Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.222. Principles of Health Science (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 9 and 10. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostics services, health informatics, support services, and biotechnology research and development.
(3) The Principles of Health Science course is designed to provide an overview of the therapeutic, diagnostic, health informatics, support services, and biotechnology research and development systems of the health care industry.
(4) To pursue a career in the health science industry, students should learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.
(5) Professional integrity in the health science industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.
(6) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(7) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas in a clear, concise, and effective manner	(i) express ideas in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employer expectations such as punctuality, attendance, time management, communication, organizational skill, and productive work habits	(i) identify employer expectations
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(A) convert units between systems of measurement	(i) convert units between systems of measurement
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(B) apply data from tables, charts, and graphs to provide solutions to health-related problems	(i) apply data from tables to provide solutions health-related problems

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(B) apply data from tables, charts, and graphs to provide solutions to health-related problems	(ii) apply data from charts to provide solutions health-related problems
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(B) apply data from tables, charts, and graphs to provide solutions to health-related problems	(iii) apply data from graphs to provide solutions health-related problems
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(C) interpret technical material related to the health science industry	(i) interpret technical material related to the health science industry
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) organize, compile, and write ideas into reports and summaries	(i) organize ideas into reports
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) organize, compile, and write ideas into reports and summaries	(ii) compile ideas into reports
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) organize, compile, and write ideas into reports and summaries	(iii) write ideas into reports
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) organize, compile and write ideas into reports and summaries	(iv) organize ideas into summaries

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) organize, compile and write ideas into reports and summaries	(v) compile ideas into summaries
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) organize, compile, and write ideas into reports and summaries	(vi) write ideas into summaries
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(E) plan and prepare effective oral presentations	(i) plan oral effective presentations
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(E) plan and prepare effective oral presentations	(ii) prepare oral effective presentations
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) formulate responses using precise language to communicate ideas	(i) formulate responses using precise language to communicate ideas
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(G) describe biological and chemical process that maintain homeostasis	(i) describe biological process that maintain homeostasis
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(G) describe biological and chemical process that maintain homeostasis	(ii) describe chemical process that maintain homeostasis

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(H) identify and analyze principles of body mechanics and movement such as forces and the effects of movement, torque, tension, and elasticity on the human body	(i) identify principles of body mechanics
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(H) identify and analyze principles of body mechanics and movement such as forces and the effects of movement, torque, tension, and elasticity on the human body	(ii) analyze principles of body mechanics
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(H) identify and analyze principles of body mechanics and movement such as forces and the effects of movement, torque, tension, and elasticity on the human body	(iii) identify principles of body movement
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(H) identify and analyze principles of body mechanics and movement such as forces and the effects of movement, torque, tension, and elasticity on the human body	(iv) analyze principles of body movement
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(I) identify human needs according to Maslow's Hierarchy of Human Needs	(i) identify human needs according to Maslow's Hierarchy of Human Needs
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(J) describe the stages of development related to the life span	(i) describe the stages of development related to the life span

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(K) identify the concepts of health and wellness throughout the life span	(i) identify the concepts of health throughout the life span
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(K) identify the concepts of health and wellness throughout the life span	(ii) identify the concepts of wellness throughout the life span
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(L) analyze and evaluate communication skills for maintaining healthy relationships throughout the life span	(i) analyze communication skills for maintaining healthy relationships throughout the life span
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(L) analyze and evaluate communication skills for maintaining healthy relationships throughout the life span	(ii) evaluate communication skills for maintaining healthy relationships throughout the life span
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(M) research the historical significance of health care	(i) research the historical significance of health care
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(N) describe the impact of health services on the economy	(i) describe the impact of health services on the economy
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(O) analyze the impact of local, state, and national government on the health science industry	(i) analyze the impact of local government on the health science industry

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(O) analyze the impact of local, state, and national government on the health science industry	(ii) analyze the impact of state government on the health science industry
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(O) analyze the impact of local, state, and national government on the health science industry	(iii) analyze the impact of national government on the health science industry
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(P) identify diverse and cultural influences that have impacted contemporary aspects of health care delivery	(i) identify diverse influences that have impacted contemporary aspects of health care delivery
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(P) identify diverse and cultural influences that have impacted contemporary aspects of health care delivery	(ii) identify cultural influences that have impacted contemporary aspects of health care delivery
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(Q) research and compare practices used by various cultures and societies to solve problems related to health	(i) research practices used by various cultures to solve problems related to health
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(Q) research and compare practices used by various cultures and societies to solve problems related to health	(ii) research practices used by various societies to solve problems related to health
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(Q) research and compare practices used by various cultures and societies to solve problems related to health	(iii) compare practices used by various cultures to solve problems related to health

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(Q) research and compare practices used by various cultures and societies to solve problems related to health	(iv) compare practices used by various societies to solve problems related to health
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(A) identify components of effective and non-effective communication	(i) identify components of effective communication
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(A) identify components of effective and non-effective communication	(ii) identify components of non-effective communication
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(B) demonstrate effective communication skills for responding to the needs of individuals in a diverse society	(i) demonstrate effective communication skills for responding to the needs of individuals in a diverse society
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(C) evaluate the effectiveness of conflict-resolution techniques in various situations	(i) evaluate the effectiveness of conflict-resolution techniques in various situations
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(D) accurately interpret, transcribe, and communicate medical vocabulary using appropriate technology	(i) accurately interpret medical vocabulary using appropriate technology
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(D) accurately interpret, transcribe, and communicate medical vocabulary using appropriate technology	(ii) accurately transcribe medical vocabulary using appropriate technology
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(D) accurately interpret, transcribe, and communicate medical vocabulary using appropriate technology	(iii) accurately communicate medical vocabulary using appropriate technology

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student implements the leadership skills necessary to function in a democratic society. The student is expected to:	(A) identify traits of a leader	(i) identify traits of a leader
(4) The student implements the leadership skills necessary to function in a democratic society. The student is expected to:	(B) demonstrate leadership skills, characteristics, and responsibilities of leaders such as goal-setting and team building	(i) demonstrate leadership skills of leaders
(4) The student implements the leadership skills necessary to function in a democratic society. The student is expected to:	(B) demonstrate leadership skills, characteristics, and responsibilities of leaders such as goal setting and team building	(ii) demonstrate characteristics of leaders
(4) The student implements the leadership skills necessary to function in a democratic society. The student is expected to:	(B) demonstrate leadership skills, characteristics, and responsibilities of leaders such as goal setting and team building	(iii) demonstrate responsibilities of leaders
(4) The student implements the leadership skills necessary to function in a democratic society. The student is expected to:	(C) demonstrate the ability to effectively conduct and participate in meetings	(i) demonstrate the ability to effectively conduct meetings
(4) The student implements the leadership skills necessary to function in a democratic society. The student is expected to:	(C) demonstrate the ability to effectively conduct and participate in meetings	(ii) demonstrate the ability to effectively participate in meetings
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(A) locate, evaluate, and interpret career options and employment information	(i) locate career options

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(A) locate, evaluate, and interpret career options and employment information	(ii) evaluate career options
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(A) locate, evaluate, and interpret career options and employment information	(iii) interpret career options
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(A) locate, evaluate, and interpret career options and employment information	(iv) locate employment information
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(A) locate, evaluate, and interpret career options and employment information	(v) evaluate employment information
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(A) locate, evaluate, and interpret career options and employment information	(vi) interpret employment information
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(B) recognize the impact of career decisions, including the causes and effects of changing employment situations	(i) recognize the impact of career decisions, including the causes of changing employment situations
(5) The student assesses career options and the preparation necessary for employment in the health science industry. The student is expected to:	(B) recognize the impact of career decisions, including the causes and effects of changing employment situations	(ii) recognize the impact of career decisions, including the effects of changing employment situations

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student identifies academic preparation and skills necessary for employment as defined by the health science industry. The student is expected to:	(A) identify academic requirements for professional advancement such as certification, licensure, registration, continuing education, and advanced degrees	(i) identify academic requirements for professional advancement
(7) The students identifies the career pathways related to health science. The student is expected to:	(A) compare health science careers within the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(i) compare health science careers within the diagnostic system
(7) The students identifies the career pathways related to health science. The student is expected to:	(A) compare health science careers within the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(ii) compare health science careers within the therapeutic system
(7) The students identifies the career pathways related to health science. The student is expected to:	(A) compare health science careers within the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(iii) compare health science careers within the health informatics system
(7) The students identifies the career pathways related to health science. The student is expected to:	(A) compare health science careers within the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(iv) compare health science careers within the support services system
(7) The students identifies the career pathways related to health science. The student is expected to:	(A) compare health science careers within the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(v) compare health science careers within the biotechnology research and development system

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The students identifies the career pathways related to health science. The student is expected to:	(B) identify the collaborative role of team members between systems to deliver quality health care	(i) identify the collaborative role of team members between systems to deliver quality health care
(8) The student examines the role of the multidisciplinary team in providing health care. The student is expected:	(A) explain the concept of teaming to provide quality health care	(i) explain the concept of teaming to provide quality health care
(8) The student examines the role of the multidisciplinary team in providing health care. The student is expected:	(B) examine the role of professional organizations in the preparation and governance of credentialing and certification	(i) examine the role of professional organizations in the preparation of credentialing
(8) The student examines the role of the multidisciplinary team in providing health care. The student is expected:	(B) examine the role of professional organizations in the preparation and governance of credentialing and certification	(ii) examine the role of professional organizations in the preparation of certification
(8) The student examines the role of the multidisciplinary team in providing health care. The student is expected:	(B) examine the role of professional organizations in the preparation and governance of credentialing and certification	(iii) examine the role of professional organizations in the governance of credentialing
(8) The student examines the role of the multidisciplinary team in providing health care. The student is expected:	(B) examine the role of professional organizations in the preparation and governance of credentialing and certification	(iv) examine the role of professional organizations in the governance of certification
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(A) compare published professional code of ethics and scope of practice	(i) compare published professional code of ethics
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(A) compare published professional code of ethics and scope of practice	(ii) compare published professional scope of practice

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(B) explain principles of ethical behavior and confidentiality, including the consequences of breach of confidentiality	(i) explain principles of ethical behavior
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(B) explain principles of ethical behavior and confidentiality, including the consequences of breach of confidentiality	(ii) explain principles of confidentiality, including the consequences of breech of confidentiality
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(C) discuss ethical issues related to health care, including implications of technological advances	(i) discuss ethical issues related to health care, including implications of technological advances
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(D) examine issues related to malpractice, negligence, and liability	(i) examine issues related to malpractice
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(D) examine issues related to malpractice, negligence, and liability	(ii) examine issues related to negligence
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(D) examine issues related to malpractice, negligence, and liability	(iii) examine issues related to liability
(9) The students interprets ethical behavior standards and legal responsibilities. The students is expected to:	(E) research laws governing the health science industry	(i) research laws governing the health science industry
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(A) identify situations related to autonomy	(i) identify situations related to autonomy
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(B) identify wellness strategies for the prevention of disease	(i) identify wellness strategies for the prevention of disease

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(C) evaluate positive and negative effects of relationships on physical and emotional health such as peers, family, and friends in promoting a healthy community	(i) evaluate positive effects of relationships on physical health
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(C) evaluate positive and negative effects of relationships on physical and emotional health such as peers, family, and friends in promoting a healthy community	(ii) evaluate negative effects of relationships on physical health
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(C) evaluate positive and negative effects of relationships on physical and emotional health such as peers, family, and friends in promoting a healthy community	(iii) evaluate positive effects of relationships on emotional health
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(C) evaluate positive and negative effects of relationships on physical and emotional health such as peers, family, and friends in promoting a healthy community	(iv) evaluate negative effects of relationships on emotional health
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(D) review documentation related to rights and choices	(D) review documentation related to rights
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(D) review documentation related to rights and choices	(D) review documentation related to choices
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(E) demonstrate an understanding of diversity and cultural practices influencing contemporary aspects of health care	(i) demonstrate an understanding of diversity influencing contemporary aspects of health care

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The students recognizes the rights of choices of the individual. The student is expected to:	(E) demonstrate an understanding of diversity and cultural practices influencing contemporary aspects of health care	(ii) demonstrate an understanding of cultural practices influencing contemporary aspects of health care
(11) The student recognizes the importance of maintaining a safe environment and eliminating hazardous situations. The student is expected to:	(A) identify governing regulatory agencies such as the World Health Organization, Centers for Disease Controland Prevention, Occupational Safety and Health Administration, Joint Commission and National Institute of Health	(i) identify governing regulatory agencies
(11) The student recognizes the importance of maintaining a safe environment and eliminating hazardous situations. The student is expected to:	(B) identify industry safety standards such as standard precautions, fire prevention and safety practices, and appropriate actions to emergency situations	(i) identify industry safety standards
(11) The student recognizes the importance of maintaining a safe environment and eliminating hazardous situations. The student is expected to:	(C) relate safety practices in all aspects of the health science industry	(i) relate safety practices in all aspects of the health science industry
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(i) research technological equipment used in the diagnostic system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(ii) research technological equipment used in the therapeutic system

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(iii) research technological equipment used in the health informatics systems
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(iv) research technological equipment used in the support services system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(v) research technological equipment used in the biotechnology research and development system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(vi) identify technological equipment used in the diagnostic system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(vii) identify technological equipment used in the therapeutic system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(viii) identify technological equipment used in the health informatics system

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(ix) identify technological equipment used in the support services system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(A) research and identify technological equipment used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems	(x) identify technological equipment used in the biotechnology research and development system
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(B) identify potential malfunctions of technological equipment	(i) identify potential malfunctions of technological equipment
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(C) recognize and explain the process for reporting equipment or technology malfunctions	(i) recognize the process for reporting equipment or technology malfunctions
(12) The students identifies the technology used in the diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems. The student is expected to:	(C) recognize and explain the process for reporting equipment or technology malfunctions	(ii) explain the process for reporting equipment or technology malfunctions

Subject	**Chapter 130. Career and Technical Education,Subchapter H. Health Science**
Course Title	**§130.223. Medical Terminology (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grade 9-12.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostics services, health informatics, support services, and biotechnology research and development.
(3) The Medical Terminology course is designed to introduce students to the structure of medical terms, including prefixes, suffixes, word roots, singular and plural forms, and medical abbreviations. The course allows students to achieve comprehension of medical vocabulary appropriate to medical procedures, human anatomy and physiology, and pathophysiology.
(4) To pursue a career in the health science industry, students should learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.
(5) The health science industry is comprised of diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems that function individually and collaboratively to provide comprehensive health care. Students should identify the employment opportunities, technology, and safety requirements of each system. Students are expected to learn the knowledge and skills necessary to pursue a health science career through further education and employment.
(6) Professional integrity in the health science industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.
(7) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(8) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(A) express ideas in a clear, concise, and effective manner	(i) express ideas in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(A) identify abbreviations, acronyms, and symbols related to the health science industry	(i) identify abbreviations related to the health science industry
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(A) identify abbreviations, acronyms, and symbols related to the health science industry	(ii) identify acronyms related to the health science industry
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(A) identify abbreviations, acronyms, and symbols related to the health science industry	(iii) identify symbols related to the health science industry
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(B) identify the basic structures of medical words	(i) identify the basic structures of medical words

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(C) practice word-building skills	(i) practice word-building skills
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(D) research the origins of eponyms	(i) research the origins of eponyms
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(E) recall directional terms and anatomical planes related to body structure	(i) recall directional terms related to body structure
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(E) recall directional terms and anatomical planes related to body structure	(ii) recall anatomical planes related to the body structure
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatment	(i) define occupationally specific terms
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatment	(ii) accurately spell occupationally specific terms
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(G) use prior knowledge and experiences to understand the meaning of terms as they relate to the health science industry	(i) use prior knowledge to understand the meaning of terms as they relate to the health science industry
(2) The student recognizes the terminology related to the health science industry. The student is expected to:	(G) use prior knowledge and experiences to understand the meaning of terms as they relate to the health science industry	(ii) use experiences to understand the meaning of terms as they relate to the health science industry

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student demonstrates communication skills using the terminology applicable to the health science industry. The student is expected to:	(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios	(i) demonstrate appropriate verbal strategies
(3) The student demonstrates communication skills using the terminology applicable to the health science industry. The student is expected to:	(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios	(ii) demonstrate appropriate written strategies
(3) The student demonstrates communication skills using the terminology applicable to the health science industry. The student is expected to:	(B) employ increasingly precise language to communicate	(i) employ increasingly precise language to communicate
(3) The student demonstrates communication skills using the terminology applicable to the health science industry. The student is expected to:	(C) translate technical material related to the health science industry	(i) translate technical material related to the health science industry
(4) The student examines available resources. The student is expected to:	(A) examine medical and dental dictionaries and multimedia resources	(i) examine medical dictionaries
(4) The student examines available resources. The student is expected to:	(A) examine medical and dental dictionaries and multimedia resources	(ii) examine dental dictionaries
(4) The student examines available resources. The student is expected to:	(A) examine medical and dental dictionaries and multimedia resources	(iii) examine medical multimedia resources
(4) The student examines available resources. The student is expected to:	(A) examine medical and dental dictionaries and multimedia resources	(iv) examine dental multimedia resources

