Subject	**Chapter 112. Science**			
Course Title	**§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).**			
TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(a) General requirements. Students shall be awarded one credit for successful completion of this course. Required prerequisites: one unit of high school science and Algebra I. Suggested prerequisite: completion of or concurrent enrollment in a second year of math. This course is recommended for students in Grade 10, 11, or 12.				
(b) Introduction.				
(1) Chemistry. In Chemistry, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include characteristics of matter, use of the Periodic Table, development of atomic theory and chemical bonding, chemical stoichiometry, gas laws, solution chemistry, thermochemistry, and nuclear chemistry. Students will investigate how chemistry is an integral part of our daily lives.				
(2) Nature of Science. 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.				
(3) Scientific inquiry. Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation can be experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.				
(4) Science and social ethics. Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision making methods and ethical and social decisions that involve the application of scientific information.				
(5) Scientific systems. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in terms of 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.				
(C) Knowledge and skills.				
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(i) demonstrate safe practices during laboratory investigations, including the appropriate use of safety showers		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(ii) demonstrate safe practices during laboratory investigations, including the appropriate use of eyewash fountains		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(iii) demonstrate safe practices during laboratory investigations, including the appropriate use of safety goggles		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(iv) demonstrate safe practices during laboratory investigations, including the appropriate use of fire extinguishers		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(v) demonstrate safe practices during field investigations, including the appropriate use of safety showers		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(vi) demonstrate safe practices during field investigations, including the appropriate use of eyewash fountains		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(vii) demonstrate safe practices during field investigations, including the appropriate use of safety goggles		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles, and fire extinguishers	(viii) demonstrate safe practices during field investigations, including the appropriate use of fire extinguishers		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(B) know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Material Safety Data Sheets (MSDS)	(i) know specific hazards of chemical substances as summarized on the Material Safety Data Sheets (MSDS)		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(C) 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		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(C) 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		
(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:	(C) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials	(iii) demonstrate the proper disposal or recycling of materials		

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Course Title	§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).			
TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section	(i) know the definition of science, as specified in subsection (b)(2) [above]		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section	(ii) understand that [science] has limitations, as specified in subsection (b)(2) [above]		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(B) know that scientific 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 scientific hypotheses are tentative statements that must be capable of being supported or not supported by observational evidence		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(B) know that scientific 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 scientific hypotheses are testable statements that must be capable of being supported or not supported by observational evidence		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(B) know that scientific 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		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(2) Scientific processes. The student uses scientific methods to solve investigative questions. 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 may be subject to change as new areas of science and new technologies are developed	(i) know that scientific theories are based on natural and physical phenomena		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. 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 may be subject to change as new areas of science and new technologies are developed	(ii) know that scientific theories are capable of being tested by multiple independent researchers		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. 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 may be subject to change as new areas of science and new technologies are developed	(iii) [know that], unlike hypotheses, scientific theories are well-established explanations		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. 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 may be subject to change as new areas of science and new technologies are developed	(iv) [know that], unlike hypotheses, scientific theories are highly-reliable explanations		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. 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 may be subject to change as new areas of science and new technologies are developed	(v) [know that] scientific theories may be subject to change as new areas of science are developed		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. 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 may be subject to change as new areas of science and new technologies are developed	(vi) [know that] scientific theories may be subject to change as technologies are developed		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(D) distinguish between scientific hypotheses and scientific theories			

