**DOMAIN III—GEOMETRY AND MEASUREMENT**

**Competency 008**

**The teacher understands measurement as a process.**

• Selects and uses appropriate units of measurement (e.g., temperature, money, mass, weight, area, capacity, density, percents, speed, acceleration) to quantify, compare, and communicate information.

• Develops, justifies, and uses conversions within measurement systems.

• Applies dimensional analysis to derive units and formulas in a variety of situations (e.g., rates of change of one variable with respect to another) and to find and evaluate solutions to problems.

• Describes the precision of measurement and the effects of error on measurement.

• Applies the Pythagorean theorem, proportional reasoning, and right triangle trigonometry to solve measurement problems.

**Links**:

<http://mathworld.wolfram.com/PythagoreanTheorem.html>

<http://www.mathsisfun.com/accuracy-precision.html>

**Competency 009**

**The teacher understands the geometric relationships and axiomatic structure of**

**Euclidean geometry.**

• Understands concepts and properties of points, lines, planes, angles, lengths, and distances.

• Analyzes and applies the properties of parallel and perpendicular lines.

• Uses the properties of congruent triangles to explore geometric relationships and prove theorems.

• Describes and justifies geometric constructions made using a compass and straight edge and other appropriate technologies.

• Applies knowledge of the axiomatic structure of Euclidean geometry to justify and prove theorems.

• Understands the effects of transformations such as f(*x* ± *c*) on the graph of

**Links**:

<http://library.thinkquest.org/20991/geo/circles.html>

<http://www.dummies.com/how-to/content/working-with-definitions-theorems-and-postulates.html>

<http://www.docstoc.com/docs/91980349/Angle-Relationships-and-Parallel-Lines>

<http://regentsprep.org/regents/math/geometry/GG1/Euclidean.htm> Basics of Euclidean geometry.

**Competency 010**

**The teacher analyzes the properties of two- and three-dimensional figures.**

The beginning teacher:

• Uses and understands the development of formulas to find lengths, perimeters, areas, and volumes of basic geometric figures.

• Applies relationships among similar figures, scale, and proportion and analyzes how changes in scale affect area and volume measurements.

• Uses a variety of representations (e.g., numeric, verbal, graphic, symbolic) to analyze and solve problems involving two- and three-dimensional figures such as circles, triangles, polygons, cylinders, prisms, and spheres.

• Analyzes the relationship among three-dimensional figures and related two- dimensional representations (e.g., projections, cross-sections, nets) and uses these representations to solve problems.

**Links**:

<http://www.cimt.plymouth.ac.uk/projects/mepres/book9/bk9i9/bk9_9i4.html> Practice with volume and surface area

<http://www.mathwarehouse.com/geometry/polygon/> Interior and exterior angles in polygons

<http://www.ecsd-fl.schoolloop.com/Math/GeometryEOCReview> This site has links with practice problems.

**Competency 011**

**The teacher understands transformational geometry and relates algebra to geometry and trigonometry using the Cartesian coordinate system.**

• Describes and justifies geometric constructions made using a reflection device and other appropriate technologies.

• Uses translations, reflections, glide-reflections, and rotations to demonstrate congruence and to explore the symmetries of figures.

• Uses dilations (expansions and contractions) to illustrate similar figures and proportionality.

• Uses symmetry to describe tessellations and shows how they can be used to illustrate geometric concepts, properties, and relationships.

• Applies concepts and properties of slope, midpoint, parallelism, and distance in the coordinate plane to explore properties of geometric figures and solve problems.

• Applies transformations in the coordinate plane.

• Uses the unit circle in the coordinate plane to explore properties of trigonometric functions.

**Links:**

<http://www.purplemath.com/modules/triggrph.htm> Sine, Cosine and Tangent graphs

<http://www.purplemath.com/modules/distform.htm> Distance formula

<http://www.mathsisfun.com/geometry/unit-circle.html> Unit circle, special triangles

<http://www.mathsisfun.com/geometry/transformations.html> Transformations

<http://www.shodor.org/interactivate/discussions/SymmetryInTessellati/> Tessellations