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student examines available resources. The student is expected to:	(B) integrate resources to interpret technical materials	(i) integrate resources to interpret technical materials
(4) The student examines available resources. The student is expected to:	(C) investigate electronic media with appropriate supervision	(i) investigate electronic media with appropriate supervision
(5) The student interprets medical abbreviations. The student is expected to:	(A) distinguish medical abbreviations used throughout the health science industry	(i) distinguish medical abbreviations used throughout the health science industry
(5) The student interprets medical abbreviations. The student is expected to:	(B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports	(i) translate medical abbreviations in simulated technical material
(6) The student appropriately translates health science industry terms. The student is expected to:	(A) interpret, transcribe, and communicate vocabulary related to the health science industry	(i) interpret vocabulary related to the health science industry
(6) The student appropriately translates health science industry terms. The student is expected to:	(A) interpret, transcribe, and communicate vocabulary related to the health science industry	(ii) translate vocabulary related to the health science industry
(6) The student appropriately translates health science industry terms. The student is expected to:	(A) interpret, transcribe, and communicate vocabulary related to the health science industry	(iii) communicate vocabulary related to the health science industry
(6) The student appropriately translates health science industry terms. The student is expected to:	(B) translate medical terms to conversational language to facilitate communication	(i) translate medical terms to conversational language to facilitate communication
(6) The student appropriately translates health science industry terms. The student is expected to:	(C) distinguish medical terminology associated with medical specialists such as geneticists, pathologists, and oncologists	(i) distinguish medical terminology associated with medical specialists

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student appropriately translates health science industry terms. The student is expected to:	(D) summarize observations using medial terminology	(i) summarize observations using medial terminology
(6) The student appropriately translates health science industry terms. The student is expected to:	(E) interpret contents of medical scenarios correctly	(i) interpret contents of medical scenarios correctly

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.224. Anatomy and Physiology (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 10-12. Prerequisite: two science credits. Recommended prerequisite: a course from the Health Science Career Cluster. Students must meet the 40% laboratory and fieldwork requirement. This course satisfies a high school science graduation requirement. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Anatomy and Physiology course is designed for students to conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Anatomy and Physiology will study a variety of topics, including the structure and function of the human body and the interaction of body systems for maintaining homeostasis.
(4) Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.
(5) Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation are experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.
(6) Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information).
(7) A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.
(8) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(9) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communications in a clear, concise, and effective manner	(i) demonstrate verbal communications in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communications in a clear, concise, and effective manner	(ii) demonstrate non-verbal communications in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team.	(i) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skill as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student conducts investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations	(i) demonstrate safe practices during laboratory investigations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student conducts investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations	(ii) demonstrate safe practices during field investigations
(2) The student conducts investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(i) demonstrate an understanding of the use of resources
(2) The student conducts investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(ii) demonstrate an understanding of the conservation of resources

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student conducts investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(ii) demonstrate an understanding of the proper disposal or recycling of materials
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section	(i) know the definition of science as specified in subsection (b)(4) [above]
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section	(ii) understand that [science] has limitations, as specified in subsection (b)(4) [above]
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(i) know that hypotheses are tentative statements that must be capable of being supported or not supported by observational evidence
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(ii) know that hypotheses are testable statements that must be capable of being supported or not supported by observational evidence

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(iii) [know that] hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(i) know [that] scientific theories are based on natural and physical phenomena
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(ii) know [that] scientific theories are capable of being tested by multiple independent researchers
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(iii) [know that] unlike hypotheses, scientific theories are well-established explanations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(iv) [know that], unlike hypotheses, scientific theories are highly-reliable explanations
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(D) distinguish between scientific hypotheses and theories	(i) distinguish between scientific hypotheses and theories
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(i) plan descriptive investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(ii) plan descriptive investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(iii) plan descriptive investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(iv) implement descriptive investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(v) implement descriptive investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(vi) implement descriptive investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(vii) plan comparative investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(viii) plan comparative investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(ix) plan comparative investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(x) plan comparative investigations, including selecting technology

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xi) implement comparative investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xii) implement comparative investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xiii) implement comparative investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xiv) implement comparative investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xv) plan experimental investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xvi) plan experimental investigations, including formulating testable hypotheses

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xvii) plan experimental investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xviii) plan experimental investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xix) implement experimental investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xx) implement experimental investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xxi) implement experimental investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xxii) implement experimental investigations, including selecting technology

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(i) collect qualitative data using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(ii) organize qualitative data using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(iii) collect quantitative data using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(iv) organize quantitative data using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(v) make measurements with accuracy using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(vi) make measurements with precision using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(i) analyze data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(ii) evaluate data

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(iii) make inferences from data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(iv) predict trends from data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports	(i) communicate valid conclusions supported by the data through [various] methods
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(ii) in all fields of science, analyze scientific explanations by using logical reasoning
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(iii) in all fields of science, analyze scientific explanations by using experimental testing

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(iv) in all fields of science, analyze scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(v) in all fields of science, analyze scientific explanations, including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(vi) in all fields of science, evaluate scientific explanations by using empirical evidence
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(vii) in all fields of science, evaluate scientific explanations by using logical reasoning

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(viii) in all fields of science, evaluate scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(ix) in all fields of science, evaluate scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(x) in all fields of science, evaluate scientific explanations, including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xi) in all fields of science, critique scientific explanations by using empirical evidence

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xii) in all fields of science, critique scientific explanations by using logical reasoning
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xiii) in all fields of science, critique scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xiv) in all fields of science, critique scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xv) in all fields of science, critique scientific explanations, including examining all sides of scientific evidence of those scientific explanations

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student	(xv) in all fields of science, critique scientific explanations, including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials	(i) communicate scientific information extracted from various sources
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials	(ii) apply scientific information extracted from various sources
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(C) draw inferences based on data related to promotional materials for products and services	(i) draw inferences based on data related to promotional materials for products
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(C) draw inferences based on data related to promotional materials for products and services	(ii) draw inferences based on data related to promotional materials for services

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(D) evaluate the impact of scientific research on society and the environment	(i) evaluate the impact of scientific research on society
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(D) evaluate the impact of scientific research on society and the environment	(ii) evaluate the impact of scientific research on the environment
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(E) evaluate models according to their limitations in representing biological objects or events	(i) evaluate models according to their limitations in representing biological objects or events
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(i) research the history of science
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(ii) research contributions of scientists
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(iii) describe the history of science

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(iv) describe the contributions of scientists
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(A) analyze the chemical reactions that provide energy for the body	(i) analyze the chemical reactions that provide energy for the body
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(B) evaluate the modes, including the structure and function of the digestive system, by which energy is processed and stored within the body	(i) evaluate the modes, including the structure of the digestive system, by which energy is processed within the body
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(B) evaluate the modes, including the structure and function of the digestive system, by which energy is processed and stored within the body	(ii) evaluate the modes, including the structure of the digestive system, by which energy is stored within the body
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(B) evaluate the modes, including the structure and function of the digestive system, by which energy is processed and stored within the body	(iii) evaluate the modes, including the function of the digestive system, by which energy is processed within the body
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(B) evaluate the modes, including the structure and function of the digestive system, by which energy is processed and stored within the body	(iv) evaluate the modes, including the function of the digestive system, by which energy is stored within the body
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(C) analyze the effects of energy deficiencies in malabsorption disorders as they relate to body systems such as Crohn's disease and Cystic fibrosis	(i) analyze the effects of energy deficiencies in malabsorption disorders as they relate to body systems

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student evaluates the energy needs of the human body and the processes through which these needs are fulfilled. The student is expected to:	(D) analyze the effects of energy excess in disorders as they relate to body systems such as cardiovascular, endocrine, musculoskeletal, and pulmonary	(i) analyze the effects of energy excess in disorders as they relate to body systems
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(A) explain the coordination of muscles, bones, and joints that allows movement of the body	(i) explain the coordination of muscles, bones, and joints that allows movement of the body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(B) investigate and report the uses of various diagnostic and therapeutic technologies	(i) investigate the uses of various diagnostic technologies
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(B) investigate and report the uses of various diagnostic and therapeutic technologies	(ii) investigate the uses of various therapeutic technologies
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(B) investigate and report the uses of various diagnostic and therapeutic technologies	(iii) report the uses of various diagnostic technologies
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(B) investigate and report the uses of various diagnostic and therapeutic technologies	(iv) report the uses of various therapeutic technologies
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(C) interpret normal and abnormal contractility conditions such as in edema, glaucoma, aneurysms, and hemorrhage	(i) interpret normal contractility conditions

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(C) interpret normal and abnormal contractility conditions such as in edema, glaucoma, aneurysms, and hemorrhage	(ii) interpret abnormal contractility conditions
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(i) analyze the effects of pressure on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(ii) analyze the effects of movement on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(iii) analyze the effects of torque on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(iv) analyze the effects of tension on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(v) analyze the effects of elasticity on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(vi) describe the effects of pressure on the human body

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(vii) describe the effects of movement on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(viii) describe the effects of torque on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(ix) describe the effects of tension on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(D) analyze and describe the effects of pressure, movement, torque, tension, and elasticity on the human body	(x) describe the effects of elasticity on the human body
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(E) perform an investigation to determine causes and effects of force variance and communicate findings	(i) perform an investigation to determine causes of force variance and communicate findings
(6) The student differentiates the responses of the human body to internal and external forces. The student is expected to:	(E) perform an investigation to determine causes and effects of force variance and communicate findings	(ii) perform an investigation to determine effects of force variance and communicate findings
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(i) investigate the integration of the chemical and physical processes, including equilibrium that contribute to homeostasis

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(ii) investigate the integration of the chemical and physical processes, including temperature that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(iii) investigate the integration of the chemical and physical processes, including pH balance that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(iv) investigate the integration of the chemical and physical processes, including chemical reactions that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(v) investigate the integration of the chemical and physical processes, including passive transport that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(vi) investigate the integration of the chemical and physical processes, including active transport that contribute to homeostasis

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(vii) investigate the integration of the chemical and physical processes, including biofeedback that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(viii) describe the integration of the chemical and physical processes, including equilibrium that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(ix) describe the integration of the chemical and physical processes, including temperature that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(x) describe the integration of the chemical and physical processes, including pH balance that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(xi) describe the integration of the chemical and physical processes, including chemical reactions that contribute to homeostasis

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(xii) describe the integration of the chemical and physical processes, including passive transport that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(xiii) describe the integration of the chemical and physical processes, including passive transport that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(xiv) describe the integration of the chemical and physical processes, including active transport that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(A) investigate and describe the integration of the chemical and physical processes, including equilibrium, temperature, pH balance, chemical reactions, passive transport, active transport, and biofeedback, that contribute to homeostasis	(xv) describe the integration of the chemical and physical processes, including biofeedback that contribute to homeostasis
(7) The student examines the body processes that maintain homeostasis. The student is expected to:	(B) determine the consequences of the failure to maintain homeostasis	(i) determine the consequences of the failure to maintain homeostasis
(8) The student examines the electrical conduction processes and interactions. The student is expected to:	(A) illustrate conduction systems such as nerve transmission or muscle stimulation	(i) illustrate conduction systems

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student examines the electrical conduction processes and interactions. The student is expected to:	(B) investigate the therapeutic uses and effects of external sources of electricity on the body system	(i) investigate the therapeutic uses of external sources of electricity on the body system
(8) The student examines the electrical conduction processes and interactions. The student is expected to:	(B) investigate the therapeutic uses and effects of external sources of electricity on the body system	(ii) investigate the therapeutic effects of external sources of electricity on the body system
(8) The student examines the electrical conduction processes and interactions. The student is expected to:	(C) evaluate the application of advanced technologies such as electroencephalogram, electrocardiogram, bionics, transcutaneous electrical nerve stimulation, and cardioversion	(i) evaluate the application of advanced technologies
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(i) analyze the physical properties of transport systems, including circulatory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(ii) analyze the physical properties of transport systems, including respiratory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(iii) analyze the physical properties of transport systems, including excretory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(iv) analyze the chemical properties of transport systems, including circulatory

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(v) analyze the chemical properties of transport systems, including respiratory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(vi) analyze the chemical properties of transport systems, including excretory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(vii) analyze the biological properties of transport systems, including circulatory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(viii) analyze the biological properties of transport systems, including respiratory
(9) The student explores the body's transport systems. The student is expected to:	(A) analyze the physical, chemical, and biological properties of transport systems, including circulatory, respiratory, and excretory	(ix) analyze the biological properties of transport systems, including excretory
(9) The student explores the body's transport systems. The student is expected to:	(B) determine the factors that alter the normal functions of transport systems	(i) determine the factors that alter the normal functions of transport systems
(9) The student explores the body's transport systems. The student is expected to:	(C) contrast the interactions among the transport systems	(i) contrast the interactions among the transport systems

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student investigates environmental factors that affect the human body. The student is expected to:	(A) identify the effects of environmental factors such as climate, pollution, radioactivity, chemicals, electromagnetic fields, pathogens, carcinogens, and drugs on body systems	(i) identify the effects of environmental factors on body systems
(10) The student investigates environmental factors that affect the human body. The student is expected to:	(B) explore measures to minimize harmful environmental factors on body systems	(i) explore measures to minimize harmful environmental factors on body systems
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(i) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(ii) analyze the relationships between the anatomical structures and physiological functions of systems, including the nervous [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(iii) analyze the relationships between the anatomical structures and physiological functions of systems, including the skeletal [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(iv) analyze the relationships between the anatomical structures and physiological functions of systems, including muscular [system]

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(v) analyze the relationships between the anatomical structures and physiological functions of systems, including cardiovascular [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(vi) analyze the relationships between the anatomical structures and physiological functions of systems, including respiratory [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(vii) analyze the relationships between the anatomical structures and physiological functions of systems, including digestive [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(viii) analyze the relationships between the anatomical structures and physiological functions of systems, including urinary [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(ix) analyze the relationships between the anatomical structures and physiological functions of systems, including immune systems

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(x) analyze the relationships between the anatomical structures and physiological functions of systems, including endocrine [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(A) analyze the relationships between the anatomical structures and physiological functions of systems, including the integumentary, nervous, skeletal, muscular, cardiovascular, respiratory, digestive, urinary, immune, endocrine, and reproductive systems	(xi) analyze the relationships between the anatomical structures and physiological functions of systems, including reproductive [system]
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(i) evaluate the cause and effect of disease on the structure of cells
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(ii) evaluate the cause and effect of disease on the structure of tissues
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(iii) evaluate the cause and effect of disease on the structure of organs
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(iv) evaluate the cause and effect of disease on the structure of systems

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(v) evaluate the cause and effect of trauma on the structure of cells
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(vi) evaluate the cause and effect of trauma on the structure of tissues
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(vii) evaluate the cause and effect of trauma on the structure of organs
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(viii) evaluate the cause and effect of trauma on the structure of systems
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(ix) evaluate the cause and effect of congenital defects on the structure of cells
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(x) evaluate the cause and effect of congenital defects on the structure of tissues
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xi) evaluate the cause and effect of congenital defects on the structure of organs

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xii) evaluate the cause and effect of congenital defects on the structure of systems
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xiii) evaluate the cause and effect of disease on the function of cells
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xiv) evaluate the cause and effect of disease on the function of tissues
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xv) evaluate the cause and effect of disease on the function of organs
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xvi) evaluate the cause and effect of disease on the function of systems
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xvii) evaluate the cause and effect of trauma on the function of cells
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xviii) evaluate the cause and effect of trauma on the function of tissues

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xix) evaluate the cause and effect of trauma on the function of organs
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xx) evaluate the cause and effect of trauma on the function of systems
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xxi) evaluate the cause and effect of congenital defects on the function of cells
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xxii) evaluate the cause and effect of congenital defects on the function of tissues
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xxiii) evaluate the cause and effect of congenital defects on the function of organs
(11) The student investigates structure and function of the human body. The student is expected to:	(B) evaluate the cause and effect of disease, trauma, and congenital defects on the structure and function of cells, tissues, organs, and systems	(xxiv) evaluate the cause and effect of congenital defects on the function of systems
(11) The student investigates structure and function of the human body. The student is expected to:	(C) research technological advances and limitations in the treatment of system disorders	(i) research technological advances in the treatment of system disorders
(11) The student investigates structure and function of the human body. The student is expected to:	(C) research technological advances and limitations in the treatment of system disorders	(ii) research technological limitations in the treatment of system disorders

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student investigates structure and function of the human body The student is expected to:	(D) examine characteristics of the aging process on body systems	(i) examine characteristics of the aging process on body systems
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(A) explain embryological development of cells, tissues, organs, and systems	(i) explain embryological development of cells
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(A) explain embryological development of cells, tissues, organs, and systems	(ii) explain embryological development of tissues
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(A) explain embryological development of cells, tissues, organs, and systems	(iii) explain embryological development of organs
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(A) explain embryological development of cells, tissues, organs, and systems	(iv) explain embryological development of systems
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(B) identify the functions of the male and female reproductive systems	(i) identify the functions of the male reproductive system
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(B) identify the functions of the male and female reproductive systems	(ii) identify the functions of the female reproductive system

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student describes the process of reproduction and growth and development. The student is expected to:	(C) summarize the human growth and development cycle	(i) summarize the human growth and development cycle
(13) The student recognizes emerging technological advances in science. The student is expected to:	(A) recognize advances in stem cell research such as cord blood use	(i) recognize advances in stem cell research
(13) The student recognizes emerging technological advances in science. The student is expected to:	(B) recognize advances in bioengineering and transplant technology	(i) recognize advances in bioengineering technology
(13) The student recognizes emerging technological advances in science. The student is expected to:	(B) recognize advances in bioengineering and transplant technology	(ii) recognize advances in transplant technology