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(i) plan investigative procedures, including asking questions		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(ii) plan investigative procedures, including formulating testable hypotheses		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(iii) plan investigative procedures, including selecting equipment, including sufficient scientific glassware		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(iv) plan investigative procedures, including selecting equipment, including electronic balances		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(v) plan investigative procedures, including selecting equipment, including an adequate supply of consumable chemicals		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(vi) plan investigative procedures, including selecting technology, including graphing calculators		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(vii) plan investigative procedures, including selecting technology, including computers		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(viii) plan investigative procedures, including selecting technology, including probes		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(ix) implement investigative procedures, including asking questions		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(x) implement investigative procedures, including formulating testable hypotheses		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(xi) implement investigative procedures, including selecting equipment, including sufficient scientific glassware		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(xii) implement investigative procedures, including selecting equipment, including electronic balances		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(xiii) implement investigative procedures, including selecting equipment, including an adequate supply of consumable chemicals		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(xiv) implement investigative procedures, including selecting technology, including graphing calculators		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(xv) implement investigative procedures, including selecting technology, including computers		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(E) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology, including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated cylinders, volumetric flasks, safety goggles, and burettes, electronic balances, and an adequate supply of consumable chemicals	(xvi) implement investigative procedures, including selecting technology, including probes		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(F) collect data and make measurements with accuracy and precision	(i) collect data with accuracy		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(F) collect data and make measurements with accuracy and precision	(ii) collect data with precision		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(F) collect data and make measurements with accuracy and precision	(iii) make measurements with accuracy		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(F) collect data and make measurements with accuracy and precision	(iv) make measurements with precision		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(i) express chemical quantities using scientific conventions, including dimensional analysis		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(ii) express chemical quantities using mathematical procedures, including dimensional analysis		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(iii) express chemical quantities using scientific conventions, including scientific notation		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(iv) express chemical quantities using mathematical procedures, including scientific notation		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(v) express chemical quantities using scientific conventions, including significant figures		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(vi) express chemical quantities using mathematical procedures, including significant figures		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(vii) manipulate chemical quantities using mathematical procedures, including dimensional analysis		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(viii) manipulate chemical quantities using scientific conventions, including scientific notation		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(ix) manipulate chemical quantities using mathematical procedures, including scientific notation		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(x) manipulate chemical quantities using scientific conventions, including significant figures		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(G) express and manipulate chemical quantities using scientific conventions and mathematical procedures, including dimensional analysis, scientific notation, and significant figures	(xi) manipulate chemical quantities using mathematical procedures, including significant figures		

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(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(H) organize, analyze, evaluate, make inferences, and predict trends from data	(i) organize data		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(H) organize, analyze, evaluate, make inferences, and predict trends from data	(ii) analyze data		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(H) organize, analyze, evaluate, make inferences, and predict trends from data	(iii) evaluate data		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(H) organize, analyze, evaluate, make inferences, and predict trends from data	(iv) make inferences from data		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(H) organize, analyze, evaluate, make inferences, and predict trends from data	(v) predict trends from data		
(2) Scientific processes. The student uses scientific methods to solve investigative questions. The student is expected to:	(I) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports, and technology-based reports	(i) communicate valid conclusions supported by the data through [various] methods		
(3) Scientific processes. 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	(i) in all fields of science, analyze scientific explanations by using empirical evidence		

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(3) Scientific processes. 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	(ii) in all fields of science, analyze scientific explanations by using logical reasoning		
(3) Scientific processes. 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	(iii) in all fields of science, analyze scientific explanations by using experimental testing		
(3) Scientific processes. 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	(iv) in all fields of science, analyze scientific explanations by using observational testing		

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(3) Scientific processes. 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	(v) in all fields of science, analyze scientific explanations, including examining all sides of scientific evidence of those scientific explanations		
(3) Scientific processes. 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	(vi) in all fields of science, evaluate scientific explanations by using empirical evidence		
(3) Scientific processes. 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	(vii) in all fields of science, evaluate scientific explanations by using logical reasoning		

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(3) Scientific processes. 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	(viii) in all fields of science, evaluate scientific explanations by using experimental testing		
(3) Scientific processes. 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	(ix) in all fields of science, evaluate scientific explanations by using observational testing		
(3) Scientific processes. 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	(x) in all fields of science, evaluate scientific explanations, including examining all sides of scientific evidence of those scientific explanations		

