



# **Geometry Assessment**

## **Eligible Texas Essential Knowledge and Skills**

# 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**

## 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**