Geometry Assessment

Eligible Texas Essential Knowledge and Skills

Texas Education Agency
Student Assessment Division
Fall 2010

STAAR Geometry Assessment

Reporting Category 1:
Geometric Structure

The student will demonstrate an understanding of geometric structure.

(G.1) **Geometric structure.** The student understands the structure of, and relationships within, an axiomatic system. The student is expected to

(B) recognize the historical development of geometric systems and know mathematics is developed for a variety of purposes; and ***Supporting Standard***

(C) compare and contrast the structures and implications of Euclidean and non-Euclidean geometries. ***Supporting Standard***

(G.2) **Geometric structure.** The student analyzes geometric relationships in order to make and verify conjectures. The student is expected to

(A) use constructions to explore attributes of geometric figures and to make conjectures about geometric relationships; and ***Supporting Standard***

(B) make conjectures about angles, lines, polygons, circles, and three-dimensional figures and determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic. ***Readiness Standard***

(G.3) **Geometric structure.** The student applies logical reasoning to justify and prove mathematical statements. The student is expected to

(A) determine the validity of a conditional statement, its converse, inverse, and contrapositive; ***Supporting Standard***

(B) construct and justify statements about geometric figures and their properties; ***Supporting Standard***

(C) use logical reasoning to prove statements are true and find counter examples to disprove statements that are false; ***Readiness Standard***

(D) use inductive reasoning to formulate a conjecture; and ***Supporting Standard***

(E) use deductive reasoning to prove a statement. ***Supporting Standard***

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Reporting Category 2:
Geometric Patterns and Representations

The student will demonstrate an understanding of geometric patterns and representations.

(G.4) **Geometric structure.** The student uses a variety of representations to describe geometric relationships and solve problems. The student is expected to

(A) select an appropriate representation ([concrete,] pictorial, graphical, verbal, or symbolic) in order to solve problems. ***Supporting Standard***

(G.5) **Geometric patterns.** The student uses a variety of representations to describe geometric relationships and solve problems. The student is expected to

(A) use numeric and geometric patterns to develop algebraic expressions representing geometric properties; ***Readiness Standard***

(B) use numeric and geometric patterns to make generalizations about geometric properties, including properties of polygons, ratios in similar figures and solids, and angle relationships in polygons and circles; ***Supporting Standard***

(C) use properties of transformations and their compositions to make connections between mathematics and the real world, such as tessellations; and ***Supporting Standard***

(D) identify and apply patterns from right triangles to solve meaningful problems, including special right triangles (45-45-90 and 30-60-90) and triangles whose sides are Pythagorean triples. ***Readiness Standard***

Reporting Category 3:
Dimensionality and the Geometry of Location

The student will demonstrate an understanding of dimensionality and the geometry of location.

(G.6) **Dimensionality and the geometry of location.** The student analyzes the relationship between three-dimensional geometric figures and related two-dimensional representations and uses these representations to solve problems. The student is expected to

(A) describe and draw the intersection of a given plane with various three-dimensional geometric figures; ***Supporting Standard***

(B) use nets to represent and construct three-dimensional geometric figures; and ***Supporting Standard***

(C) use orthographic and isometric views of three-dimensional geometric figures to represent and construct three-dimensional geometric figures and solve problems. ***Supporting Standard***

(G.7) **Dimensionality and the geometry of location.** The student understands that coordinate systems provide convenient and efficient ways of representing geometric figures and uses them accordingly. The student is expected to

(A) use one- and two-dimensional coordinate systems to represent points, lines, rays, line segments, and figures; ***Supporting Standard***

(B) use slopes and equations of lines to investigate geometric relationships, including parallel lines, perpendicular lines, and special segments of triangles and other polygons; and ***Readiness Standard***

(C) [derive and] use formulas involving length, slope, and midpoint. ***Readiness Standard***

Reporting Category 4:
Congruence and the Geometry of Size

The student will demonstrate an understanding of congruence and the geometry of size.

(G.8) **Congruence and the geometry of size.** The student uses tools to determine measurements of geometric figures and extends measurement concepts to find perimeter, area, and volume in problem situations. The student is expected to

(A) find areas of regular polygons, circles, and composite figures; ***Readiness Standard***

(B) find areas of sectors and arc lengths of circles using proportional reasoning; ***Supporting Standard***

(C) [derive,] extend, and use the Pythagorean Theorem; ***Readiness Standard***

(D) find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders, and composites of these figures in problem situations; ***Readiness Standard***

(E) use area models to connect geometry to probability and statistics; and ***Supporting Standard***

(F) use conversions between measurement systems to solve problems in real-world situations. ***Supporting Standard***

(G.9) **Congruence and the geometry of size.** The student analyzes properties and describes relationships in geometric figures. The student is expected to

(A) formulate and test conjectures about the properties of parallel and perpendicular lines based on explorations and [concrete] models; ***Supporting Standard***

(B) formulate and test conjectures about the properties and attributes of polygons and their component parts based on explorations and [concrete] models; ***Supporting Standard***

(C) formulate and test conjectures about the properties and attributes of circles and the lines that intersect them based on explorations and [concrete] models; and ***Supporting Standard***

(D) analyze the characteristics of polyhedra and other three-dimensional figures and their component parts based on explorations and [concrete] models. ***Supporting Standard***

(G.10) **Congruence and the geometry of size.** The student applies the concept of congruence to justify properties of figures and solve problems. The student is expected to

(A) use congruence transformations to make conjectures and justify properties of geometric figures including figures represented on a coordinate plane; and ***Supporting Standard***

(B) justify and apply triangle congruence relationships. ***Readiness Standard***

Reporting Category 5:
Similarity and the Geometry of Shape

The student will demonstrate an understanding of similarity and the geometry of shape.

(G.11) **Similarity and the geometry of shape.** The student applies the concepts of similarity to justify properties of figures and solve problems. The student is expected to

(A) use and extend similarity properties and transformations to explore and justify conjectures about geometric figures; ***Supporting Standard***

(B) use ratios to solve problems involving similar figures; ***Supporting Standard***

(C) develop, apply, and justify triangle similarity relationships, such as right triangle ratios, trigonometric ratios, and Pythagorean triples using a variety of methods; and ***Readiness Standard***

(D) describe the effect on perimeter, area, and volume when one or more dimensions of a figure are changed and apply this idea in solving problems. ***Readiness Standard***