Subject	Chapter 112. Science			
Course Title	§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).			
TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(3) Scientific processes. 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	(xi) in all fields of science, critique scientific explanations by using empirical evidence		
(3) Scientific processes. 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	(xii) in all fields of science, critique scientific explanations by using logical reasoning		
(3) Scientific processes. 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	(xiii) in all fields of science, critique scientific explanations by using experimental testing		

Subject	Chapter 112. Science			
Course Title	§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).			
TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(3) Scientific processes. 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	(xiv) in all fields of science, critique scientific explanations by using observational testing		
(3) Scientific processes. 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		
(3) Scientific processes. 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 current events, news reports, published journal articles, and marketing materials	(i) communicate scientific information extracted from various sources		
(3) Scientific processes. 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 current events, news reports, published journal articles, and marketing materials	(ii) apply scientific information extracted from various sources		
(3) Scientific processes. 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		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(3) Scientific processes. 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		
(3) Scientific processes. 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 research on scientific thought, society, and the environment	(i) evaluate the impact of research on scientific thought		
(3) Scientific processes. 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 research on scientific thought, society, and the environment	(ii) evaluate the impact of research on society		
(3) Scientific processes. 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 research on scientific thought, society, and the environment	(iii) evaluate the impact of research on the environment		
(3) Scientific processes. 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) describe the connection between chemistry and future careers			
(3) Scientific processes. 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 chemistry and contributions of scientists	(i) research the history of chemistry		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(3) Scientific processes. 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 chemistry and contributions of scientists	(ii) research the contributions of scientists		
(3) Scientific processes. 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 chemistry and contributions of scientists	(iii) describe the history of chemistry		
(3) Scientific processes. 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 chemistry and contributions of scientists	(iv) describe the contributions of scientists		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(A) differentiate between physical and chemical changes and properties	(i) differentiate between physical and chemical changes		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(A) differentiate between physical and chemical changes and properties	(ii) differentiate between physical and chemical properties		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(B) identify extensive and intensive properties	(i) identify extensive properties		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(B) identify extensive and intensive properties	(ii) identify intensive properties		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(C) compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume	(i) compare solids, liquids, and gases in terms of compressibility		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(C) compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume	(ii) compare solids, liquids, and gases in terms of structure		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(C) compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume	(iii) compare solids, liquids, and gases in terms of shape		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(C) compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume	(iv) compare solids, liquids, and gases in terms of volume		
(4) Science concepts. The student knows the characteristics of matter and can analyze the relationships between chemical and physical changes and properties. The student is expected to:	(D) classify matter as pure substances or mixtures through investigation of their properties			

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Course Title	§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).			
TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(A) explain the use of chemical and physical properties in the historical development of the Periodic Table	(i) explain the use of chemical properties in the historical development of the Periodic Table		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(A) explain the use of chemical and physical properties in the historical development of the Periodic Table	(ii) explain the use of physical properties in the historical development of the Periodic Table		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(i) use the Periodic Table to identify chemical families, including alkali metals		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(ii) use the Periodic Table to identify chemical families, including alkaline earth metals		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(iii) use the Periodic Table to identify chemical families, including halogens		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(iv) use the Periodic Table to identify chemical families, including noble gases		