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.225. Medical Microbiology (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 10-12. Prerequisites: Biology and Chemistry. Recommended prerequisite: a course from the Health Science Career Cluster. Students must meet the 40% laboratory and fieldwork requirement. This course satisfies a high school science graduation requirement. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Medical Microbiology course is designed to explore the microbial world, studying topics such as pathogenic and non-pathogenic microorganisms, laboratory procedures, identifying microorganisms, drug resistant organisms, and emerging diseases.
(4) Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.
(5) Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation are experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.
(6) Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information).
(7) A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.
(8) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(9) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is+A9:C12 expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(i) demonstrate verbal communication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. These invesitations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment environment as well as field observations that extend beyond the classroom. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations	(i) demonstrate safe practices during laboratory investigations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. These invesitations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment environment as well as field observations that extend beyond the classroom. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations	(ii) demonstrate safe practices during field investigations
(2) The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. These invesitations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(i) demonstrate an understanding of the use of resources
(2) The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. These invesitations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(ii) demonstrate an understanding of the conservation of resources

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices. These invesitations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(iii) demonstrate an understanding of the proper disposal or recycling of materials
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section	(i) know the definition of science, as specified in subsection (b)(4) [above]
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section	(ii) understand that [science] has limitations, as specified in subsection (b)(4) [above]
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(i) know that hypotheses are tentative statements that must be capable of being supported or not supported by observational evidence
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(ii) know that hypotheses are testable statements that must be capable of being supported or not supported by observational evidence

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(iii) [know that] hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(i) know that scientific theories are based on natural and physical phenomena
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(ii) know that scientific theories are capable of being tested by multiple independent researchers
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(iii) [know that] unlike hypotheses, scientific theories are well-established explanations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(iv) [know that], unlike hypotheses, scientific theories are highly-reliable explanations
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(v) [know that] scientific theories may be subject to change as new areas of science are created
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(vi) [know that] scientific theories may be subject to change as new technologies emerge
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(D) distinguish between scientific hypotheses and scientific theories	(i) distinguish between scientific hypotheses and scientific theories
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(i) plan descriptive investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(ii) plan descriptive investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(iii) plan descriptive investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(iv) implement descriptive investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(v) implement descriptive investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(vi) implement descriptive investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(vii) plan comparative investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(viii) plan comparative investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(ix) plan comparative investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(x) plan comparative investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xi) implement comparative investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xii) implement comparative investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xiii) implement comparative investigations, including selecting equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xiv) implement comparative investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xv) plan experimental investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xvi) plan experimental investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xvii) plan experimental investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xviii) plan experimental investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xix) implement experimental investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xx) implement experimental investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xxi) implement experimental investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xxii) implement experimental investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(i) collect qualitative data using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(ii) organize qualitative data using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(iii) collect quantitative data using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(iv) organize quantitative data using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(v) make measurements with accuracy using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(vi) make measurements with precision using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(i) analyze data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(ii) evaluate data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(iii) make inferences from data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(iv) predict trends from data

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports	(i) communicate valid conclusions supported by the data through [various] methods
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(I) dispose of all biological material in the proper biohazard containers	(i) dispose of all biological material in the proper biohazard containers
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(J) employ standard precautions, including proper protective equipment during all laboratory exercises	(i) employ standard precautions, including proper protective equipment during all laboratory exercises
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(i) in all fields of science, analyze scientific explanations by using empirical evidence
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(ii) in all fields of science, analyze scientific explanations by using logical reasoning

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(iii) in all fields of science, analyze scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(iv) in all fields of science, analyze scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(v) in all fields of science, analyze scientific explanations, including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(vi) in all fields of science, evaluate scientific explanations by using empirical evidence

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(vii) in all fields of science, evaluate scientific explanations by using logical reasoning
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(viii) in all fields of science, evaluate scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(ix) in all fields of science, evaluate scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(x) in all fields of science, evaluate scientific explanations, including examining all sides of scientific evidence of those scientific explanations

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xi) in all fields of science, critique scientific explanations by using empirical evidence
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xii) in all fields of science, critique scientific explanations by using logical reasoning
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xiii) in all fields of science, critique scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xiv) in all fields of science, critique scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xv) in all fields of science, critique scientific explanations, including examining all sides of scientific evidence of those scientific explanations

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials	(i) communicate scientific information extracted from various sources
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials	(ii) apply scientific information extracted from various sources
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(C) draw inferences based on data related to promotional materials for products and services	(i) draw inferences based on data related to promotional materials for products
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(C) draw inferences based on data related to promotional materials for products and services	(ii) draw inferences based on data related to promotional materials for services
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(D) evaluate the impact of scientific research on society and the environment	(i) evaluate the impact of scientific research on society
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(D) evaluate the impact of scientific research on society and the environment	(ii) evaluate the impact of scientific research on the environment

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(E) evaluate models according to their limitations in representing biological objects or events	(i) evaluate models according to their limitations in representing biological objects or events
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(i) research the history of science
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(ii) research contributions of scientists
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(iii) describe the history of science
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(iv) describe the contributions of scientists
(5) The student describes the relationships between microorganisms and health and wellness in the human body. The student is expected to:	(A) research and describe the historical development of microbiology as it relates to health care of an individual	(i) research the historical development of microbiology as it relate to health care of an individual
(5) The student describes the relationships between microorganisms and health and wellness in the human body. The student is expected to:	(A) research and describe the historical development of microbiology as it relates to health care of an individual	(ii) describe the historical development of microbiology as it relates to health care of an individual

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student describes the relationships between microorganisms and health and wellness in the human body. The student is expected to:	(B) research roles, functions, and responsibilities of agencies governing infectious disease control	(i) research roles of agencies governing infectious disease control
(5) The student describes the relationships between microorganisms and health and wellness in the human body. The student is expected to:	(B) research roles, functions, and responsibilities of agencies governing infectious disease control	(ii) research functions of agencies governing infectious disease control
(5) The student describes the relationships between microorganisms and health and wellness in the human body. The student is expected to:	(B) research roles, functions, and responsibilities of agencies governing infectious disease control	(iii) research responsibilities of agencies governing infectious disease control
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(A) classify microorganisms using a dichotomous key	(i) classify microorganisms using a dichotomous key
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(B) explain the difference between Gram positive and Gram negative bacteria regarding the bacterial cell wall	(i) explain the difference between Gram positive and Gram negative bacteria regarding the bacterial cell wall
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(C) identify chemical processes of microorganisms	(i) identify chemical processes of microorganisms
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(D) recognize the factors required for microbial reproduction and growth	(i) recognize the factors required for microbial reproduction

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(D) recognize the factors required for microbial reproduction and growth	(ii) recognize the factors required for microbial growth
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(E) identify the normal flora microorganisms of the human body	(i) identify the normal flora microorganisms of the human body
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(F) distinguish between pathogens, opportunistic pathogens, hospital-acquired infections, and colonizing microorganisms	(i) distinguish between pathogens
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(F) distinguish between pathogens, opportunistic pathogens, hospital-acquired infections, and colonizing microorganisms	(ii) distinguish between opportunistic pathogens
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(F) distinguish between pathogens, opportunistic pathogens, hospital-acquired infections, and colonizing microorganisms	(iii) distinguish between hospital-acquired infections
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(F) distinguish between pathogens, opportunistic pathogens, hospital-acquired infections, and colonizing microorganisms	(iv) distinguish between colonizing microorganisms
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(G) describe the colony morphology of microorganisms	(i) describe the colony morphology of microorganisms

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(H) interpret Gram stains results	(i) interpret Gram stains results
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(I) discuss the results of laboratory procedures such as biochemical reactions that are used to identify microorganisms	(i) discuss the results of laboratory procedures
(6) The student is expected to perform and analyze results in the microbiology laboratory. The student is expected to:	(J) explain the role of the sensitivity report provided to the clinician by the microbiology department	(i) explain the role of the sensitivity report provided to the clinician by the microbiology department
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(A) outline the infectious process, including how pathogenic microorganisms affect human body systems	(i) outline the infectious process, including how pathogenic microorganisms affect human body systems
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(i) categorize diseases caused by bacteria
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(ii) categorize diseases caused by fungi
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(iii) categorize diseases caused by viruses
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(iv) categorize diseases caused by protozoa

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(v) categorize diseases caused by rickettsias
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(vi) categorize diseases caused by arthropods
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(B) categorize diseases caused by bacteria, fungi, viruses, protozoa, rickettsias, arthropods, and helminths	(vii) categorize diseases caused by helminths
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(C) explain the body's immune response and defenses against infection	(i) explain the body's immune response against infection
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(C) explain the body's immune response and defenses against infection	(ii) explain the body's immune defenses against infection
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(D) evaluate the effects of anti-microbial agents such as narrow and broad spectrum antibiotics	(i) evaluate the effects of anti-microbial agents
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(E) examine reemergence of diseases such as malaria, tuberculosis, and polio	(i) examine reemergence of diseases
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(F) identify common bacterial infections from hospital-acquired infection and community-acquired infections such as Clostridium difficile and Staphylococcus aureus;	(i) identify common bacterial infections from hospital-acquired infection
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(F) identify common bacterial infections from hospital-acquired infection and community-acquired infections such as Clostridium difficile and Staphylococcus aureus;	(ii) identify common bacterial infections from community-acquired infection

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(G) investigate drug-resistant microorganisms such as carbapenem-resistant Enterobacteriaceae, methicillin-resistant Staphylococcus aureus, vancomycin-intermediate/resistant Staphylococci aureus, vancomycin-resistant enterococci, and emergent antibiotic-resistant superbugs	(G) investigate drug-resistant microorganisms
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(H) outline the role of the governing agencies in monitoring and establishing guidelines based on the spread of infectious diseases	(i) outline the role of the governing agencies in monitoring guidelines based on the spread of infectious diseases
(7) The student examines the role of microorganisms in infectious diseases. The student is expected to:	(H) outline the role of the governing agencies in monitoring and establishing guidelines based on the spread of infectious diseases	(ii) outline the role of the governing agencies in establishing guidelines based on the spread of infectious diseases

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.226. World Health Research (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: a course in the Health Science Career Cluster, Biology, and Chemistry. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The World Health Research course is designed to examine major world health problems and emerging technologies as solutions to these medical concerns. It is designed to improve students' understanding of the cultural, infrastructural, political, educational, and technological constraints and inspire ideas for appropriate technological solutions to global medical care issues.
(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(i) demonstrate verbal communication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(A) describe the pathophysiology of the three leading causes of death in developing and developed countries	(i) describe the pathophysiology of the three leading causes of death in developing countries
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(A) describe the pathophysiology of the three leading causes of death in developing and developed countries	(ii) describe the pathophysiology of the three leading causes of death in developed countries

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(B) discuss history of diseases and the evolution of medical technology over time	(i) discuss the history of disease
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(B) discuss history of diseases and the evolution of medical technology over time	(ii) discuss the evolution of medical technology over time
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(C) contrast health problems in developing and developed countries	(i) contrast health problems in developing and developed countries
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(D) describe the function of the World Health Organization	(i) descibe the functionof the world heatlh organization
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(E) define and calculate incidence, morbidity, and mortality	(i) define incidence
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(E) define and calculate incidence, morbidity, and mortality	(ii) define morbidity
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(E) define and calculate incidence, morbidity, and mortality	(iii) define mortality

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(E) define and calculate incidence, morbidity, and mortality	(iv) calculate incidence
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(E) define and calculate incidence, morbidity, and mortality	(v) calculate morbidity
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(E) define and calculate incidence, morbidity, and mortality	(vi) calculate mortality
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(F) identify and describe the challenges in global health that can have the greatest impact on health in developing nations	(i) identify the challenges in global health that can have the greatest impact on health in developing nations
(2) The student explores and discusses current major human health problems in the world. The student is expected to:	(F) identify and describe the challenges in global health that can have the greatest impact on health in developing nations	(ii) describe the challenges in global health that can have the greatest impact on health in developing nations
(3) The student explains who pays for health care in the world today. The student is expected to:	(A) compare the availability of health care in developed and developing countries	(i) compare the availabitily of health care in developed and developing countries
(3) The student explains who pays for health care in the world today. The student is expected to:	(B) discuss and contrast the four basic health care system models including the Beveridge Model, Bismarck Model, National Health Insurance Model, and the Out-of-Pocket Model	(i) discuss the four basic health care system models including the Beveridge Model, Bismarck Model, National Health Insurance Model, and the Out-of-Pocket Model

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student explains who pays for health care in the world today. The student is expected to:	(B) discuss and contrast the four basic health care system models including the Beveridge Model, Bismarck Model, National Health Insurance Model, and the Out-of-Pocket Model	(ii) contrast the four basic health care system models including the Beveridge Model, Bismarck Model, National Health Insurance Model, and the Out-of-Pocket Model
(3) The student explains who pays for health care in the world today. The student is expected to:	(C) explain how countries such as the United Kingdom, Japan, Germany, Taiwan, Switzerland, and the United States of America pay for health care	(i) explain how countries pay for health care
(3) The student explains who pays for health care in the world today. The student is expected to:	(D) describe how health care expenditures have changed over time	(i) describe how health care expenditures have changed over time
(3) The student explains who pays for health care in the world today. The student is expected to:	(E) identify the major contributors to the rising health science industry costs	(i) identify the major contributors to the rising health science industry costs
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(A) describe technologies that support the prevention and treatment of infectious diseases	(i) describe technologies that support the prevention of infectious diseases
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(A) describe technologies that support the prevention and treatment of infectious diseases	(ii) describe technologies that support the treatment of infectious diseases
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(B) explain the implication of vaccines on the immune system	(i) explain the implication of vaccines on the immune system

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(C) investigate technologies used for the early detection of cancer	(i) investigate technologies used for the early detection of cancer
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(D) investigate technologies used for the treatment of several different types of cancers	(i) investigate technologies used for the treatment of several different types of cancers
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(E) explain the cardiovascular system and the technologies used in the diagnosis and treatment of heart disease	(i) explain the cardiovascular system
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(E) explain the cardiovascular system and the technologies used in the diagnosis and treatment of heart disease	(ii) explain the technologies used in the diagnosis of heart disease
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(E) explain the cardiovascular system and the technologies used in the diagnosis and treatment of heart disease	(iii) explain the technologies used in the treatment of heart disease
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(F) describe and discuss technologies developed to support vital organ failure	(i) describe technologies developed to support vital organ failure
(4) The student describes the engineering technologies developed to address clinical needs. The student is expected to:	(F) describe and discuss technologies developed to support vital organ failure	(ii) discuss technologies developed to support vital organ failure

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student explores how human clinical trials are designed, conducted, and evaluated. The student is expected to:	(A) identify types of clinical trials	(i) identify types of clinical trials
(5) The student explores how human clinical trials are designed, conducted, and evaluated. The student is expected to:	(B) define and calculate a sample size	(i) define sample size
(5) The student explores how human clinical trials are designed, conducted, and evaluated. The student is expected to:	(B) define and calculate a sample size	(ii) calculate sample size
(5) The student explores how human clinical trials are designed, conducted, and evaluated. The student is expected to:	(C) analyze quantitative methods used to describe clinical trials	(i) analyze quantitative methods used to describe clinical trials
(6) The student recognizes the ethics involved in clinical research. The student is expected to:	(A) define informed consent	(i) define informed consent
(6) The student recognizes the ethics involved in clinical research. The student is expected to:	(B) explain who can give informed consent	(i) explain who can give informed consent
(6) The student recognizes the ethics involved in clinical research. The student is expected to:	(C) identify issues in research that influence the development of ethical principles and legal requirements currently governing research with human subjects	(i) identify issues in research that influence the development of ethical principles

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student recognizes the ethics involved in clinical research. The student is expected to:	(C) identify issues in research that influence the development of ethical principles and legal requirements currently governing research with human subjects	(ii) Identify issues in research that influence the development of legal requirements currently governing research with human subjects
(6) The student recognizes the ethics involved in clinical research. The student is expected to:	(D) explain the ethical guidelines for the conduct of research involving human subjects	(i) explain the ethical guidelines for the conduct of research involving human subjects
(7) The student explains how medical technologies are managed. The student is expected to:	(A) describe how health science research is funded	(i) describe how health science research is funded
(7) The student explains how medical technologies are managed. The student is expected to:	(B) explain the role of the Food and Drug Administration in approving new drugs and medical devices	(i) explain the role of the Food and Drug administration in approving new drugs
(7) The student explains how medical technologies are managed. The student is expected to:	(B) explain the role of the Food and Drug Administration in approving new drugs and medical devices	(ii) explain the role of the Food and Drug administration in approving new medical devices
(7) The student explains how medical technologies are managed. The student is expected to:	(C) analyze factors that affect the dissemination of new medical technologies	(i) analyze factors that affect the dissemination of new medical technologies
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(A) construct charts and graphs in facilitating data analysis and in communicating experimental results clearly and effectively using technology	(i) construct charts in facilitating data analysis using technology
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(A) construct charts and graphs in facilitating data analysis and in communicating experimental results clearly and effectively using technology	(ii) construct charts in communicating experimental results clearly using technology

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(A) construct charts and graphs in facilitating data analysis and in communicating experimental results clearly and effectively using technology	(iii) construct charts in communicating experimental results effectively using technology
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(A) construct charts and graphs in facilitating data analysis and in communicating experimental results clearly and effectively using technology	(iv) construct charts and graphs in facilitating data analysis using technology
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(A) construct charts and graphs in facilitating data analysis and in communicating experimental results clearly and effectively using technology	(v) construct charts and graphs in communicating experimental results clearly using technology
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(A) construct charts and graphs in facilitating data analysis and in communicating experimental results clearly and effectively using technology	(vi) construct charts and graphs in communicating experimental results effectively using technology
(8) The student applies research principles to create a project that addresses a major health problem. The student is expected to:	(B) present the project to classmates, health professionals, parents, or instructors	(i) present the project to classmates, health professionals, parents or instructors

