# Core Content for Assessment: Measurement/Geometry

## Draft August 2005

### Measuring Physical Attributes

| End of Primary | 4th Grade | 5th Grade | 6th Grade | 7th Grade | 8th Grade | 11th Grade |
|---|---|---|---|---|---|---|
| MA-EP-2.1.1 Students will apply standard units to measure: • Weight (nearest pound); • Length (nearest half-inch or nearest centimeter); • Time (nearest quarter hour); and • Money (identify coins and bills by value). | MA-04-2.1.1 Students will apply standard units to measure: • Weight (ounce, pound; gram, kilogram); • Length (nearest quarter-inch or nearest centimeter); • Perimeter; • Area (figures that can divided into rectangular shapes); • Time (nearest five minutes); and • Temperature (Fahrenheit and Celsius). | MA-05-2.1.1 Students will apply standard units to measure: • Weight (ounce, pound; gram, kilogram); • Length (nearest eighth-of-an-inch or nearest centimeter); • Perimeter; • Area (figures that can divided into rectangular shapes); • Time (nearest minute); • Temperature (Fahrenheit and Celsius); and • Angles (nearest degree). | MA-06-2.1.1 Students will determine: • Measures of rectangles and figures that can be divided into rectangular shapes, including lengths to the nearest eighth of an inch or nearest centimeter; and • The area and perimeter of triangles and quadrilaterals (rectangles, squares). (Using the Pythagorean theorem will not be required as a strategy.) | MA-07-2.1.1 Students will determine: • Measures of both regular and irregular polygons, including length to the nearest eighth of an inch or nearest centimeter; • The area and perimeter of triangles and quadrilaterals (rectangles, squares, trapezoids) (Using the Pythagorean theorem will not be required as a strategy.); and • The area and circumference of circles. | MA-08-2.1.1 Students will determine: • Measures of both regular and irregular shapes, including lengths to the nearest sixteenth of an inch or the nearest millimeter; • The area and perimeter of triangles and quadrilaterals; and • The area and circumference of circles. | MA-H11-2.1.1 Students will determine the surface area and volume of right rectangular prisms, pyramids, cylinders, cones, and spheres in real-world problems. |
| | | MA-05-2.1.2 Students will estimate weight, length, perimeter, area, angles, and time using appropriate units of measurement. | | | MA-08-2.1.2 Students will evaluate the measures of angles by estimation and measurement with a protractor or angle ruler. | MA-H11-2.1.2 Students will describe how a change in one or more dimensions of a geometric figure affects the perimeter, area, and volume of the figure. |
| | | | | | MA-08-2.1.3 Students will apply formulas to determine the volume of right rectangular prisms in real-world problems. | MA-H11-2.1.3 Students will apply definitions and properties of right triangle relationships (right triangle trigonometry and the Pythagorean theorem) to determine length and angle measures to solve real-world problems. |
| | | | | | MA-08-2.1.4 Students will apply the Pythagorean theorem to determine the length of a hypotenuse. | |

### Systems of Measurement

| End of Primary | 4th Grade | 5th Grade | 6th Grade | 7th Grade | 8th Grade | 11th Grade |
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| | MA-04-2.2.2 Students will convert units within the U.S. customary measurement system, including money, time (seconds, minutes, hours), weight (ounces, pounds), and length (inches, feet, yards). | MA-05-2.2.2 Students will convert units within the same measurement system [U.S. customary (inches, feet, yards, miles; ounces, pounds, tons), metric (millimeters, centimeters, meters, kilometers; grams, kilograms), money, or time (seconds, minutes, hours)], and determine elapsed time. | | | MA-08-2.2.1 Students will provide examples of and apply money, time, and U.S. Customary and metric units of measurement to solve real-world problems. | |