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Course Title	§112.35. Chemistry, Beginning with School Year 2010-2011 (One Credit).			
TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(v) use the Periodic Table to identify chemical families, including transition metals		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(vi) use the Periodic Table to explain the properties of chemical families, including alkali metals		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(vii) use the Periodic Table to explain the properties of chemical families, including alkaline earth metals		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(viii) use the Periodic Table to explain the properties of chemical families, including halogens		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(ix) use the Periodic Table to explain the properties of chemical families, including noble gases		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(B) use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals	(x) use the Periodic Table to explain the properties of chemical families, including transition metals		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(i) use the Periodic Table to identify periodic trends, including atomic radii		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(ii) use the Periodic Table to identify periodic trends, including ionic radii		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(iii) use the Periodic Table to identify periodic trends, including electronegativity		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(iv) use the Periodic Table to identify periodic trends, including ionization energy		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(v) use the Periodic Table to explain periodic trends, including atomic radii		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(vi) use the Periodic Table to explain periodic trends, including ionic radii		
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(vii) use the Periodic Table to explain periodic trends, including electronegativity		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(5) Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:	(C) use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy	(viii) use the Periodic Table to explain periodic trends, including ionization energy		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(i) understand the experimental design used in the development of modern atomic theory, including Dalton's Postulates		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(ii) understand the conclusions used in the development of modern atomic theory, including Dalton's Postulates		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(iii) understand the experimental design used in the development of modern atomic theory, including Thomson's discovery of electron properties		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(iv) understand the conclusions used in the development of modern atomic theory, including Thomson's discovery of electron properties		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(v) understand the experimental design used in the development of modern atomic theory, including Rutherford's nuclear atom		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(vi) understand the conclusions used in the development of modern atomic theory, including Rutherford's nuclear atom		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(vii) understand the experimental design used in the development of modern atomic theory, including Bohr's nuclear atom		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(A) understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom	(viii) understand the conclusions used in the development of modern atomic theory, including Bohr's nuclear atom		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(B) understand the electromagnetic spectrum and the mathematical relationships between energy, frequency, and wavelength of light	(i) understand the electromagnetic spectrum		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(B) understand the electromagnetic spectrum and the mathematical relationships between energy, frequency, and wavelength of light	(ii) understand the mathematical relationships between energy, frequency, and wavelength of light		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(C) calculate the wavelength, frequency, and energy of light using Planck's constant and the speed of light	(i) calculate the wavelength of light using the speed of light		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(C) calculate the wavelength, frequency, and energy of light using Planck's constant and the speed of light	(ii) calculate the frequency of light using the speed of light		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(C) calculate the wavelength, frequency, and energy of light using Planck's constant and the speed of light	(iii) calculate the energy of light using Planck's constant		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(C) calculate the wavelength, frequency, and energy of light using Planck's constant and the speed of light	(iv) calculate the energy of light using Planck's constant and the speed of light		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(D) use isotopic composition to calculate average atomic mass of an element			
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(E) express the arrangement of electrons in atoms through electron configurations and Lewis valence electron dot structures	(i) express the arrangement of electrons in atoms through electron configurations		
(6) Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:	(E) express the arrangement of electrons in atoms through electron configurations and Lewis valence electron dot structures	(ii) express the arrangement of electrons in atoms through Lewis valence electron dot structures		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(A) name ionic compounds containing main group or transition metals, covalent compounds, acids, and bases, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules	(i) name ionic compounds containing main group or transition metals, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(A) name ionic compounds containing main group or transition metals, covalent compounds, acids, and bases, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules	(ii) name covalent compounds using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(A) name ionic compounds containing main group or transition metals, covalent compounds, acids, and bases, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules	(iii) name acids using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(A) name ionic compounds containing main group or transition metals, covalent compounds, acids, and bases, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules	(iv) name bases using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(B) write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases	(i) write the chemical formulas of common polyatomic ions		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(B) write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases	(ii) write the chemical formulas of common ionic compounds containing main group or transition metals		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(B) write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases	(iii) write the chemical formulas of common covalent compounds		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(B) write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases	(iv) write the chemical formulas of common acids		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(B) write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases	(v) write the chemical formulas of common bases		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(C) construct electron dot formulas to illustrate ionic and covalent bonds	(i) construct electron dot formulas to illustrate ionic bonds		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(C) construct electron dot formulas to illustrate ionic and covalent bonds	(ii) construct electron dot formulas to illustrate covalent bonds		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(D) describe the nature of metallic bonding and apply the theory to explain metallic properties such as thermal and electrical conductivity, malleability, and ductility	(i) describe the nature of metallic bonding		
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(D) describe the nature of metallic bonding and apply the theory to explain metallic properties such as thermal and electrical conductivity, malleability, and ductility	(ii) apply the theory [of metallic bonding] to explain metallic properties		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(7) Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:	(E) predict molecular structure for molecules with linear, trigonal planar, or tetrahedral electron pair geometries using Valence Shell Electron Pair Repulsion (VSEPR) theory			
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(A) define and use the concept of a mole	(i) define the concept of a mole		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(A) define and use the concept of a mole	(ii) use the concept of a mole		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(B) use the mole concept to calculate the number of atoms, ions, or molecules in a sample of material			
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(C) calculate percent composition and empirical and molecular formulas	(i) calculate percent composition		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(C) calculate percent composition and empirical and molecular formulas	(ii) calculate empirical formulas		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(C) calculate percent composition and empirical and molecular formulas	(iii) calculate molecular formulas		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(D) use the law of conservation of mass to write and balance chemical equations	(i) use the law of conservation of mass to write chemical equations		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(D) use the law of conservation of mass to write and balance chemical equations	(ii) use the law of conservation of mass to balance chemical equations		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(E) perform stoichiometric calculations, including determination of mass relationships between reactants and products, calculation of limiting reagents, and percent yield	(i) perform stoichiometric calculations, including determination of mass relationships between reactants and products		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(E) perform stoichiometric calculations, including determination of mass relationships between reactants and products, calculation of limiting reagents, and percent yield	(ii) perform stoichiometric calculations, including calculation of limiting reagents		
(8) Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:	(E) perform stoichiometric calculations, including determination of mass relationships between reactants and products, calculation of limiting reagents, and percent yield	(iii) perform stoichiometric calculations, including percent yield		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(i) describe the relations between volume [and] pressure for an ideal gas as described by Boyle's law		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(ii) describe the relations between volume [and] temperature for an ideal gas, as described by Charles' law		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(iii) describe the relations between volume [and] number of moles for an ideal gas, as described by Avogadro's law		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(iv) describe the Dalton's law of partial pressure		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(v) describe the relations between volume, pressure, number of moles, and temperature for an ideal gas, as described by the ideal gas law		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(vi) calculate volume [and] pressure for an ideal gas, as described by Boyle's law		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(vii) calculate volume [and] temperature for an ideal gas, as described by Charles' law		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(viii) calculate volume [and] number of moles for an ideal gas, as described by Avogadro's law		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(ix) calculate [total] pressure, as described by Dalton's law of partial pressure		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(A) describe and calculate the relations between volume, pressure, number of moles, and temperature for an ideal gas as described by Boyle's law, Charles' law, Avogadro's law, Dalton's law of partial pressure, and the ideal gas law	(x) calculate volume, pressure, number of moles, and temperature for an ideal gas, as described by the ideal gas law		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(B) perform stoichiometric calculations, including determination of mass and volume relationships between reactants and products for reactions involving gases	(i) perform stoichiometric calculations, including determination of mass relationships between reactants and products for reactions involving gases		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(B) perform stoichiometric calculations, including determination of mass and volume relationships between reactants and products for reactions involving gases	(ii) perform stoichiometric calculations, including determination of volume relationships between reactants and products for reactions involving gases		
(9) Science concepts. The student understands the principles of ideal gas behavior, kinetic molecular theory, and the conditions that influence the behavior of gases. The student is expected to:	(C) describe the postulates of kinetic molecular theory			
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(A) describe the unique role of water in chemical and biological systems	(i) describe the unique role of water in chemical systems		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(A) describe the unique role of water in chemical and biological systems	(ii) describe the unique role of water in biological systems		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(B) develop and use general rules regarding solubility through investigations with aqueous solutions	(i) develop general rules regarding solubility through investigations with aqueous solutions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(B) develop and use general rules regarding solubility through investigations with aqueous solutions	(ii) use general rules regarding solubility through investigations with aqueous solutions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(C) calculate the concentration of solutions in units of molarity			