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.227. Pathophysiology (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: Biology and Chemistry. Recommended prerequisite: a course from the Health Science Career Cluster. Students must meet the 40% laboratory and fieldwork. This course satisfies a high school science graduation requirement. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Pathophysiology course is designed for students to conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Pathophysiology will study disease processes and how humans are affected. Emphasis is placed on prevention and treatment of disease. Students will differentiate between normal and abnormal physiology.
(4) Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.
(5) Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation are experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.
(6) Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods (scientific methods) and ethical and social decisions that involve science (the application of scientific information).
(7) A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.
(8) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(9) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(i) demonstrate verbal communication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student for at least 40% of instructional time, conducts field laboratory investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations	(i) demonstrate safe practices during laboratory investigations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student for at least 40% of instructional time, conducts field laboratory investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations	(ii) demonstrate safe practices during field investigations
(2) The student for at least 40% of instructional time, conducts field laboratory investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(i) demonstrate an understanding of the use of resources
(2) The student for at least 40% of instructional time, conducts field laboratory investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(ii) demonstrate an understanding of the conservation of resources

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student for at least 40% of instructional time, conducts field laboratory investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:	(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(iii) demonstrate an understanding of the proper disposal or recycling of materials
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section	(i) know the definition of science, as specified in subsection (b)(4) [above]
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section	(ii) understand that [science] has limitations, as specified in subsection (b)(3) [above]
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(i) know that hypotheses are tentative statements that must be capable of being supported or not supported by observational evidence
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(ii) know that hypotheses are testable statements that must be capable of being supported or not supported by observational evidence

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	(iii) [know that] hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(i) know that scientific theories are based on natural and physical phenomena
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(ii) know that scientific theories are capable of being tested by multiple independent researchers
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(iii) [know that] unlike hypotheses, scientific theories are well-established explanations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(iv) [know that], unlike hypotheses, scientific theories are highly-reliable explanations
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(v) [know that] scientific theories may be subject to change as new areas of science are created
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science are created and new technologies emerge	(vi) [know that] scientific theories may be subject to change as new technologies emerge
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(D) distinguish between scientific hypotheses and scientific theories	(i) distinguish between scientific hypotheses and scientific theories
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(i) plan descriptive investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(ii) plan descriptive investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(iii) plan descriptive investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(iv) implement descriptive investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(v) implement descriptive investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(vi) implement descriptive investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(vii) plan comparative investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(viii) plan comparative investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(ix) plan comparative investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(x) plan comparative investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xi) implement comparative investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xii) implement comparative investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xiii) implement comparative investigations, including selecting equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xiv) implement comparative investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xv) plan experimental investigations, including asking questions
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xvi) plan experimental investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xvii) plan experimental investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xviii) plan experimental investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xix) implement experimental investigations, including asking questions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xx) implement experimental investigations, including formulating testable hypotheses
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xxi) implement experimental investigations, including selecting equipment
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(E) plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology	(xxii) implement experimental investigations, including selecting technology
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(i) collect qualitative data using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(ii) organize qualitative data using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(iii) collect quantitative data using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(iv) organize quantitative data using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(v) make measurements with accuracy using [various] tools

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures	(vi) make measurements with precision using [various] tools
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(i) analyze data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(ii) evaluate data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(iii) make inferences from data
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(G) analyze, evaluate, make inferences, and predict trends from data	(iv) predict trends from data

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:	(H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports	(i) communicate valid conclusions supported by the data through [various] methods
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(i) in all fields of science, analyze scientific explanations by using empirical evidence
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(ii) in all fields of science, analyze scientific explanations by using logical reasoning
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(iii) in all fields of science, analyze scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(iv) in all fields of science, analyze scientific explanations by using observational testing

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(v) in all fields of science, analyze scientific explanations including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(vi) in all fields of science, evaluate scientific explanations by using empirical evidence
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(vii) in all fields of science, evaluate scientific explanations by using logical reasoning
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(viii) in all fields of science, evaluate scientific explanations by using experimental testing

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(ix) in all fields of science, evaluate scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(x) in all fields of science, evaluate scientific explanations including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xi) in all fields of science, critique scientific explanations by using empirical evidence
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xii) in all fields of science, critique scientific explanations by using logical reasoning

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xiii) in all fields of science, critique scientific explanations by using experimental testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xiv) in all fields of science, critique scientific explanations by using observational testing
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking	(xv) in all fields of science, critique scientific explanations including examining all sides of scientific evidence of those scientific explanations
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials	(i) communicate scientific information extracted from various sources
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(B) communicate and apply scientific information extracted from various sources such as accredited scientific journals, institutions of higher learning, current events, news reports, published journal articles, and marketing materials	(ii) apply scientific information extracted from various sources

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(C) draw inferences based on data related to promotional materials for products and services	(i) draw inferences based on data related to promotional materials for products
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(C) draw inferences based on data related to promotional materials for products and services	(ii) draw inferences based on data related to promotional materials for services
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(D) evaluate the impact of scientific research on society and the environment	(i) evaluate the impact of scientific research on society
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(D) evaluate the impact of scientific research on society and the environment	(ii) evaluate the impact of scientific research on the environment
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(E) evaluate models according to their limitations in representing biological objects or events	(i) evaluate models according to their limitations in representing biological objects or events
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(i) research the history of science

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(ii) research contributions of scientists
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(iii) describe the history of science
(4) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:	(F) research and describe the history of science and contributions of scientists	(iv) describe the contributions of scientists
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(A) identify biological and chemical processes at the cellular level	(i) identify biological processes at the cellular level
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(A) identify biological and chemical processes at the cellular level	(ii) identify chemical processes at the cellular level
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(i) detect changes resulting from mutations by examining cells
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(ii) detect changes resulting from mutations by examining tissues

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(iii) detect changes resulting from mutations by examining organs
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(iv) detect changes resulting from mutations by examining systems
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(v) detect changes resulting from neoplasms by examining cells
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(vi) detect changes resulting from neoplasms by examining tissues
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(vii) detect changes resulting from neoplasms by examining organs
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(B) detect changes resulting from mutations and neoplasms by examining cells, tissues, organs, and systems	(viii) detect changes resulting from neoplasms by examining systems
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(C) identify factors that contribute to disease such as age, gender, environment, lifestyle, and heredity	(i) identify factors that contribute to disease
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(D) examine the body's compensating mechanisms occurring under various conditions	(i) examine the body's compensating mechanisms occurring under various conditions

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student analyzes the mechanisms of pathology. The student is expected to:	(E) analyze how the body attempts to maintain homeostasis when changes occur	(i) analyze how the body attempts to maintain homeostasis when changes occur
(6) The student examines the process of pathogenesis. The student is expected to:	(A) identify pathogenic organisms using microbiological techniques	(i) identify pathogenic organisms using microbiological techniques
(6) The student examines the process of pathogenesis. The student is expected to:	(B) differentiate the stages of pathogenesis, including incubation period, prodromal period, and exacerbation or remission	(i) differentiate the stages of pathogenesis, including incubation period, prodromal period, and exacerbation or remission
(6) The student examines the process of pathogenesis. The student is expected to:	(C) analyze the body's natural defense systems against infection such as barriers, the inflammatory response, and the immune response	(i) analyze the body's natural defense systems against infection
(6) The student examines the process of pathogenesis. The student is expected to:	(D) evaluate the effects of chemical agents, environmental pollution, and trauma on the disease process	(i) evaluate the effects of chemical agents on the disease process
(6) The student examines the process of pathogenesis. The student is expected to:	(D) evaluate the effects of chemical agents, environmental pollution, and trauma on the disease process	(ii) evaluate the effects of environmental pollution on the disease process
(6) The student examines the process of pathogenesis. The student is expected to:	(D) evaluate the effects of chemical agents, environmental pollution, and trauma on the disease process	(iii) evaluate the effects of trauma on the disease process
(6) The student examines the process of pathogenesis. The student is expected to:	(E) research stages in the progression of disease	(i) research stages in the progression of disease

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines a variety of human diseases. The student is expected to:	(A) describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases	(i) describe the nature of diseases including the etiology
(7) The student examines a variety of human diseases. The student is expected to:	(A) describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases	(ii) describe the nature of diseases including signs and symptoms
(7) The student examines a variety of human diseases. The student is expected to:	(A) describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases	(iii) describe the nature of diseases including the diagnosis
(7) The student examines a variety of human diseases. The student is expected to:	(A) describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases	(iv) describe the nature of diseases including the prognosis
(7) The student examines a variety of human diseases. The student is expected to:	(A) describe the nature of diseases, including the etiology, signs and symptoms, diagnosis, prognosis, and treatment options for diseases	(v) describe the nature of diseases including the treatment options
(7) The student examines a variety of human diseases. The student is expected to:	(B) explore advanced technologies for the diagnosis and treatment of disease	(i) explore advanced technologies for the diagnosis of disease
(7) The student examines a variety of human diseases. The student is expected to:	(B) explore advanced technologies for the diagnosis and treatment of disease	(ii) explore advanced technologies for the treatment of disease
(7) The student examines a variety of human diseases. The student is expected to:	(C) examine reemergence of diseases such as malaria, tuberculosis, and polio	(i) examine reemergence of diseases

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student examines a variety of human diseases. The student is expected to:	(D) differentiate between hospital-acquired infections and community-acquired infections	(i) differentiate between hospital-acquired infections and community-acquired infections
(7) The student examines a variety of human diseases. The student is expected to:	(E) examine antibiotic-resistant diseases such as methicillin resistant Staphylococcus aureus	(i) examine antibiotic-resistant diseases
(7) The student examines a variety of human diseases. The student is expected to:	(F) differentiate between congenital disorders and childhood diseases	(i) differentiate between congenital disorders and childhood diseases
(7) The student examines a variety of human diseases. The student is expected to:	(G) investigate ways diseases affect multiple body systems	(i) investigate ways diseases affect multiple body systems
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(A) evaluate public health issues related to asepsis, isolation, immunization, and quarantine	(i) evaluate public health issues related to asepsis
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(A) evaluate public health issues related to asepsis, isolation, immunization, and quarantine	(ii) evaluate public health issues related to isolation
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(A) evaluate public health issues related to asepsis, isolation, immunization, and quarantine	(iii) evaluate public health issues related to immunization
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(A) evaluate public health issues related to asepsis, isolation, immunization, and quarantine	(iv) evaluate public health issues related to quarantine
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(B) analyze the effects of stress and aging on the body	(i) analyze the effects of stress on the body

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(B) analyze the effects of stress and aging on the body	(ii) analyze the effects of aging on the body
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(C) evaluate treatment options for diseases	(i) evaluate treatment options for diseases
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(D) investigate diseases that threaten world health and propose intervention strategies	(i) investigate diseases that threaten world health
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(D) investigate diseases that threaten world health and propose intervention strategies	(ii) propose intervention strategies
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(E) develop a plan for personal health and wellness	(i) develop a plan for personal health
(8) The student integrates the effects of disease prevention and control. The student is expected to:	(E) develop a plan for personal health and wellness	(ii) develop a plan for personal wellness

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.228. Health Informatics (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: Business Management I and Medical Terminology. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Health Informatics course is designed to provide knowledge of one of the fastest growing areas in both academic and professional fields. The large gap between state of the art computer technologies and the state of affairs in health care information technology has generated demand for information and health professionals who can effectively design, develop, and use technologies such as electronic medical records, patient monitoring systems, and digital libraries, while managing the vast amount of data generated by these systems.
(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples..

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(i) demonstrate verbal commumnication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(ii) demonstrate non-verbal commumnication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate adaptability skills such as problem solving and creative thinking	(i) demonstrate adaptability skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) develop a career plan	(i) develop a career plan
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork	(i) employ teamwork
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) create a job-specific resume	(i) create a job-specific resume
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) appraise the characteristics desired by employers such as work ethics and professionalism	(i) appraise the characteristics desired by employers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(A) discuss and define the common information systems	(i) discuss the common information systems
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(A) discuss and define the common information systems	(ii) define the common information systems
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(B) differentiate between the six types of information systems	(i) differentiate between the six types of information systems
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(C) explain how each of the six information systems support the administrative, financial, clinical, and research needs of a health care enterprise	(i) explain how each of the six information systems support the administrative needs of a health care enterprise
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(C) explain how each of the six information systems support the administrative, financial, clinical, and research needs of a health care enterprise	(ii) explain how each of the six information systems support the financial needs of a health care enterprise
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(C) explain how each of the six information systems support the administrative, financial, clinical, and research needs of a health care enterprise	(iii) explain how each of the six information systems support the clinical needs of a health care enterprise

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(C) explain how each of the six information systems support the administrative, financial, clinical, and research needs of a health care enterprise	(iv) explain how each of the six information systems support the research needs of a health care enterprise
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(D) describe the components of an information system	(i) describe the components of an information system
(2) The student interprets fundamental knowledge of concepts of health information systems technology and the tools for collecting, storing, and retrieving health care data. The student is expected to:	(E) implement the concepts of health informatics by creating a culminating project	(i) implement the concepts of health informatics by creating a culminating project
(3) The student employs the various types of databases in relation to health informatics. The student is expected to:	(A) define the function of a database management system	(i) define the function of a database management system
(3) The student employs the various types of databases in relation to health informatics. The student is expected to:	(B) identify the purpose of data modeling	(i) identify the purpose of data modeling
(3) The student employs the various types of databases in relation to health informatics. The student is expected to:	(C) define the customary steps in the data modeling process	(i) define the customary steps in the data modeling process
(3) The student employs the various types of databases in relation to health informatics. The student is expected to:	(D) differentiate between entities, attributes, and relationships in a data model	(i) differentiate between entities, attributes, and relationships in a data model

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student employs the various types of databases in relation to health informatics. The student is expected to:	(E) explain various types of organizational databases	(i) explain various types of organizational databases
(4) The student distinguishes between data and information. The student is expected to:	(A) discuss the importance of data security, accuracy, integrity, and validity	(i) discuss the importance of data security
(4) The student distinguishes between data and information. The student is expected to:	(A) discuss the importance of data security, accuracy, integrity, and validity	(ii) discuss the importance of data accuracy
(4) The student distinguishes between data and information. The student is expected to:	(A) discuss the importance of data security, accuracy, integrity, and validity	(iii) discuss the importance of data integrity
(4) The student distinguishes between data and information. The student is expected to:	(A) discuss the importance of data security, accuracy, integrity, and validity	(iv) discuss the importance of data validity
(4) The student distinguishes between data and information. The student is expected to:	(B) demonstrate an understanding of data information concepts for health information systems and electronic health records	(i) demonstrate an understanding of data information concepts for health information systems
(4) The student distinguishes between data and information. The student is expected to:	(B) demonstrate an understanding of data information concepts for health information systems and electronic health records	(ii) demonstrate an understanding of data information concepts for electronic health records
(5) The student examines the evolution of the health information system. The student is expected to:	(A) evaluate the growing role of the electronic health record	(i) evaluate the growing role of the electronic health record

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student examines the evolution of the health information system. The student is expected to:	(B) review the progress of the development of the electronic health record	(i) review the progress of the development of the electronic health record
(5) The student examines the evolution of the health information system. The student is expected to:	(C) explain functional requirements for electronic health records	(i) explain functional requirements for electronic health records
(6) The student examines the process of medical diagnostic and coding concepts as well as current procedural practices. The student is expected to:	(A) examine Health Insurance Portability and Accountability Act (HIPAA) guidelines for confidentiality, privacy, and security of a patient's information within the medical record	(i) examine Health Insurance Portability and Accountability Act (HIPAA) guidelines for confidentiality, privacy, and security of a patient's information within the medical record
(6) The student examines the process of medical diagnostic and coding concepts as well as current procedural practices. The student is expected to:	(B) differentiate between insurance fraud and insurance abuse	(i) differentiate between insurance fraud and insurance abuse
(6) The student examines the process of medical diagnostic and coding concepts as well as current procedural practices. The student is expected to:	(C) discuss the linkage between current procedural technology (CPT) codes, International Classification of Diseases, 10th revision, clinical modification (ICD-10-CM) codes, and medical necessity for reimbursement for charges billed	(i) discuss the linkage between current procedural technology (CPT) codes, International Classification of Diseases, 10th revision, clinical modification (ICD-10-CM) codes, and medical necessity for reimbursement for charges billed
(6) The student examines the process of medical diagnostic and coding concepts as well as current procedural practices. The student is expected to:	(D) search ICD-10-CM code system for correct diagnosis code using patient information	(i) search ICD-10-CM code system for correct diagnosis code using patient information
(6) The student examines the process of medical diagnostic and coding concepts as well as current procedural practices. The student is expected to:	(E) identify the two types of codes in the health care common procedure coding system (HCPCS)	(i) identify the two types of codes in the health care common procedure coding system (HCPCS)

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student examines the process of medical diagnostic and coding concepts as well as current procedural practices. The student is expected to:	(F) explain how medical coding affects the payment process	(i) explain how medical coding affects the payment process
(7) The student identifies agencies involved in the health insurance claims process. The student is expected to:	(A) define Medicaid and Medicare	(i) define Medicaid
(7) The student identifies agencies involved in the health insurance claims process. The student is expected to:	(A) define Medicaid and Medicare	(ii) define Medicare
(7) The student identifies agencies involved in the health insurance claims process. The student is expected to:	(B) discuss health care benefit programs such as TRICARE and CHAMPVA	(i) discuss health care benefit programs
(7) The student identifies agencies involved in the health insurance claims process. The student is expected to:	(C) explain how to manage a worker's compensation case	(i) explain how to manage a worker's compensation case
(7) The student identifies agencies involved in the health insurance claims process. The student is expected to:	(D) complete a current health insurance claim form such as the Centers for Medicare and Medicaid Service (CMS-1500) form	(i) complete a current health insurance claim form
(7) The student identifies agencies involved in the health insurance claims process. The student is expected to:	(E) identify three ways to transmit electronic claims	(i) identify three ways to transmit electronic claims