### Geometry

| End of Primary | 4th Grade | 5th Grade | 6th Grade | 7th Grade | 8th Grade | 11th Grade |
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#### Shapes and Relationships

| End of Primary | 4th Grade | 5th Grade | 6th Grade | 7th Grade | 8th Grade | 11th Grade |
|---|---|---|---|---|---|---|
| MA-EP-3.1.1 Students will describe and provide examples of basic geometric elements and terms (sides, edges, faces, vertices, angles), and will apply these elements to solve real-world problems. | MA-04-3.1.1 Students will describe and provide examples of basic geometric elements and terms [points, segments, lines (perpendicular, parallel, intersecting), rays, angles [acute, right, obtuse], sides, edges, faces, vertices], and will apply these elements to solve real-world problems. | MA-05-3.1.1 Students will describe and provide examples of basic geometric elements and terms [points, segments, lines (perpendicular, parallel, intersecting), rays, angles (acute, right, obtuse), sides, edges, faces, vertices, radius, diameter], and will apply these elements to solve real-world problems. | MA-6-3.1.1 Students will describe and provide examples of the basic geometric elements (points, rays, lines, segments, angles [acute, right, obtuse], planes, radius, diameter, circumference). | | | MA-H11-3.1.1 Students will analyze and apply spatial relationships (not using Cartesian coordinates) among points, lines, and planes (e.g., betweenness of points, midpoint, segment length, collinear, coplanar, parallel, perpendicular, skew). |
| MA-EP-3.1.2 Students will describe and provide examples of basic two-dimensional shapes (circles, triangles, squares, rectangles, trapezoids, rhombuses, hexagons), and will apply these shapes to solve real-world problems. | MA-04-3.1.2 Students will describe and provide examples of basic two-dimensional shapes [circles, triangles (right, equilateral), squares, rectangles, trapezoids, rhombuses, pentagons, hexagons, octagons], and will apply these shapes to solve real-world problems. | MA-05-3.1.2 Students will describe and provide examples of basic two-dimensional shapes [circles, triangles (right, equilateral), all quadrilaterals, pentagons, hexagons, octagons], and will apply these shapes to solve real-world problems. | MA-06-3.1.2 Students will describe, and provide examples and properties of two-dimensional figures (circles, triangles, quadrilaterals, regular polygons), and will apply these properties and figures to solve real-world problems. | MA-07-3.1.2 Students will describe, and provide examples and properties (e.g., sides, vertices, angles, congruent parts) of two-dimensional figures (circles, triangles [acute, right, obtuse, scalene, isosceles, equilateral], quadrilaterals [square, rectangle, rhombus, parallelogram, trapezoid], regular polygons), and will apply these properties and figures to solve real-world problems. | MA-08-3.1.2 Students will identify and compare properties of two-dimensional figures (circles, triangles acute, right, obtuse, scalene, isosceles, equilateral], quadrilaterals [square, rectangle, rhombus, parallelogram, trapezoid], regular/irregular polygons), and will apply these properties and figures to solve real-world problems. | MA-H11-3.1.2 Students will analyze and apply angle relationships (e.g., linear pairs, vertical, complementary, supplementary, corresponding, and alternate interior angles) in real-world or mathematical situations. |
| MA-EP-3.1.3 Students will describe and provide examples of basic three-dimensional shapes (spheres, cones, cylinders, pyramids, cubes), and will apply these shapes to solve real-world problems. | MA-04-3.1.3 Students will describe and provide examples of basic three-dimensional shapes (spheres, cones, cylinders, pyramids, cubes, triangular and rectangular prisms), and will apply these shapes to solve real-world problems. | MA-05-3.1.3 Students will describe and provide examples of basic three-dimensional shapes (spheres, cones, cylinders, pyramids, cubes, triangular and rectangular prisms), and will apply these shapes to solve real-world problems. | | | MA-08-3.1.3 Students will compare properties of three-dimensional figures (spheres, cones, cylinders, prisms, pyramids), and will apply these properties and figures to solve real-world problems. | MA-H11-3.1.3 Students will classify and apply properties of two-dimensional geometric figures (e.g., number of sides, vertices, length of sides, sum of interior and exterior angle measures). |
| | | MA-05-3.1.4 Students will identify and describe congruent and similar figures in real-world or mathematical situations. | MA-06-3.1.4 Students will describe and provide examples of congruent and similar figures, and will apply congruent and similar figures to solve real-world problems. | MA-07-3.1.4 Students will describe and provide examples of congruent and similar figures, and will apply congruent and similar figures to solve real-world problems. | MA-08-3.1.4 Students will provide examples of congruent and similar figures, will apply congruent and similar figures to solve real-world problems, and will apply proportional reasoning to solve problems involving scale drawings and proportional figures. | MA-H11-3.1.4 Students will solve real-world problems by applying properties of triangles (e.g., Triangle Sum theorem and Isosceles Triangle theorems). |
| | | | | | | MA-H11-3.1.5 Students will classify and apply properties of three-dimensional geometric figures (e.g., number of edges, faces, vertices). |
| | | | | | | MA-H11-3.1.6 Students will apply the concepts of congruence and similarity to solve real-world problems. |