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(D) use molarity to calculate the dilutions of solutions			
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(E) distinguish between types of solutions such as electrolytes and nonelectrolytes and unsaturated, saturated, and supersaturated solutions	(i) distinguish between types of solutions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(F) investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area	(i) investigate factors that influence solubilities		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(F) investigate factors that influence solubilities and rates of dissolution such as temperature, agitation, and surface area	(ii) investigate factors that influence rates of dissolution		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(G) define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid base reactions that form water	(i) define acids		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(G) define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid base reactions that form water	(ii) define bases		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(G) define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid base reactions that form water	(iii) distinguish between Arrhenius and Bronsted-Lowry definitions		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(G) define acids and bases and distinguish between Arrhenius and Bronsted-Lowry definitions and predict products in acid base reactions that form water	(iv) predict products in acid base reactions that form water		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(H) understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions	(i) understand acid-base reactions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(H) understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions	(ii) understand precipitation reactions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(H) understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions	(iii) understand oxidation-reduction reactions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(H) understand and differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions	(iv) differentiate among acid-base reactions, precipitation reactions, and oxidation-reduction reactions		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(I) define pH and use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution	(i) define pH		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(I) define pH and use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution	(ii) use the hydrogen or hydroxide ion concentrations to calculate the pH of a solution		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(J) distinguish between degrees of dissociation for strong and weak acids and bases	(i) distinguish between degrees of dissociation for strong and weak acids		
(10) Science concepts. The student understands and can apply the factors that influence the behavior of solutions. The student is expected to:	(J) distinguish between degrees of dissociation for strong and weak acids and bases	(ii) distinguish between degrees of dissociation for strong and weak bases		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(A) understand energy and its forms, including kinetic, potential, chemical, and thermal energies	(i) understand energy and its forms, including kinetic energ[y]		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(A) understand energy and its forms, including kinetic, potential, chemical, and thermal energies	(ii) understand energy and its forms, including potential energ[y]		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(A) understand energy and its forms, including kinetic, potential, chemical, and thermal energies	(iii) understand energy and its forms, including chemical energ[y]		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(A) understand energy and its forms, including kinetic, potential, chemical, and thermal energies	(iv) understand energy and its forms, including thermal energ[y]		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(B) understand the law of conservation of energy and the processes of heat transfer	(i) understand the law of conservation of energy		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(B) understand the law of conservation of energy and the processes of heat transfer	(ii) understand the processes of heat transfer		