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.229. Mathematics for Medical Professionals (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for student in Grades 11 and 12. Prerequisites: Geometry and Algebra II. This course satisfies a high school mathematics graduation requirement. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Mathematics for Medical Professionals course is designed to serve as the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on fluency and solid understanding in medical mathematics, students will extend and apply mathematical skills necessary for health science professions. Course content consists primarily of high school level mathematics concepts and their applications to health science professions.
(4) The mathematical process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, and number sense to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.
(5) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(6) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.		
Knowledge and Skill Statement	**Student Expectation**	**Breakout**
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas in a clear, concise, and effective manner	(i) express ideas in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate adaptability skills such as problem solving and creative thinking	(i) demonstrate adaptability skills
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(A) apply mathematics to problems arising in health science professions	(i) apply mathematics to problems arising in health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	(i) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	(ii) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the reasonableness of the solution
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(i) select tools, including real objects as appropriate, to solve problems
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(ii) select tools, including manipulatives as appropriate, to solve problems
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(iii) select tools, including paper and pencil as appropriate, to solve problems

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(iv) select tools, including technology as appropriate, to solve problems
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(v) select techniques, including mental math as appropriate, to solve problems
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(vi) select techniques, including estimation as appropriate, to solve problems
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems in health science professions	(vii) select techniques, including number sense as appropriate, to solve problems
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(i) communicate mathematical ideas using multiple representations, including symbols as appropriate

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(ii) communicate mathematical ideas using multiple representations, including diagrams as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(iii) communicate mathematical ideas using multiple representations, including graphs as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(iv) communicate mathematical ideas using multiple representations, including language as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(v) communicate mathematical reasoning using multiple representations, including symbols as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(vi) communicate mathematical reasoning using multiple representations, including diagrams as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(vii) communicate mathematical reasoning using multiple representations, including graphs as appropriate

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(viii) communicate mathematical reasoning using multiple representations, including language as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(ix) communicate [mathematical ideas'] implications using multiple representations, including symbols as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(x) communicate [mathematical ideas'] implications using multiple representations, including diagrams as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(xi) communicate [mathematical ideas'] implications using multiple representations, including graphs as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(xii) communicate [mathematical ideas'] implications using multiple representations, including language as appropriate

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(xiii) communicate [mathematical reasoning's] implications using multiple representations, including symbols as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(xiv) communicate [mathematical reasoning's] implications using multiple representations, including diagrams as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(xv) communicate [mathematical reasoning's] implications using multiple representations, including graphs as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(D) communicate mathematical ideas, reasoning, and their implications to the health science field using multiple representations, including symbols, diagrams, graphs, and language as appropriate	(xvi) communicate [mathematical reasoning's] implications using multiple representations, including language as appropriate
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(E) create and use representations to organize, record, and communicate mathematical ideas in health science professions	(i) create representations to organize mathematical ideas in health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(E) create and use representations to organize, record, and communicate mathematical ideas in health science professions	(ii) create representations to record mathematical ideas in health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(E) create and use representations to organize, record, and communicate mathematical ideas in health science professions	(iii) create representations to communicate mathematical ideas in health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(E) create and use representations to organize, record, and communicate mathematical ideas in health science professions	(iv) use representations to organize mathematical ideas in health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(E) create and use representations to organize, record, and communicate mathematical ideas in health science professions	(v) use representations to record mathematical ideas in health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(E) create and use representations to organize, record, and communicate mathematical ideas in health science professions	(vi) use representations to communicate mathematical ideas in health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(F) analyze mathematical relationships to connect and communicate mathematical ideas in health science professions	(i) analyze mathematical relationships to connect mathematical ideas in health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(F) analyze mathematical relationships to connect and communicate mathematical ideas in health science professions	(ii) analyze mathematical relationships to communicate mathematical ideas in health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication as it applies to health science professions	(i) display mathematical ideas using precise mathematical language in written or oral communication as it applies to health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication as it applies to health science professions	(ii) display mathematical arguments using precise mathematical language in written or oral communication as it applies to health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication as it applies to health science professions	(iii) explain mathematical ideas using precise mathematical language in written or oral communication as it applies to health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication as it applies to health science professions	(iv) explain mathematical arguments using precise mathematical language in written or oral communication as it applies to health science professions
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication as it applies to health science professions	(v) justify mathematical ideas using precise mathematical language in written or oral communication as it applies to health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication as it applies to health science professions	(vi) justify mathematical arguments using precise mathematical language in written or oral communication as it applies to health science professions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(A) add, subtract, multiply, and divide rational numbers fluently in problem-solving situations related to health science professions	(i) add rational numbers fluently in problem-solving situations related to health science professions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(A) add, subtract, multiply, and divide rational numbers fluently in problem-solving situations related to health science professions	(ii) subtract rational numbers fluently in problem-solving situations related to health science professions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(A) add, subtract, multiply, and divide rational numbers fluently in problem-solving situations related to health science professions	(iii) multiply rational numbers fluently in problem-solving situations related to health science professions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(A) add, subtract, multiply, and divide rational numbers fluently in problem-solving situations related to health science professions	(iv) divide rational numbers fluently in problem-solving situations related to health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(B) keep track of and manage inventory using the First In, Last Out (FILO) concept	(i) keep track of inventory using the First In, Last Out (FILO) concept
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(B) keep track of and manage inventory using the First In, Last Out (FILO) concept	(ii) manage inventory using the First In, Last Out (FILO) concept
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(i) solve health science related problems involving ratios accurately, including lab analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(ii) solve health science related problems involving ratios accurately, including body fluid analysis

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(iii) solve health science related problems involving ratios accurately, including vital signs
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(iv) solve health science related problems involving ratios accurately, including medication dosages
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(v) solve health science related problems involving ratios accurately, including medication administration
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(vi) solve health science related problems involving ratios accurately, including growth charts

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(vii) solve health science related problems involving ratios accurately, including body surface area
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(viii) solve health science related problems involving ratios accurately, including parenteral solutions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(ix) solve health science related problems involving ratios accurately, including data collection related to homeostasis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(x) solve health science related problems involving ratios precisely, including lab analysis

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xi) solve health science related problems involving ratios precisely, including body fluid analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xii) solve health science related problems involving ratios precisely, including vital signs
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xiii) solve health science related problems involving ratios precisely, including medication dosages
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xiv) solve health science related problems involving ratios precisely, including medication administration

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xv) solve health science related problems involving ratios precisely, including growth charts
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xvi) solve health science related problems involving ratios precisely, including body surface area
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xvii) solve health science related problems involving ratios precisely, including parenteral solutions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xviii) solve health science related problems involving ratios precisely, including data collection related to homeostasis

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xix) solve health science related problems involving rates accurately, including lab analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xx) solve health science related problems involving rates accurately, including body fluid analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxi) solve health science related problems involving rates accurately, including vital signs
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxii) solve health science related problems involving rates accurately, including medication dosages

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxiii) solve health science related problems involving rates accurately, including medication administration
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxiv) solve health science related problems involving rates accurately, including growth charts
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxv) solve health science related problems involving rates accurately, including body surface area
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxvi) solve health science related problems involving rates accurately, including parenteral solutions

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(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxvii) solve health science related problems involving rates accurately, including data collection related to homeostasis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxviii) solve health science related problems involving rates precisely, including lab analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxix) solve health science related problems involving rates precisely, including body fluid analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxx) solve health science related problems involving rates precisely, including vital signs

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(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxi) solve health science related problems involving rates precisely, including medication dosages
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxii) solve health science related problems involving rates precisely, including medication administration
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxiii) solve health science related problems involving rates precisely, including growth charts
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxiv) solve health science related problems involving rates precisely, including body surface area

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxv) solve health science related problems involving rates precisely, including parenteral solutions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxvi) solve health science related problems involving rates precisely, including data collection related to homeostasis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxvii) solve health science related problems involving percents accurately, including lab analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxviii) solve health science related problems involving percentages accurately, including body fluid analysis

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xxxix) solve health science related problems involving percentages accurately, including vital signs
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xl) solve health science related problems involving percents accurately, including medication dosages
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xli) solve health science related problems involving percentages accurately, including medication administration
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xlii) solve health science related problems involving percentages accurately, including growth charts

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xliii) solve health science related problems involving percentages accurately, including body surface area
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xliv) solve health science related problems involving percentages accurately, including parenteral solutions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xlv) solve health science related problems involving percentages accurately, including data collection related to homeostasis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xlvi) solve health science related problems involving percents precisely, including lab analysis

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xlvii) solve health science related problems involving percentages precisely, including body fluid analysis
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xlviii) solve health science related problems involving percentages precisely, including vital signs
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(xlix) solve health science related problems involving percents precisely, including medication dosages
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(l) solve health science related problems involving percentages precisely, including medication administration

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(Ii) solve health science related problems involving percentages precisely, including growth charts
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(Iii) solve health science related problems involving percentages precisely, including body surface area
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(Iiii) solve health science related problems involving percentages precisely, including parenteral solutions
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(C) solve health science related problems involving ratios, rates, and percentages accurately and precisely, including lab analysis, body fluid analysis, vital signs, medication dosages and administration, growth charts, body surface area, parenteral solutions and data collection related to homeostasis	(Iiv) solve health science related problems involving percentages precisely, including data collection related to homeostasis

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(D) learn to read and use military time fluently for health science situations, including medication administration, scheduling, and documentation	(i) learn to read military time fluently for health science situations, including medication administration
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(D) learn to read and use military time fluently for health science situations, including medication administration, scheduling, and documentation	(ii) learn to read military time fluently for health science situations, including scheduling
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(D) learn to read and use military time fluently for health science situations, including medication administration, scheduling, and documentation	(iii) learn to read military time fluently for health science situations, including documentation
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(D) learn to read and use military time fluently for health science situations, including medication administration, scheduling, and documentation	(iv) learn to use military time fluently for health science situations, including medication administration

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(D) learn to read and use military time fluently for health science situations, including medication administration, scheduling, and documentation	(v) learn to use military time fluently for health science situations, including scheduling
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(D) learn to read and use military time fluently for health science situations, including medication administration, scheduling, and documentation	(vi) learn to use military time fluently for health science situations, including documentation
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(E) apply appropriate estimation techniques used in health science professions to estimate percent and then confirm those estimates with calculations;	(i) apply appropriate estimation techniques used in health science professions to estimate percent
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(E) apply appropriate estimation techniques used in health science professions to estimate percent and then confirm those estimates with calculations;	(ii) confirm [percent] estimates with calculations;

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(F) read and determine accurate numerical value of Roman numerals as used in the health science professions, including cranial nerves	(i) read Roman numerals as used in the health science professions, including cranial nerves
(3) The student generates deeper mathematical understandings through problems involving numerical data that arise in health science professions. The student extends existing knowledge and skills to analyze real-world clinical situations. The student is expected to:	(F) read and determine accurate numerical value of Roman numerals as used in the health science professions, including cranial nerves	(ii) determine accurate numerical value of Roman numerals as used in the health science professions, including cranial nerves
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(A) collect data to create a scatterplot and apply various functions to model the data in an effort to interpret results and make predictions in health science situations such as interpreting growth charts, interpreting disease and mortality rates, and diagnosing and determining treatment modalities	(i) collect data to create a scatterplot

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(A) collect data to create a scatterplot and apply various functions to model the data in an effort to interpret results and make predictions in health science situations such as interpreting growth charts, interpreting disease and mortality rates, and diagnosing and determining treatment modalities	(ii) apply various functions to model the data in an effort to interpret results in health science situations
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(A) collect data to create a scatterplot and apply various functions to model the data in an effort to interpret results and make predictions in health science situations such as interpreting growth charts, interpreting disease and mortality rates, and diagnosing and determining treatment modalities	(iii) apply various functions to model the data in an effort to make predictions in health science situations
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(i) create appropriate mathematical functions used to model situations that occur in health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(ii) create appropriate mathematical functions used to interpret situations that occur in health science professions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(iii) create appropriate mathematical functions used to predict situations that occur in health science professions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(iv) represent appropriate mathematical functions used to model situations that occur in health science professions

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(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(v) represent appropriate mathematical functions used to interpret situations that occur in health science professions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(vi) represent appropriate mathematical functions used to predict situations that occur in health science professions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(vii) analyze appropriate mathematical functions used to model situations that occur in health science professions

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(viii) analyze appropriate mathematical functions used to interpret situations that occur in health science professions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(B) create, represent, and analyze appropriate mathematical functions such as linear, quadratic, exponential, logarithmic, and sinusoidal functions used to model, interpret and predict situations that occur in health science professions such as supply and demand, inventory control, and cost analysis within clinical situations	(ix) analyze appropriate mathematical functions used to predict situations that occur in health science professions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(C) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to electrocardiograms (EKG), repolarization of the heart, and medication dosage and administration	(i) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to electrocardiograms (EKG)

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(C) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to electrocardiograms (EKG), repolarization of the heart, and medication dosage and administration	(ii) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to repolarization of the heart
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(C) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to electrocardiograms (EKG), repolarization of the heart, and medication dosage and administration	(iii) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to medication dosage
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(C) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to electrocardiograms (EKG), repolarization of the heart, and medication dosage and administration	(iv) determine or analyze an appropriate sinusoidal model for health science situations that can be modeled with periodic functions, including those related to medication administration

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(D) write and solve systems of equations, especially those representing mixtures, which apply to health science situations, including intravenous (IV) solutions and medication dosages	(i) write systems of equations, especially those representing mixtures, which apply to health science situations, including intravenous (IV) solutions
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(D) write and solve systems of equations, especially those representing mixtures, which apply to health science situations, including intravenous (IV) solutions and medication dosages	(ii) write systems of equations, especially those representing mixtures, which apply to health science situations, including medication dosages
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(D) write and solve systems of equations, especially those representing mixtures, which apply to health science situations, including intravenous (IV) solutions and medication dosages	(iii) solve systems of equations, especially those representing mixtures, which apply to health science situations, including intravenous (IV) solutions

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(D) write and solve systems of equations, especially those representing mixtures, which apply to health science situations, including intravenous (IV) solutions and medication dosages	(iv) solve systems of equations, especially those representing mixtures, which apply to health science situations, including medication dosages
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(E) use properties of logarithmic and exponential functions to solve equations related to health science situations such as determining the pH of a solution, the concentration of hydrogen ions (H+) given the pH, calculating the absorbance and transmittance, and determining exponential growth and decay	(i) use properties of logarithmic functions to solve equations related to health science situations
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(E) use properties of logarithmic and exponential functions to solve equations related to health science situations such as determining the pH of a solution, the concentration of hydrogen ions (H+) given the pH, calculating the absorbance and transmittance, and determining exponential growth and decay	(ii) use properties of exponential functions to solve equations related to health science situations

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(F) calculate accurate and precise unit rates used in health science situations	(i) calculate accurate unit rates used in health science situations
(4) The student applies the process standards in mathematics to create and analyze mathematical models of health science situations to make informed decisions related to improved health care outcomes by appropriate, proficient, and efficient use of tools, including technology. The student judges the validity of a prediction and uses mathematical models to represent, analyze, and solve dynamic health care problems. The student is expected to:	(F) calculate accurate and precise unit rates used in health science situations	(ii) calculate precise unit rates used in health science situations
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(A) define each of the health science professions that require a unique set of measurement or calculation standards and explain or identify the importance of each measurement system (apothecary, metric, household systems)	(i) define each of the health science professions that require a unique set of measurement or calculation standards

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(A) define each of the health science professions that require a unique set of measurement or calculation standards and explain or identify the importance of each measurement system (apothecary, metric, household systems)	(ii) explain or identify the importance of each measurement system (apothecary, metric, household systems)
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(B) explain the necessity of obtaining accurate measurements in the health science professions	(i) explain the necessity of obtaining accurate measurements in the health science professions
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(C) use dimensional analysis with precision and accuracy in performing unit conversions from one measurement system to another, including the use of proportions and unit rates in pharmacology	(i) use dimensional analysis with precision in performing unit conversions from one measurement system to another, including the use of proportions in pharmacology
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(C) use dimensional analysis with precision and accuracy in performing unit conversions from one measurement system to another, including the use of proportions and unit rates in pharmacology	(ii) use dimensional analysis with precision in performing unit conversions from one measurement system to another, including the use of unit rates in pharmacology
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(C) use dimensional analysis with precision and accuracy in performing unit conversions from one measurement system to another, including the use of proportions and unit rates in pharmacology	(iii) use dimensional analysis with accuracy in performing unit conversions from one measurement system to another, including the use of proportions in pharmacology

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(C) use dimensional analysis with precision and accuracy in performing unit conversions from one measurement system to another, including the use of proportions and unit rates in pharmacology	(iv) use dimensional analysis with accuracy in performing unit conversions from one measurement system to another, including the use of unit rates in pharmacology
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(D) classify the specific system to which a given unit belongs and explain its similarity or differences to units in other measurement systems	(i) classify the specific system to which a given unit belongs
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(D) classify the specific system to which a given unit belongs and explain its similarity or differences to units in other measurement systems	(ii) explain [unit's] similarity or differences to units in other measurement systems
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(E) select and use appropriate measurement tools used in health science professions such as rulers, tape measures, thermometers, syringes, scales, and sphygmomanometer gauges to obtain accurate and precise measurements	(i) select appropriate measurement tools used in health science professions to obtain accurate measurements
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(E) select and use appropriate measurement tools used in health science professions such as rulers, tape measures, thermometers, syringes, scales, and sphygmomanometer gauges to obtain accurate and precise measurements	(ii) select appropriate measurement tools used in health science professions to obtain precise measurements