#### Transformations of Shapes

| End of Primary | 4th Grade | 5th Grade | 6th Grade | 7th Grade | 8th Grade | 11th Grade |
|---|---|---|---|---|---|---|
| MA-EP-3.2.1 Students will describe and provide examples of line symmetry in real-world situations or will apply one line of symmetry to construct a simple geometric design. | MA-04-3.2.1 Students will describe and provide examples of line symmetry in real-world situations or will apply one or two lines of symmetry to construct a simple geometric design. | MA-05-3.2.1 Students will describe and provide examples of line symmetry in real-world situations or will apply line symmetry to construct a geometric design. | | | | MA-H11-3.2.1 Students will describe properties of and apply geometric transformations within a plane to solve real-world problems. |
| | MA-04-3.2.2 Students will identify basic two-dimensional shapes in different orientations using 90º rotations (turns) around a point of rotation, reflections (flips), and translations (slides) in a plane. | MA-05-3.2.2 Students will identify or draw 90º rotations, reflections, or translations of basic shapes within a plane. | MA-06-3.2.2 Students will transform (translate and reflect across a horizontal or vertical line) figures in the first quadrant of the coordinate plane and determine new coordinates of the shape after transformation. | | MA-08-3.2.2 Students will transform (translations, reflections, and dilations with the center of dilation at the origin) figures in a coordinate plane and determine the new coordinates of the shape after the transformation. | |

#### Coordinate Geometry

| End of Primary | 4th Grade | 5th Grade | 6th Grade | 7th Grade | 8th Grade | 11th Grade |
|---|---|---|---|---|---|---|
| | MA-04-3.3.1 Students will identify and graph ordered pairs on a positive coordinate system scaled by ones or locate points on a grid. | MA-05-3.3.1 Students will identify and graph ordered pairs on a positive coordinate system scaled by ones, twos, threes, fives, or tens; locate points on a grid; and apply graphing in the coordinate system to solve real-world problems. | MA-06-3.3.1 Students will identify and graph ordered pairs on a positive coordinate system, correctly identifying the origin, axes, and ordered pairs; and will apply graphing in the coordinate system to solve real-world problems. | MA-07-3.3.1 Students will identify and graph ordered pairs on a coordinate system, correctly identifying the origin, axes, and ordered pairs; and will apply graphing in the coordinate system to solve real-world problems. | MA-08-3.3.1 Students will identify and graph ordered pairs on a coordinate system, correctly identifying the origin, axes, and ordered pairs; and will apply graphing in the coordinate system to solve real-world problems. | MA-H11-3.3.1 Students will apply algebra and graphing in the coordinate plane to analyze and solve problems (e.g., finding the final coordinates for a specified polygon, finding midpoints, finding the distance between two points, finding the slope of a segment). |