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TEKS (Knowledge and Skills)	Student Expectation	Breakout	Element	Subelement
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(C) use thermochemical equations to calculate energy changes that occur in chemical reactions and classify reactions as exothermic or endothermic	(i) use thermochemical equations to calculate energy changes that occur in chemical reactions		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(C) use thermochemical equations to calculate energy changes that occur in chemical reactions and classify reactions as exothermic or endothermic	(ii) classify reactions as exothermic or endothermic		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(D) perform calculations involving heat, mass, temperature change, and specific heat	(i) perform calculations involving heat		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(D) perform calculations involving heat, mass, temperature change, and specific heat	(ii) perform calculations involving mass		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(D) perform calculations involving heat, mass, temperature change, and specific heat	(iii) perform calculations involving temperature change		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(D) perform calculations involving heat, mass, temperature change, and specific heat	(iv) perform calculations involving specific heat		
(11) Science concepts. The student understands the energy changes that occur in chemical reactions. The student is expected to:	(E) use calorimetry to calculate the heat of a chemical process			
(12) Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:	(A) describe the characteristics of alpha, beta, and gamma radiation	(i) describe the characteristics of alpha radiation		
(12) Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:	(A) describe the characteristics of alpha, beta, and gamma radiation	(ii) describe the characteristics of beta radiation		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(12) Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:	(A) describe the characteristics of alpha, beta, and gamma radiation	(iii) describe the characteristics gamma radiation		
(12) Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:	(B) describe radioactive decay process in terms of balanced nuclear equations			
(12) Science concepts. The student understands the basic processes of nuclear chemistry. The student is expected to:	(C) compare fission and fusion reactions			