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(E) select and use appropriate measurement tools used in health science professions such as rulers, tape measures, thermometers, syringes, scales, and sphygmomanometer gauges to obtain accurate and precise measurements	(iii) use appropriate measurement tools used in health science professions to obtain accurate measurements
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(E) select and use appropriate measurement tools used in health science professions such as rulers, tape measures, thermometers, syringes, scales, and sphygmomanometer gauges to obtain accurate and precise measurements	(iv) use appropriate measurement tools used in health science professions to obtain precise measurements
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(i) select appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for medication
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(ii) select appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for nutrition
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(iii) select appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for fluids

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(iv) select appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for homeostasis
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(v) select appropriate measurement techniques used in health science professions to obtain precise measurements, including determining measures for medication
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(vi) use appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for nutrition
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(vii) use appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for fluids
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(viii) use appropriate measurement techniques used in health science professions to obtain accurate measurements, including determining measures for homeostasis
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(ix) use appropriate measurement techniques used in health science professions to obtain precise measurements, including determining measures for medication

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(x) use appropriate measurement techniques used in health science professions to obtain precise measurements, including determining measures for nutrition
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(xi) use appropriate measurement techniques used in health science professions to obtain precise measurements, including determining measures for fluids
(5) The student applies mathematical process standards to obtain accurate and precise measurements. The student is expected to:	(F) select and use appropriate measurement techniques used in health science professions to obtain accurate and precise measurements, including determining measures for medication, nutrition, fluids, and homeostasis	(xii) use appropriate measurement techniques used in health science professions to obtain precise measurements, including determining measures for homeostasis
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(A) obtain and analyze lab reports to evaluate if values lie outside normal parameters	(i) obtain lab reports
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(A) obtain and analyze lab reports to evaluate if values lie outside normal parameters	(ii) analyze lab reports to evaluate if values lie outside normal parameters
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(B) obtain and analyze vital signs by comparing to normal parameters	(i) obtain vital signs

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(B) obtain and analyze vital signs by comparing to normal parameters	(ii) analyze vital signs by comparing to normal parameters
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(C) calculate and apply measures of central tendency in application problems in the health science field	(i) calculate measures of central tendency in application problems in the health science field
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(C) calculate and apply measures of central tendency in application problems in the health science field	(ii) apply measures of central tendency in application problems in the health science field
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(D) demonstrate an understanding of the significance of the normal distribution	(i) demonstrate an understanding of the significance of the normal distribution
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(E) demonstrate an understanding of and apply the Empirical Rule to find probabilities from normal distributions	(i) demonstrate an understanding of the Empirical Rule
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(E) demonstrate an understanding of and apply the Empirical Rule to find probabilities from normal distributions	(ii) apply the Empirical Rule to find probabilities from normal distributions
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(F) calculate and use the z-score to calculate standard deviation of a normal distribution using a formula	(i) calculate the z-score

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(F) calculate and use the z-score to calculate standard deviation of a normal distribution using a formula	(ii) use the z-score to calculate standard deviation of a normal distribution using a formula
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(G) calculate the percentile rank for a given score using a formula	(i) calculate the percentile rank for a given score using a formula
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(H) describe characteristics of well-designed and well-conducted experiments, observational studies, and surveys in the health science field, including the ethical issues associated with each	(i) describe characteristics of well-designed experiments in the health science field, including the ethical issues associated with each
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(H) describe characteristics of well-designed and well-conducted experiments, observational studies, and surveys in the health science field, including the ethical issues associated with each	(ii) describe characteristics of well-designed observational studies in the health science field, including the ethical issues associated with each
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(H) describe characteristics of well-designed and well-conducted experiments, observational studies, and surveys in the health science field, including the ethical issues associated with each	(iii) describe characteristics of well-designed surveys in the health science field, including the ethical issues associated with each
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(H) describe characteristics of well-designed and well-conducted experiments, observational studies, and surveys in the health science field, including the ethical issues associated with each	(iv) describe characteristics of well-conducted experiments in the health science field, including the ethical issues associated with each

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(H) describe characteristics of well-designed and well-conducted experiments, observational studies, and surveys in the health science field, including the ethical issues associated with each	(v) describe characteristics of well-conducted observational studies in the health science field, including the ethical issues associated with each
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(H) describe characteristics of well-designed and well-conducted experiments, observational studies, and surveys in the health science field, including the ethical issues associated with each	(vi) describe characteristics of well-conducted surveys in the health science field, including the ethical issues associated with each
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(I) distinguish between populations and samples	(i) distinguish between populations and samples
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(J) explain placebo and placebo effect	(i) explain placebo
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(J) explain placebo and placebo effect	(ii) explain placebo effect
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(K) define epidemiology and its extension of statistical procedures to public health issues	(i) define epidemiology
(6) The student applies mathematical process standards to analyze statistical information used in health science professions. The student is expected to:	(K) define epidemiology and its extension of statistical procedures to public health issues	(ii) define [epidemiology's] extension of statistical procedures to public health issues

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(A) calculate volumes of various liquids and solids encountered in health science professions, including irregularly shaped solids, using formulas and geometric reasoning	(i) calculate volumes of various liquids encountered in health science professions using formulas
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(A) calculate volumes of various liquids and solids encountered in health science professions, including irregularly shaped solids, using formulas and geometric reasoning	(ii) calculate volumes of various liquids encountered in health science professions using geometric reasoning
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(A) calculate volumes of various liquids and solids encountered in health science professions, including irregularly shaped solids, using formulas and geometric reasoning	(iii) calculate volumes of various solids encountered in health science professions, including irregularly shaped solids, using formulas
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(A) calculate volumes of various liquids and solids encountered in health science professions, including irregularly shaped solids, using formulas and geometric reasoning	(iv) calculate volumes of various solids encountered in health science professions, including irregularly shaped solids, using geometric reasoning
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(B) calculate surface area of various surfaces encountered in health science professions, including body surface area, using formulas and geometric reasoning	(i) calculate surface area of various surfaces encountered in health science professions, including body surface area, using formulas
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(B) calculate surface area of various surfaces encountered in health science professions, including body surface area, using formulas and geometric reasoning	(ii) calculate surface area of various surfaces encountered in health science professions, including using geometric reasoning

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(C) calculate appropriate angles encountered in health science professions such as medication administration, body positioning, and physical therapy using geometric reasoning	(i) calculate appropriate angles encountered in health science professions using geometric reasoning
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(D) calculate and analyze range of motion using a goniometer	(i) calculate range of motion using a goniometer
(7) The student applies mathematical process standards to solve geometric problems arising in health science professions. The student is expected to:	(D) calculate and analyze range of motion using a goniometer	(ii) analyze range of motion using a goniometer

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.230. Pharmacology (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: Biology and Chemistry. Recommended prerequisite: a course from the Health Science Career Cluster. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Pharmacology course is designed to study how natural and synthetic chemical agents such as drugs affect biological systems. Knowledge of the properties of therapeutic agents is vital in providing quality health care. It is an ever-changing, growing body of information that continually demands greater amounts of time and education from health care workers.
(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(i) demonstrate verbal commumnication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(ii) demonstrate non-verbal commumnication in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate adaptability skills such as problem solving and creative thinking	(i) demonstrate adaptability skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) develop a career plan	(i) develop a career plan
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork	(i) employ teamwork
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) create a job-specific resume	(i) create a job-specific resume
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) appraise the characteristics desired by employers	(i) appraise the characteristics desired by employers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(A) define pharmacology and its major subdivisions, including pharmacodynamics, pharmacokinetics, and pharmacotherapeutics	(i) define pharmacology
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(A) define pharmacology and its major subdivisions, including pharmacodynamics, pharmacokinetics, and pharmacotherapeutics	(ii) define [pharmacology's] major subdivisions, including pharmacodynamics
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(A) define pharmacology and its major subdivisions, including pharmacodynamics, pharmacokinetics, and pharmacotherapeutics	(iii) define [pharmacology's] major subdivisions, including pharmacokinetics
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(A) define pharmacology and its major subdivisions, including pharmacodynamics, pharmacokinetics, and pharmacotherapeutics	(iv) define [pharmacology's] major subdivisions, including pharmacotherapeutics
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(B) explain the difference between therapeutic effects, side effects, and toxic effects	(i) explain the difference between therapeutic effects, side effects, and toxic effects
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(C) identify a drug receptor in the human body	(i) identify a drug receptor in the human body

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(D) trace the interaction and antagonist receptor	(i) trace the interaction receptor
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(D) trace the interaction and antagonist receptor	(ii) trace the antagonist receptor
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(E) explain the relationship between drug dosage, drug response, and time	(i) explain the relationship between drug dosage, drug response, and time
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(F) explain drug safety and therapeutic index	(i) explain drug safety
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(F) explain drug safety and therapeutic index	(ii) explain therapeutic index
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(G) describe three names by which drugs are known	(i) describe three names by which drugs are known

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(H) list two common drug reference books	(i) list two common drug reference books
(3) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(A) identify career pathways related to pharmacology	(i) identify career pathways related to pharmacology
(3) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(B) define the role of the pharmacy team	(i) define the role of the pharmacy team
(3) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(C) research and describe emerging pharmacy career opportunities	(i) research emerging pharmacy career opportunities
(3) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(C) research and describe emerging pharmacy career opportunities	(ii) describe emerging pharmacy career opportunities
(3) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(D) analyze the impact of pharmaceuticals on the costs of health care	(i) analyze the impact of pharmaceuticals on the costs of health care

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student identifies individuals associated with manufacturing, dispensing, and administrating pharmaceuticals as a valued member of a health care team. The student is expected to:	(E) evaluate the impact of pharmaceuticals on the costs of society	(i) evaluate the impact of pharmaceuticals on the costs of society
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(A) describe the legal terms and consequences associated with prescription errors	(i) describe the legal terms associated with prescription errors
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(A) describe the legal terms and consequences associated with prescription errors	(ii) describe the legal consequences associated with prescription errors
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(B) analyze the six routes of medication administration	(i) analyze the six routes of medication administration
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(C) differentiate between negligence, product liability, contributory negligence, and regulatory law	(i) differentiate between negligence, product liability, contributory negligence, and regulatory law
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(D) evaluate the effect of medication errors related to the pharmacy and the industry	(i) evaluate the effect of medication errors related to the pharmacy
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(D) evaluate the effect of medication errors related to the pharmacy and the industry	(ii) evaluate the effect of medication errors related to the industry

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(E) discuss the elements of a lawsuit	(i) discuss the elements of a lawsuit
(4) The student explains the ethical and legal responsibilities of pharmacists and pharmacy technicians. The student is expected to:	(F) define professional liability	(i) define professional liability
(5) The student uses a comprehensive medical vocabulary in order to communicate effectively with other health care professionals. The student is expected to:	(A) identify the various routes of drug medication	(i) identify the various routes of drug medication
(5) The student uses a comprehensive medical vocabulary in order to communicate effectively with other health care professionals. The student is expected to:	(B) differentiate among the various classes of drugs	(i) differentiate among the various classes of drugs
(5) The student uses a comprehensive medical vocabulary in order to communicate effectively with other health care professionals. The student is expected to:	(C) properly use common terms associated with pharmacology	(i) properly use common terms associated with pharmacology
(5) The student uses a comprehensive medical vocabulary in order to communicate effectively with other health care professionals. The student is expected to:	(D) analyze unfamiliar terms using the knowledge of word roots, suffixes, and prefixes	(i) analyze unfamiliar terms using the knowledge of word roots

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student uses a comprehensive medical vocabulary in order to communicate effectively with other health care professionals. The student is expected to:	(D) analyze unfamiliar terms using the knowledge of word roots, suffixes, and prefixes	(ii) analyze unfamiliar terms using the knowledge of suffixes
(5) The student uses a comprehensive medical vocabulary in order to communicate effectively with other health care professionals. The student is expected to:	(D) analyze unfamiliar terms using the knowledge of word roots, suffixes, and prefixes	(iii) analyze unfamiliar terms using the knowledge of prefixes
(6) The student demonstrates mathematical knowledge and skills to solve problems with systems of measurement used in the pharmacy. The student is expected to:	(A) analyze medication calculations, including metric, apothecary, and household systems	(i) analyze medication calculations, including metric systems
(6) The student demonstrates mathematical knowledge and skills to solve problems with systems of measurement used in the pharmacy. The student is expected to:	(A) analyze medication calculations, including metric, apothecary, and household systems	(ii) analyze medication calculations, including apothecary systems
(6) The student demonstrates mathematical knowledge and skills to solve problems with systems of measurement used in the pharmacy. The student is expected to:	(A) analyze medication calculations, including metric, apothecary, and household systems	(iii) analyze medication calculations, including household systems
(6) The student demonstrates mathematical knowledge and skills to solve problems with systems of measurement used in the pharmacy. The student is expected to:	(B) convert a measurement expressed in one standard unit within a system to a measurement expressed in another unit within the same system	(i) convert a measurement expressed in one standard unit within a system to a measurement expressed in another unit within the same system

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student demonstrates mathematical knowledge and skills to solve problems with systems of measurement used in the pharmacy. The student is expected to:	(C) convert a measurement expressed in one system to a unit of the same measurement in a different system	(i) convert a measurement expressed in one system to a unit of the same measurement in a different system
(7) The student recognizes the effectiveness of a pharmaceutical agent, its form, and its route of administration. The student is expected to:	(A) differentiate between solid, semi-solid, and liquid dosage forms	(i) differentiate between solid, semi-solid, and liquid dosage forms
(7) The student recognizes the effectiveness of a pharmaceutical agent, its form, and its route of administration. The student is expected to:	(B) name forms in which drugs are manufactured, including their subcategories	(i) name forms in which drugs are manufactured, including their subcategories
(7) The student recognizes the effectiveness of a pharmaceutical agent, its form, and its route of administration. The student is expected to:	(C) list examples of drugs in each dosage form	(i) list examples of drugs in each dosage form
(7) The student recognizes the effectiveness of a pharmaceutical agent, its form, and its route of administration. The student is expected to:	(D) define medical terms associated with drug forms	(i) define medical terms associated with drug forms
(8) The student must be able to select appropriate equipment and instruments and use technology for specific tasks. The student is expected to:	(A) identify technology components used in the pharmacy	(i) identify technology components used in the pharmacy
(8) The student must be able to select appropriate equipment and instruments and use technology for specific tasks. The student is expected to:	(B) describe how technology applications approve efficiency in the pharmacy	(i) describe how technology applications approve efficiency in the pharmacy

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student must be able to select appropriate equipment and instruments and use technology for specific tasks. The student is expected to:	(C) analyze the use of technology in the pharmacy	(i) analyze the use of technology in the pharmacy
(9) The student is expected to practice safety in dispensing and administering pharmaceutical agents and prevent personal and client illness or injury. The student is expected to:	(A) employ safety standards	(i) employ safety standards
(9) The student is expected to practice safety in dispensing and administering pharmaceutical agents and prevent personal and client illness or injury. The student is expected to:	(B) interpret rules associated with pharmacy standards	(i) interpret rules associated with pharmacy standards
(9) The student is expected to practice safety in dispensing and administering pharmaceutical agents and prevent personal and client illness or injury. The student is expected to:	(C) examine unsafe practices	(i) examine unsafe practices
(9) The student is expected to practice safety in dispensing and administering pharmaceutical agents and prevent personal and client illness or injury. The student is expected to:	(D) observe safe procedures in the administration of client care	(i) observe safe procedures in the administration of client care
(9) The student is expected to practice safety in dispensing and administering pharmaceutical agents and prevent personal and client illness or injury. The student is expected to:	(E) demonstrate these safe procedures in the clinical setting	(i) demonstrate these safe procedures in the clinical setting

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.231. Health Science Theory (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 10-12. Prerequisites: Principles of Health Science and Biology. Recommended corequisite: Health Science Clinical. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Health Science Theory course is designed to provide for the development of advanced knowledge and skills related to a wide variety of health careers. Students will employ hands-on experiences for continued knowledge and skill development.
(4) To pursue a career in the health science industry, students should recognize, learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.
(5) The health science industry is comprised of diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems that function individually and collaboratively to provide comprehensive health care. Students should identify the employment opportunities, technology, and safety requirements of each system. Students are expected to apply the knowledge and skills necessary to pursue a health science career through further education and employment.
(6) Professional integrity in the health science industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.
(7) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(8) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas in a clear, concise, and effective manner	(i) express ideas in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(A) solve mathematical calculations appropriate to situations in a health-related environment	(i) solve mathematical calculations appropriate to situations in a health-related environment
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(B) communicate using medical terminology	(i) communicate using medical terminology
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(C) express ideas in writing and develop skills in documentation	(i) express ideas in writing

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(C) express ideas in writing and develop skills in documentation	(ii) develop skills in documentation
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) interpret complex technical material related to the health science industry	(i) interpret complex technical material related to the health science industry
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(E) summarize biological and chemical processes that maintain homeostasis	(i) summarize biological processes that maintain homeostasis
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(E) summarize biological and chemical processes that maintain homeostasis	(ii) summarize chemical processes that maintain homeostasis
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain the changes in structure and function due to trauma and disease	(i) explain the changes in structure due to trauma
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain the changes in structure and function due to trauma and disease	(ii) explain the changes in structure due to disease
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain the changes in structure and function due to trauma and disease	(iii) explain the changes in function due to trauma

