

Mathematics
Unit 4: Geometry and Measurement

Essential Understandings	<ul style="list-style-type: none"> ▪ Lines are the fundamental building blocks of polygons. ▪ Different tools are used to measure different things. ▪ Standard units provide common language for communicating measurement.
Essential Questions	<ul style="list-style-type: none"> ▪ How can one use attributes to recognize and classify polygons and three dimensional figures? ▪ How does one construct a polygon? ▪ How can one construct, describe, and compare circles? ▪ How can triangles be classified? ▪ What is rotational symmetry? ▪ How can one measure length? ▪ How can one find perimeter? ▪ What are similar figures? ▪ How can one find area using formulas? ▪ How does one convert units within the standard measurement system (i.e., meters and millimeters)? ▪ How does one use a protractor to measure angles? ▪ What is the difference between linear, square and cubic units? ▪ How does one measure volume? ▪ How can one mark the passage of time? ▪ How does one calculate elapsed time? ▪ How can one measure temperature? ▪ How does one measure capacity? ▪ How does one measure and convert weight using fractions and decimals? ▪ What is a coordinate system?

Mathematics
Unit 4: Geometry and Measurement

Essential Knowledge	<ul style="list-style-type: none"> ▪ A straight edge, compass and protractor can be used to construct a polygon. ▪ Relationships between lines can be used to identify and classify polygons. ▪ One can use attributes to determine how polygons and three-dimensional figures are alike and different. ▪ Angles are acute, obtuse, or right. ▪ All points on a circle are an equal distance from the center point. ▪ Triangles are classified as acute, obtuse or right and isosceles, equilateral or scalene. ▪ An object is symmetrical when one half is the mirror image of the other half. ▪ Slides, rotations, and reflections can be used to create patterns and demonstrate congruence. ▪ An object has rotational symmetry if an outline of the turning figure matches its original shape. ▪ Similar figures have corresponding equal angles and the lengths of the sides are proportional. ▪ Perimeter is measured in linear units. ▪ Area is measured in square units. ▪ Volume is measured in cubic units. ▪ Elapsed time is the amount of time that has passed between two given points in time. ▪ A coordinate system is used to plot and locate ordered pairs.
Vocabulary	<ul style="list-style-type: none"> ▪ <u>Terms:</u> <ul style="list-style-type: none"> ○ rectangular prism, coordinate system (Cartesian plane), ordered pair, nets, Km, miles, cubic units, formula, lateral face
Essential Skills	<ul style="list-style-type: none"> ▪ Draw and construct polygons using a straight edge, compass, and protractor. (R, A) ▪ Recognize attributes of two and three- dimensional figures using multiple methods including sides, edges, vertices and faces. Shapes include rectangular and triangular prisms, cylinders, spheres, pyramids and cones. (R, A) ▪ Identify, describe, draw, and compare circles. (R, A) ▪ Identify, describe, draw, and distinguish the following triangles: isosceles, equilateral, acute, obtuse, scalene, and right. (R, A) ▪ Slide, rotate or reflect figures to create patterns or demonstrate congruence. (R, A) ▪ Identify and create figures with rotational. (R, A) ▪ Identify numerical similarities of polygons using side proportions. (I ▪ Measure linear length using inches, feet, yards, miles, centimeters, meters and kilometers. (I, R, A) ▪ Measure the perimeter of polygons to the nearest quarter inch and

Mathematics
Unit 4: Geometry and Measurement

	half centimeter. (R, A)
--	-------------------------

Mathematics
Unit 4: Geometry and Measurement

Essential Skills	<ul style="list-style-type: none"> ▪ Measure the area of squares and rectangles to the nearest square unit. (R, A) ▪ Make conversions within measurement systems when solving problems (i.e., inches to feet, minutes to hours, grams to kilograms, ounces to cups, etc.). (I, R, A) ▪ Measure angles within 2 degrees using a protractor. (I, R) ▪ Measure and use units of measure appropriately and consistently to solve problems. (R, A) ▪ Find the area of triangles and quadrilaterals including right triangles and parallelograms. (I, R) Recognize the relationship between the area of a triangle and a quadrilateral (i.e. why the area of a triangle is $\frac{1}{2}bh$). (I, R) ▪ Explain and illustrate the difference between linear, square, and cubic units. (I, R, A) ▪ Find the volume and the surface area of rectangular prisms using a formula. (I, R, A) ▪ Use the formula $l \times w \times h$ for the volume of a rectangular prism. (I, R, A) ▪ Use formulas to compute the area and perimeter of squares and rectangles. (R, A) ▪ Recognize and estimate the relative sizes of one cubic meter, one cubic centimeter, one cubic inch and one cubic foot. (I, R, A) Create and use nets to visualize rectangular prisms and calculate the volume. (I, R) ▪ Calculate elapsed time. (R, A) ▪ Find temperature in Fahrenheit and Celsius, including negative numbers. (I, R, A) Measure capacity in milliliters, liters, ounces, cups, pints, quarts, and gallons. (R, A) ▪ Measure and convert weight in ounces, pounds, grams, and kilograms using fractions and decimals. (I, R, A) ▪ Use a coordinate system to plot and locate ordered pairs. (I, R)
-------------------------	---

Mathematics
Unit 4: Geometry and Measurement

<p>Related Maine Learning Results</p>	<p>B. Data Measurement and Approximation B1.Students understand and use measures of elapsed time, temperature, capacity, mass and use measures of mass and weight</p> <ul style="list-style-type: none">a. Select and use appropriate tools and units (mass in grams, weight in pounds) for these measures.b. Solve and justify problems with those measures. <p>C. Geometry Geometric Measurement C2.Students find the areas of triangles and quadrilaterals.</p> <ul style="list-style-type: none">a. Know how to derive and use the formula, $A = (1/2) bh$ for the area of a triangle.b. Find the area of parallelograms. <p>C3.Students understand how to find the volume and surface area of rectangular prisms.</p> <ul style="list-style-type: none">a. Know how to build solids with unit cubes and find their volume.b. Recognize and estimate the relative sizes of one cubic meter and one cubic centimeter or one cubic inch and one cubic foot.c. Know how to derive and use the formula (length x width x height) for the volume of a rectangular prism.d. Create nets to aid visualization and computation. <p>C4.Students understand how to describe position and direction in two dimensions.</p> <ul style="list-style-type: none">a. Locate points on the Cartesian plane. <p>Transformations C5.Students reflect, slide, and rotate plane figures.</p> <ul style="list-style-type: none">a. Slide, rotate, or reflect figures to create patterns or demonstrate congruence.b. Identify figures with rotational or line symmetry.c. Create figures with rotational or line symmetry.
--	--

Mathematics
Unit 4: Geometry and Measurement

<p>NECAP</p>	<p>NECAP Geometry and Measurement M (G & M) 5-3 Uses properties or attributes (shape of bases, number of lateral faces, or number of bases) to identify, compare, or describe three-dimensional shapes (rectangular prisms, triangular prisms, cylinders, spheres, pyramids, or cones). M (G & M) 5-6 Demonstrates conceptual understanding of perimeter or polygons, and the area of rectangles or right triangles through models, manipulatives, or formulas, the area of polygons or irregular figures on grids, and volume of rectangular prisms (cubes) using a variety of models, manipulatives, or formulas. Expresses all measures using appropriate units. M (G & M) 5-7 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.</p>
---------------------	--