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain the changes in structure and function due to trauma and disease	(iv) explain the changes in function due to disease
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(G) research the global impact of disease prevention and cost containment	(i) research the global impact of disease prevention
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(G) research the global impact of disease prevention and cost containment	(ii) research the global impact of cost containment
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(A) demonstrates therapeutic communication appropriate to the situation	(i) demonstrates therapeutic communication appropriate to the situation
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(i) execute verbal skills when communicating with persons with sensory loss in a simulated setting
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(ii) execute verbal skills when communicating with persons with language barriers in a simulated setting
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(iii) execute nonverbal skills when communicating with persons with sensory loss in a simulated setting

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(iv) execute nonverbal skills when communicating with persons with language barriers in a simulated setting
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(C) use electronic communication devices with appropriate supervision in the classroom setting such as facsimile, scanner, electronic mail, and telephone	(i) use electronic communication devices with appropriate supervision in the classroom setting
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(A) evaluate how healthy relationships influence career goals	(i) evaluate how healthy relationships influence career goals
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(B) demonstrate communication skills in building and maintaining healthy relationships	(i) demonstrate communication skills in building healthy relationships
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(B) demonstrate communication skills in building and maintaining healthy relationships	(ii) demonstrate communication skills in maintaining healthy relationships
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(C) demonstrate strategies for communicating needs, wants, and emotions	(i) demonstrate strategies for communicating needs
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(C) demonstrate strategies for communicating needs, wants, and emotions	(ii) demonstrate strategies for communicating wants

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(C) demonstrate strategies for communicating needs, wants, and emotions	(iii) demonstrate strategies for communicating emotions
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(D) evaluate the effectiveness of conflict resolution techniques in various simulated situations	(i) evaluate the effectiveness of conflict resolution techniques in various simulated situations
(5) The student relates appropriate information to the proper authority in a simulated classroom setting. The student is expected to:	(A) identify and retrieve reportable information	(i) identify reportable information
(5) The student relates appropriate information to the proper authority in a simulated classroom setting. The student is expected to:	(A) identify and retrieve reportable information	(ii) retrieve reportable information
(5) The student relates appropriate information to the proper authority in a simulated classroom setting. The student is expected to:	(B) report simulated information according to facility policy	(i) report simulated information according to facility policy
(6) The student identifies documents integrated into the permanent record of the health informatics system. The student is expected to:	(A) research document formats	(i) research document formats
(6) The student identifies documents integrated into the permanent record of the health informatics system. The student is expected to:	(B) compile and record data according to industry-based standards	(i) compile data according to industry-based standards

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student identifies documents integrated into the permanent record of the health informatics system. The student is expected to:	(B) compile and record data according to industry-based standards	(ii) record data according to industry-based standards
(7) The student describes academic requirements necessary for employment in the health science industry. The student is expected to:	(A) research specific health science careers	(i) research specific health science careers
(7) The student describes academic requirements necessary for employment in the health science industry. The student is expected to:	(B) examine employment procedures for a specific health science career	(i) examine employment procedures for a specific health science career
(8) The student identifies problems and participates in the decision making process. The student is expected to:	(A) analyze systematic procedures for problem solving	(i) analyze systematic procedures for problem solving
(8) The student identifies problems and participates in the decision making process. The student is expected to:	(B) evaluate the impact of decisions	(i) evaluate the impact of decisions
(8) The student identifies problems and participates in the decision making process. The student is expected to:	(C) suggest modifications based on decision outcomes	(i) suggest modifications based on decision outcomes
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(A) comply with specific industry standards related to safety and substance abuse	(i) comply with specific industry standards related to safety

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(A) comply with specific industry standards related to safety and substance abuse	(ii) comply with specific industry standards related to substance abuse
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(B) model industry expectations of professional conduct such as attendance, punctuality, personal appearance, hygiene, and time management	(i) model industry expectations of professional conduct
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(C) articulate comprehension of assignment	(i) articulate comprehension of assignment
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(D) employ medical vocabulary specific to the health care setting	(i) employ medical vocabulary specific to the health care setting
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(E) perform admission, discharge, and transfer functions in a simulated setting	(i) perform admission functions in a simulated setting
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(E) perform admission, discharge, and transfer functions in a simulated setting	(ii) perform discharge functions in a simulated setting
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(E) perform admission, discharge, and transfer functions in a simulated setting	(iii) perform transfer functions in a simulated setting

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(F) demonstrate skills related to activities of daily living in rehabilitative care such as range of motion, positioning, and ambulation according to health science industry standards, regulatory agency standards, and professional guidelines	(i) demonstrate skills related to activities of daily living in rehabilitative care according to health science industry standards
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(F) demonstrate skills related to activities of daily living in rehabilitative care such as range of motion, positioning, and ambulation according to health science industry standards, regulatory agency standards, and professional guidelines	(ii) demonstrate skills related to activities of daily living in rehabilitative care according to health science regulatory agency standards
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(F) demonstrate skills related to activities of daily living in rehabilitative care such as range of motion, positioning, and ambulation according to health science industry standards, regulatory agency standards, and professional guidelines	(iii) demonstrate skills related to activities of daily living in rehabilitative care according to health science professional guidelines
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(G) role play techniques used in stressful situations such as trauma and chronic and terminal illness	(i) role play techniques used in stressful situations
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(i) demonstrate first aid skills in a laboratory setting
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(ii) demonstrate vital signs skills in a laboratory setting

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(iii) demonstrate cardiopulmonary resuscitation skills in a laboratory setting
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(iv) demonstrate automated external defibrillator skills in a laboratory setting
(9) The student implements the knowledge and skills of a health science professional in the classroom setting. The student is expected to:	(I) perform skills specific to a health science professional such as medical assistant, dental assistant, emergency medical technician-basic, phlebotomy technician, and pharmacy technician	(i) perform skills specific to a health science professional
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(i) research the role of professional associations
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(ii) research the role of regulatory agencies
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(iii) describe the role of professional associations
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(iv) describe the role of regulatory agencies

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(B) examine legal and ethical behavior standards such as Patient Bill of Rights, Advanced Directives, and Health Insurance Portability and Accountability Act	(i) examine legal behavior standards
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(B) examine legal and ethical behavior standards such as Patient Bill of Rights, Advanced Directives, and Health Insurance Portability and Accountability Act	(ii) examine ethical behavior standards
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(C) investigate the legal and ethical ramifications of unacceptable behavior	(i) investigate the legal ramifications of unacceptable behavior
(10) The student evaluates ethical behavioral standards and legal responsibilities. The student is expected to:	(C) investigate the legal and ethical ramifications of unacceptable behavior	(ii) investigate the ethical ramifications of unacceptable behavior
(11) The student exhibits the leadership skills necessary to function in a democratic society. The student is expected to:	(A) identify leadership skills of health science professionals	(i) identify leadership skills of health science professionals
(11) The student exhibits the leadership skills necessary to function in a democratic society. The student is expected to:	(B) participate in group dynamics	(i) participate in group dynamics
(11) The student exhibits the leadership skills necessary to function in a democratic society. The student is expected to:	(C) integrate consensus-building techniques	(i) integrate consensus-building techniques

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student maintains a safe environment. The student is expected to:	(A) conform to governmental regulations and guidelines from entities such as the World Health Organization, Centers for Disease Control and Prevention, Occupational Safety and Health Administration, U.S. Food and Drug Administration, Joint Commission, and National Institute of Health	(i) conform to governmental regulations from [various] entities
(12) The student maintains a safe environment. The student is expected to:	(A) conform to governmental regulations and guidelines from entities such as the World Health Organization, Centers for Disease Control and Prevention, Occupational Safety and Health Administration, U.S. Food and Drug Administration, Joint Commission, and National Institute of Health	(ii) conform to governmental guidelines from [various] entities
(12) The student maintains a safe environment. The student is expected to:	(B) explain protocol related to hazardous materials and situations	(i) explain protocol related to hazardous materials
(12) The student maintains a safe environment. The student is expected to:	(B) explain protocol related to hazardous materials and situations	(ii) explain protocol related to hazardous situations
(12) The student maintains a safe environment. The student is expected to:	(C) observe and report unsafe conditions	(i) observe unsafe conditions
(12) The student maintains a safe environment. The student is expected to:	(C) observe and report unsafe conditions	(ii) report unsafe conditions
(12) The student maintains a safe environment. The student is expected to:	(D) support recycling and waste management for cost containment and environmental protection	(i) support recycling for cost containment

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student maintains a safe environment. The student is expected to:	(D) support recycling and waste management for cost containment and environmental protection	(ii) support recycling for environmental protection
(12) The student maintains a safe environment. The student is expected to:	(D) support recycling and waste management for cost containment and environmental protection	(iii) support waste management for cost containment
(12) The student maintains a safe environment. The student is expected to:	(D) support recycling and waste management for cost containment and environmental protection	(iv) support waste management for environmental protection
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(A) research wellness strategies for the prevention of disease	(i) research wellness strategies for the prevention of disease
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(i) evaluate positive effects of relationships on physical health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(i) evaluate positive effects of relationships on emotional health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(ii) evaluate negative effects of relationships on physical health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(ii) evaluate negative effects of relationships on emotional health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(C) explain the benefits of positive relationships among community health professionals in promoting a healthy community	(i) explain the benefits of positive relationships among community health professionals in promoting a healthy community

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(D) research and analyze the effects of access to quality health care	(i) research the effects of access to quality health care
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(D) research and analyze the effects of access to quality health care	(ii) analyze the effects of access to quality health care
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(E) research alternative health practices and therapies	(i) research alternative health practices
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(E) research alternative health practices and therapies	(ii) research alternative health therapies

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.232. Health Science Clinical (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 10-12. Prerequisites: Biology and Principles of Health Science. Corequisite: Health Science Theory. This course must be taken concurrently with Health Science Theory and may not be taken as a stand-alone course. Districts are encouraged to offer this course in a consecutive block with Health Science Theory to allow students sufficient time to master the content of both courses. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Health Science Clinical course is designed to provide for the development of advanced knowledge and skills related to a wide variety of health careers. Students will employ hands-on experiences for continued knowledge and skill development.
(4) To pursue a career in the health science industry, students should recognize, learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.
(5) The health science industry is comprised of diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems that function individually and collaboratively to provide comprehensive health care. Students should identify the employment opportunities, technology, and safety requirements of each system. Students are expected to apply the knowledge and skills necessary to pursue a health science career through further education and employment.
(6) Professional integrity in the health science industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.
(7) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(8) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.		
Knowledge and Skill Statement	**Student Expectation**	**Breakout**
(1) The student demonstrates professional standards/employability skills as requires by business and industry. The student is expected to:	(A) express ideas in a clear, concise, and effective manner	(i) express ideas in a clear, concise, and effective manner
(1) The student demonstrates professional standards/employability skills as requires by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team.	(i) exhibit the ability to cooperate as a member of a team
(1) The student demonstrates professional standards/employability skills as requires by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as requires by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(A) solve mathematical calculations appropriate to situations in a health-related environment	(i) solve mathematical calculations appropriate to situations in a health-related environment
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(B) communicate using medical terminology	(i) communicate using medical terminology
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(C) express ideas in writing and develop skills in documentation	(i) express ideas in writing

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(C) express ideas in writing and develop skills in documentation	(ii) develop skills in documentation
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(D) interpret complex technical material related to the health science industry	(i) interpret complex technical material related to the health science industry
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(E) summarize biological and chemical processes that maintain homeostasis	(i) summarize biological processes that maintain homeostasis
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(E) summarize biological and chemical processes that maintain homeostasis	(ii) summarize chemical processes that maintain homeostasis
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain changes in structure and function due to trauma and disease	(i) explain changes in structure due to trauma
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain changes in structure and function due to trauma and disease	(ii) explain changes in structure due to disease
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain changes in structure and function due to trauma and disease	(iii) explain changes in function due to trauma

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(F) explain changes in structure and function due to trauma and disease	(ivi) explain changes in function due to disease
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(G) research the global impact of disease prevention and cost containment	(i) research the global impact of disease prevention
(2) The student applies mathematics, science, English language arts, and social studies in health science. The student is expected to:	(G) research the global impact of disease prevention and cost containment	(ii) research the global impact of cost containment
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(A) demonstrate therapeutic communication appropriate to the situation	(i) demonstrate therapeutic communication appropriate to the situation
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(i) execute verbal skills when communicating with persons with sensory loss in a simulated setting
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(ii) execute verbal skills when communicating with persons with language barriers in a simulated setting
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(iii) execute nonverbal skills when communicating with persons with sensory loss in a simulated setting

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(B) execute verbal and nonverbal skills when communicating with persons with sensory loss and language barriers in a simulated setting	(iv) execute nonverbal skills when communicating with persons with language barriers in a simulated setting
(3) The student displays verbal and non-verbal communication skills. The student is expected to:	(C) use electronic communication devices with appropriate supervision such as facsimile, scanner, electronic mail, and telephone	(i) use electronic communication devices with appropriate supervision
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(A) evaluate how a healthy relationship influences career goals	(i) evaluate how a healthy relationship influences career goals
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(B) demonstrate communication skills in building and maintaining healthy relationships	(i) demonstrate communication skills in building healthy relationships
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(B) demonstrate communication skills in building and maintaining healthy relationships	(ii) demonstrate communication skills in maintaining healthy relationships
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(C) demonstrate strategies for communicating needs, wants, and emotions	(i) demonstrate strategies for communicating needs
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(C) demonstrate strategies for communicating needs, wants, and emotions	(ii) demonstrate strategies for communicating wants

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(C) demonstrate strategies for communicating needs, wants, and emotions	(iii) demonstrate strategies for communicating emotions
(4) The student analyzes and evaluates communication skills for maintaining healthy relationships throughout the life span. The student is expected to:	(D) evaluate the effectiveness of conflict resolution techniques in various practical situations	(i) evaluate the effectiveness of conflict resolution techniques in various practical situations
(5) The student relates appropriate information in the practical setting to the proper authority. The student is expected to:	(A) identify and retrieve reportable information	(i) identify reportable information
(5) The student relates appropriate information in the practical setting to the proper authority. The student is expected to:	(A) identify and retrieve reportable information	(ii) retrieve reportable information
(5) The student relates appropriate information in the practical setting to the proper authority. The student is expected to:	(B) report information according to facility policy in the practical setting	(i) report information according to facility policy in the practical setting
(6) The student identifies documents integrated into the permanent record of health informatics system. The student is expected to:	(A) research and describe document formats	(i) research document formats
(6) The student identifies documents integrated into the permanent record of health informatics system. The student is expected to:	(A) research and describe document formats	(ii) describe document formats

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student identifies documents integrated into the permanent record of health informatics system. The student is expected to:	(B) compile and record data according to industry-based standards	(i) compile data according to industry-based standards
(6) The student identifies documents integrated into the permanent record of health informatics system. The student is expected to:	(B) compile and record data according to industry-based standards	(ii) record data according to industry-based standards
(7) The student describes academic requirements necessary for employment in the health science industry. The student is expected to:	(A) research specific health science careers	(i) research specific health science careers
(7) The student describes academic requirements necessary for employment in the health science industry. The student is expected to:	(B) review employment procedures for a specific health science career	(i) review employment procedures for a specific health science career
(8) The student identifies problems and participates in the decision-making process. The student is expected to:	(A) analyze systematic procedures for problem solving	(i) analyze systematic procedures for problem solving
(8) The student identifies problems and participates in the decision-making process. The student is expected to:	(B) evaluate the impact of decisions	(i) evaluate the impact of decisions
(8) The student identifies problems and participates in the decision-making process. The student is expected to:	(C) suggest modifications based on decision outcomes	(i) suggest modifications based on decision outcomes

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(A) comply with specific industry standards related to safety and substance abuse	(i) comply with specific industry standards related to safety
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(A) comply with specific industry standards related to safety and substance abuse	(ii) comply with specific industry standards related to substance abuse
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(B) model industry expectations of professional conduct such as attendance, punctuality, personal appearance, hygiene, and time management	(i) model industry expectations of professional conduct
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(C) articulate comprehension of assignment	(i) articulate comprehension of assignment
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(D) employ medical vocabulary specific to the health care setting	(i) employ medical vocabulary specific to the health care setting
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(E) perform admission, discharge, and transfer functions in a simulated setting	(i) perform admission functions in a simulated setting
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(E) perform admission, discharge, and transfer functions in a simulated setting	(ii) perform discharge functions in a simulated setting

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(E) perform admission, discharge, and transfer functions in a simulated setting	(iii) perform transfer functions in a simulated setting
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(F) demonstrate skills related to activities of daily living in rehabilitative care such as range of motion, positioning, and ambulation according to health science industry standards, regulatory agency standards, and professional guidelines	(i) demonstrate skills related to activities of daily living in rehabilitative care according to health science industry standards
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(F) demonstrate skills related to activities of daily living in rehabilitative care such as range of motion, positioning, and ambulation according to health science industry standards, regulatory agency standards, and professional guidelines	(ii) demonstrate skills related to activities of daily living in rehabilitative care according to health science regulatory agency standards
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(F) demonstrate skills related to activities of daily living in rehabilitative care such as range of motion, positioning, and ambulation according to health science industry standards, regulatory agency standards, and professional guidelines	(iii) demonstrate skills related to activities of daily living in rehabilitative care according to health science professional guidelines
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(G) role play techniques used in stressful situations such as trauma, chronic, and terminal illness	(i) role play techniques used in stressful situations
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(i) demonstrate first aid skills in a laboratory setting

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(ii) demonstrate vital signs skills in a laboratory setting
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(iii) demonstrate cardiopulmonary resuscitation skills in a laboratory setting
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(H) demonstrate first aid, vital signs, cardiopulmonary resuscitation, and automated external defibrillator skills in a laboratory setting	(iv) demonstrate automated external defibrillator skills in a laboratory setting
(9) The student implements the knowledge and skills of a health professional in the clinical setting. The student is expected to:	(I) perform skills specific to a health science professional such as medical assistant, dental assistant, emergency medical technician-basic, phlebotomy technician, and pharmacy technician	(i) perform skills specific to a health science professional
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(i) research the role of professional associations
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(ii) research the role of regulatory agencies
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(iii) describe the role of professional associations
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(A) research and describe the role of professional associations and regulatory agencies	(iv) describe the role of regulatory agencies

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(B) examine legal and ethical behavior standards such as Patient Bill of Rights, Advanced Directives, and the Health Insurance Portability and Accountability Act	(i) examine legal behavior standards
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(B) examine legal and ethical behavior standards such as Patient Bill of Rights, Advanced Directives, and the Health Insurance Portability and Accountability Act	(ii) examine ethical behavior standards
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(C) investigate the legal and ethical ramifications of unacceptable behavior	(i) investigate the legal ramifications of unacceptable behavior
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(C) investigate the legal and ethical ramifications of unacceptable behavior	(ii) investigate the ethical ramifications of unacceptable behavior
(10) The student evaluates ethical behavior standards and legal responsibilities. The student is expected to:	(D) perform within the designated scope of practice	(i) perform within the designated scope of practice
(11) The student exhibits the leadership skills necessary to function in a democratic society. The student is expected to:	(A) identify leadership skills of health science professionals	(i) identify leadership skills of health science professionals
(11) The student exhibits the leadership skills necessary to function in a democratic society. The student is expected to:	(B) participate in group dynamics	(i) participate in group dynamics
(11) The student exhibits the leadership skills necessary to function in a democratic society. The student is expected to:	(C) integrate consensus building techniques	(i) integrate consensus building techniques

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student maintains a safe environment. The student is expected to:	(A) conform to governmental regulations and guidelines from entities such as the World Health Organization, Centers for Disease Control and Prevention, Occupational Safety and Health Administration, U.S. Food and Drug Administration, Joint Commission, and National Institute of Health	(i) conform to governmental regulations and guidelines from [various] entities
(12) The student maintains a safe environment. The student is expected to:	(B) explain protocol related to hazardous materials and situations such as material safety data sheets	(i) explain protocol related to hazardous materials
(12) The student maintains a safe environment. The student is expected to:	(B) explain protocol related to hazardous materials and situations such as material safety data sheets	(ii) explain protocol related to hazardous situations
(12) The student maintains a safe environment. The student is expected to:	(C) observe and report unsafe conditions	(i) observe unsafe conditions
(12) The student maintains a safe environment. The student is expected to:	(C) observe and report unsafe conditions	(ii) report unsafe conditions
(12) The student maintains a safe environment. The student is expected to:	(D) practice recycling and waste management for cost containment and environmental protection	(i) practice recycling for cost containment
(12) The student maintains a safe environment. The student is expected to:	(D) practice recycling and waste management for cost containment and environmental protection	(ii) practice recycling for environmental protection
(12) The student maintains a safe environment. The student is expected to:	(D) practice recycling and waste management for cost containment and environmental protection	(iii) practice waste management for cost containment

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student maintains a safe environment. The student is expected to:	(D) practice recycling and waste management for cost containment and environmental protection	(iv) practice waste management for environmental protection
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(A) research wellness strategies for the prevention of disease	(i) research wellness strategies for the prevention of disease
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(i) evaluate positive effects of relationships on physical health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(ii) evaluate positive effects of relationships on emotional health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(iii) evaluate negative effects of relationships on physical health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(B) evaluate positive and negative effects of relationships on physical and emotional health	(iv) evaluate negative effects of relationships on emotional health
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(C) explain the benefits of positive relationships among community health professionals in promoting a healthy community	(i) explain the benefits of positive relationships among community health professionals in promoting a healthy community
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(D) research and analyze access to quality health care	(i) research access to quality health care
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(D) research and analyze access to quality health care	(ii) analyze access to quality health care

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(E) research alternative health practices and therapies	(i) research alternative health practices
(13) The student assesses wellness strategies for the prevention of disease. The student is expected to:	(E) research alternative health practices and therapies	(ii) research alternative health therapies

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.233. Practicum in Health Science (Two Credits), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: Principles of Health Science, Health Science Theory, and Biology.
(1) A student shall be awarded two credits for successful completion of this course when the student participates in at least an average of 10 hours, but less than 15 hours, per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Health Science Career Cluster.
(2) A student shall be awarded three credits for successful completion of this course when the student participates in an average of 15 hours per week of a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to the Health Science Career Cluster.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Practicum in Health Science I course is designed to give students practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience.
(4) To pursue a career in the health care industry, students should learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.
(5) The health care industry is comprised of diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems that function individually and collaboratively to provide comprehensive health care. Students recognize the employment opportunities, technology, and safety requirements of each system. Students are expected to apply the knowledge and skills necessary to pursue a health science certification or licensure through further education and employment.
(6) Professional integrity in the health care industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.
(7) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(8) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(i) demonstrate verbal communication in a clear manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(ii) demonstrate verbal communication in a concise manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(iii) demonstrate verbal communication in a[n] effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(iv) demonstrate non-verbal communication in a clear manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(v) demonstrate non-verbal communication in a concise manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate verbal and non-verbal communication in a clear, concise, and effective manner	(vi) demonstrate non-verbal communication in a[n] effective manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(i) exhibit the ability to cooperate as a member of a team

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(ii) exhibit the ability to contribute as a member of a team
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) exhibit the ability to cooperate, contribute, and collaborate as a member of a team	(iii) exhibit the ability to collaborate as a member of a team
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(A) interpret data from various sources in formulating conclusions	(i) interpret data from various sources in formulating conclusions
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(B) compile information from a variety of sources to create a technical report	(i) compile information from a variety of sources to create a technical report
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(C) plan, prepare, and deliver a presentation	(i) plan a presentation
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(C) plan, prepare, and deliver a presentation	(ii) prepare a presentation
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(C) plan, prepare, and deliver a presentation	(iii) deliver a presentation

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(D) examine the environmental factors that affect homeostasis	(i) examine the environmental factors that affect homeostasis
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(E) relate anatomical structure to physiological functions	(i) relate anatomical structure to physiological functions
(2) The student applies mathematics, science, English language arts, and social sciences in health science. The student is expected to:	(F) distinguish atypical anatomy and physiology in the human body systems	(i) distinguish atypical anatomy and physiology in the human body systems
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(A) accurately report information according to facility policies and procedures	(i) accurately report information according to facility policies and procedures
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(B) demonstrate therapeutic communication skills to provide quality care	(i) demonstrate therapeutic communication skills to provide quality care
(3) The student uses verbal and non-verbal communication skills. The student is expected to:	(C) employ therapeutic measures to minimize communication barriers	(i) employ therapeutic measures to minimize communication barriers
(4) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to:	(A) demonstrate proficiency in medical terminology and skills related to the health care of an individual	(i) demonstrate proficiency in medical terminology related to the health care of an individual
(4) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to:	(A) demonstrate proficiency in medical terminology and skills related to the health care of an individual	(ii) demonstrate proficiency in medical skills related to the health care of an individual

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to:	(B) develop new problem-solving strategies based on previous knowledge and skills	(i) develop new problem-solving strategies based on previous knowledge and skills
(4) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to:	(C) evaluate performance for continuous improvement and advancement in health care	(i) evaluate performance for continuous improvement in health care
(4) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to:	(C) evaluate performance for continuous improvement and advancement in health care	(ii) evaluate performance for continuous advancement in health care
(5) The student employs ethical behavior standards and legal responsibilities. The student is expected to:	(A) identify individual ethical and legal behavior standards according to professional regulatory agencies	(i) identify individual ethical behavior standards according to professional regulatory agencies
(5) The student employs ethical behavior standards and legal responsibilities. The student is expected to:	(A) identify individual ethical and legal behavior standards according to professional regulatory agencies	(ii) identify individual legal behavior standards according to professional regulatory agencies
(5) The student employs ethical behavior standards and legal responsibilities. The student is expected to:	(B) research case studies related to unethical behavior in the healthcare industry	(i) research case studies related to unethical behavior in the healthcare industry
(6) The student employs a safe environment to prevent hazardous situations. The student is expected to:	(A) integrate regulatory standards such as standard precautions and safe patient handling	(i) integrate regulatory standards
(6) The student employs a safe environment to prevent hazardous situations. The student is expected to:	(B) evaluate hazardous materials according to the material safety data sheets	(i) evaluate hazardous materials according to the material safety data sheets

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student employs a safe environment to prevent hazardous situations. The student is expected to:	(C) apply principles of infection control and body mechanics in all aspects of the health care industry	(i) apply principles of infection control in all aspects of the health care industry
(6) The student employs a safe environment to prevent hazardous situations. The student is expected to:	(C) apply principles of infection control and body mechanics in all aspects of the health care industry	(ii) apply principles of body mechanics in all aspects of the health care industry
(7) The student explores the knowledge and skill levels necessary for advancing in the health care professions. The student is expected to:	(A) identify knowledge and skills that are transferable among health care professions	(i) identify knowledge that [is] transferable among health care professions
(7) The student explores the knowledge and skill levels necessary for advancing in the health care professions. The student is expected to:	(A) identify knowledge and skills that are transferable among health care professions	(ii) identify skills that are transferable among health care professions
(7) The student explores the knowledge and skill levels necessary for advancing in the health care professions. The student is expected to:	(B) research career pathways pertaining to the health care industry	(i) research career pathways pertaining to the health care industry
(8) The student implements skills in monitoring individual health status during therapeutic or diagnostic procedures. The student is expected to:	(A) identify care indicators of health status	(i) identify care indicators of health status
(8) The student implements skills in monitoring individual health status during therapeutic or diagnostic procedures. The student is expected to:	(B) record health status according to facility protocol	(i) record health status according to facility protocol
(9) The student recognizes the importance of participation in extended learning experiences. The student is expected to:	(A) participate in extended learning experiences such as community service, in career and technical student organizations, and professional organizations	(i) participate in extended learning experiences

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student recognizes the importance of participation in extended learning experiences. The student is expected to:	(B) create a plan of action targeting the career and technical student organization's community service goal	(i) create a plan of action targeting the career and technical student organization's community service goal

Subject	**Chapter 130. Career and Technical Education, Subchapter H. Health Science**
Course Title	**§130.234. Extended Practicum in Health Science (One Credit), Adopted 2015.**

(a) General Requirements. This course is recommended for students in Grades 11 and 12. The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Health Science Career Cluster. Prerequisites: Principles of Health Science, Health Science Theory, and Biology. Corequisite: Practicum in Health Science. This course must be taken concurrently with Practicum in Health Science and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
(2) The Health Science Career Cluster focuses on planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
(3) The Extended Practicum in Health Science course is designed to give students practical application of previously studied knowledge and skills. Practicum experiences can occur in a variety of locations appropriate to the nature and level of experience.
(4) To pursue a career in the health science industry, students should learn to reason, think critically, make decisions, solve problems, and communicate effectively. Students should recognize that quality health care depends on the ability to work well with others.
(5) The health science industry is comprised of diagnostic, therapeutic, health informatics, support services, and biotechnology research and development systems that function individually and collaboratively to provide comprehensive health care. Students should identify the employment opportunities, technology, and safety requirements of each system. Students are expected to apply the knowledge and skills necessary to pursue a health science career through further education and employment.
(6) Professional integrity in the health science industry is dependent on acceptance of ethical and legal responsibilities. Students are expected to employ their ethical and legal responsibilities, recognize limitations, and understand the implications of their actions.
(7) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
(8) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.		
Knowledge and Skill Statement	**Student Expectation**	**Breakout**
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to health science	(i) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge related to health science
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to health science	(ii) participate in a paid or unpaid, laboratory- or work-based application of previously studied skills related to health science
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment	(i) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, commitment, leadership, appreciation for diversity, customer service, and adaptability with increased fluency	(i) demonstrate professional standards needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, commitment, leadership, appreciation for diversity, customer service, and adaptability with increased fluency	(ii) demonstrate personal qualities needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(i) employ teamwork skills with increased fluency to achieve collective goals

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(ii) employ conflict-management skills with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(i) employ planning skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(ii) employ planning skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iii) employ planning tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iv) employ planning tools with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(v) employ time-management skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vi) employ time-management skills with increased fluency to complete work tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vii) employ time-managment tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(viii) employ time-management tools with increased fluency to complete work tasks
(2) The student applies professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(i) demonstrate verbal communication consistently in a clear, concise, and effective manner
(2) The student applies professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication consistently in a clear, concise, and effective manner
(2) The student applies professional communications strategies. The student is expected to:	(B) report information according to facility policies and procedures accurately	(i) report information according to facility policies accurately
(2) The student applies professional communications strategies. The student is expected to:	(B) report information according to facility policies and procedures accurately	(ii) report information according to facility procedures accurately
(2) The student applies professional communications strategies. The student is expected to:	(C) demonstrate therapeutic communication skills with increased fluency to provide quality care	(i) demonstrate therapeutic communication skills with increased fluency to provide quality care
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(i) analyze information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(ii) analyze data

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(iii) analyze observations
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(iv) interpret information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(v) interpret data
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(vi) interpret observations
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(vii) effectively communicate information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(viii) effectively communicate data
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(ix) effectively communicate observations
(2) The student applies professional communications strategies. The student is expected to:	(E) apply active listening skills to obtain and clarify information	(i) apply active listening skills to obtain information
(2) The student applies professional communications strategies. The student is expected to:	(E) apply active listening skills to obtain and clarify information	(ii) apply active listening skills to clarify information

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(i) observe verbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(ii) observe nonverbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iii) observe verbal behaviors to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iv) observe nonverbal behaviors to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(v) interpret verbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vi) interpret nonverbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vii) interpret verbal behaviors to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(F) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(viii) interpret nonverbal behaviors to enhance communication
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(i) employ critical-thinking skills with increased fluency independently to solve problems

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(ii) employ critical-thinking skills with increased fluency in groups to solve problems
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iii) employ critical-thinking skills with increased fluency independently to make decisions
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iv) employ critical-thinking skills with increased fluency in groups to make decisions
(4) The student understands and applies proper safety techniques in the workplace to prevent hazardous situations. The student is expected to:	(A) demonstrate an understanding of and follow workplace safety rules and regulations	(i) demonstrate an understanding of workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace to prevent hazardous situations. The student is expected to:	(A) demonstrate an understanding of and follow workplace safety rules and regulations	(ii) follow workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace to prevent hazardous situations. The student is expected to:	(B) implement regulatory standards such as standard precautions and safe patient handling with increased fluency	(i) implement regulatory standards with increased fluency
(4) The student understands and applies proper safety techniques in the workplace to prevent hazardous situations. The student is expected to:	(C) evaluate hazardous materials according to the material safety data sheets in a consistent manner	(i) evaluate hazardous materials according to the material safety data sheets in a consistent manner

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands and applies proper safety techniques in the workplace to prevent hazardous situations. The student is expected to:	(D) apply principles of infection control and body mechanics in all aspects of the health care industry	(i) apply principles of infection control in all aspects of the health care industry
(4) The student understands and applies proper safety techniques in the workplace to prevent hazardous situations. The student is expected to:	(D) apply principles of infection control and body mechanics in all aspects of the health care industry	(ii) apply principles of body mechanics in all aspects of the health care industry
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(A) demonstrate a positive, productive work ethic by performing assigned tasks as directed	(i) demonstrate a positive, productive work ethic by performing assigned tasks as directed
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(B) implement individual ethical and legal behavior standards according to professional regulatory agencies	(i) implement individual ethical behavior standards according to professional regulatory agencies
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(B) implement individual ethical and legal behavior standards according to professional regulatory agencies	(ii) implement individual legal behavior standards according to professional regulatory agencies
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(C) show integrity by choosing the ethical course of action when making decisions	(i) show integrity by choosing the ethical course of action when making decisions
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(i) comply with all applicable rules in a consistent manner

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(ii) comply with all applicable laws in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in health science. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(iii) comply with all applicable regulations in a consistent manner
(6) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to demonstrate proficiency in medical terminology and skills related to the health care of an individual.	[A] demonstrate proficiency in medical terminology and skills related to the health care of an individual	(i) demonstrate proficiency in medical terminology related to the health care of an individual
(6) The student implements the knowledge and skills of a health care professional necessary to acquire and retain employment. The student is expected to demonstrate proficiency in medical terminology and skills related to the health care of an individual.	[A] demonstrate proficiency in medical terminology and skills related to the health care of an individual	(ii) demonstrate proficiency in medical skills related to the health care of an individual
(7) The student participates in a supervised health science experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised health science experience	(i) conduct learning activities in a supervised health science experience
(7) The student participates in a supervised health science experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised health science experience	(ii) document learning activities in a supervised health science experience
(7) The student participates in a supervised health science experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised health science experience	(iii) evaluate learning activities in a supervised health science experience

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student participates in a supervised health science experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to a personal occupational objective	(i) develop advanced technical knowledge related to a personal occupational objective
(7) The student participates in a supervised health science experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to a personal occupational objective	(ii) develop advanced technical skills related to a personal occupational objective
(7) The student participates in a supervised health science experience. The student is expected to:	(C) evaluate strengths and weaknesses in technical skill proficiency	(i) evaluate strengths in technical skill proficiency
(7) The student participates in a supervised health science experience. The student is expected to:	(C) evaluate strengths and weaknesses in technical skill proficiency	(ii) evaluate weaknesses in technical skill proficiency
(7) The student participates in a supervised health science experience. The student is expected to:	(D) collect representative work samples	(i) collect representative work samples