Math: Geometry: Geometric Measurement and Relationships

<table>
<thead>
<tr>
<th>Students:</th>
<th>DesCartes Statements:</th>
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</table>
| RIT Above 260: | - Defines \( \pi \) and knows common estimates (3.14 and 22/7)  
- Determines slope from an equation (analysis)  
- Determines the slope of perpendicular lines  
- Solves problems involving complex figures (e.g., triangle, parallelogram)  
- Solves real-world problems involving surface area  
- Using the slope of an equation, identifies parallel and perpendicular lines |

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<thead>
<tr>
<th>Students:</th>
<th>RIT 251-260:</th>
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| - Calculates the height of a trapezoid, given the area, without the formula given (metric)  
- Calculates the length of one side of a cube, given the volume (customary units)  
- Calculates the radius of a sphere, given the volume and formula (metric units)  
- Classifies polygons by properties  
- Determines an endpoint of a line segment on a coordinate grid, given the midpoint and the other endpoint  
- Determines slope from an equation (analysis)  
- Determines the area of a figure when plotting ordered pairs without a grid  
- Determines the area of a parallelogram, given a labeled diagram  
- Determines the circumference when given the area of a circle (or vice versa)  
- Determines the diameter or radius when given the area of a circle (metric units)  
- Determines the midpoint of a line on a coordinate grid  
- Determines the slope of perpendicular lines  
- Determines the volume of a cylinder  
- Recognizes that the sum of the measures of two sides of a triangle must be greater than the measure of the third side  
- Solves complex problems involving inscribed figures  
- Solves problems involving complex figures (e.g., triangle, parallelogram)  
- Solves real-world problems comparing volumes of figures  
- Solves real-world problems involving surface area  
- Using the slope of an equation, identifies parallel and perpendicular lines |

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<thead>
<tr>
<th>Students:</th>
<th>RIT 241-250:</th>
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| - Calculates the area of irregular shapes (metric units)  
- Computes and interprets the midpoint, given a set of ordered pairs (horizontal and vertical lines)  
- Describes the change in area of a rectangle when dimensions of an object are altered  
- Determines slope from an equation (analysis)  
- Determines the area of a figure when plotting ordered pairs without a grid  
- Determines the area of a parallelogram, given a labeled diagram  
- Determines the area of a triangle without the formula  
- Determines the area of irregular shapes (customary units)  
- Determines the circumference when given the area of a circle (or vice versa)  
- Determines the circumference when given the diameter or radius (or vice versa)  
- Determines the diameter or radius when given the area of a circle (metric units)  
- Determines the effects of changing dimensions on volume (no units)  
- Determines the figure when plotting ordered pairs  
- Determines the midpoint of a line on a coordinate grid  
- Determines the surface area of rectangular solids  
- Identifies and determines missing angle measures for complementary angles  
- Recognizes that the sum of the measures of two sides of a triangle must be greater than the measure of the third side  
- Solves complex problems involving inscribed figures  
- Solves problems comparing areas of different polygons  
- Solves problems involving area of a circle  
- Solves problems involving area of a rectangle and converts to larger or smaller units (customary) |

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<thead>
<tr>
<th>Students:</th>
<th>RIT 231-240:</th>
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| - Calculates the area of a rectangle, given labeled sides (customary units)  
- Calculates the base or height of a parallelogram, given the area and formula (metric)  
- Calculates the length, width, or height of a rectangular prism, given the area (customary units)  
- Calculates the volume of a rectangular prism, and converts to a different measurement scale (customary units) |
• Calculates the volume of rectangular solids
• Classifies isosceles triangles
• Classifies scalene triangles
• Compares area of numerous triangles
• Compares polygons by properties
• Describes the change in area of a rectangle when dimensions of an object are altered
• Describes the change in perimeter when dimensions of an object are altered
• Determines an appropriate scale for representing an object in a scale drawing
• Determines the area of a parallelogram, given a labeled diagram
• Determines the area of a trapezoid, given the formula (metric units)
• Determines the area of a triangle drawn on a grid
• Determines the area of a triangle, given the formula
• Determines the area of irregular shapes (customary units)
• Determines the circumference when given the area of a circle (or vice versa)
• Determines the circumference when given the diameter or radius (or vice versa)
• Determines the length or width of a rectangle, given the area (metric units)
• Determines which lines are perpendicular (analysis)
• Explores maps and relates them to measurements of real distances, using proportional reasoning
• Identifies properties of circles
• Identifies properties of quadrilaterals
• Identifies the formula for perimeter with a variable
• Knows the relationship between radius, diameter, and circumference
• Measures length to the nearest millimeter
• Solves problems comparing areas of different polygons
• Solves problems involving the perimeter of irregular or complex shapes
• Solves simple problems involving the area of a square or rectangle
• Understands the procedure for finding the area and surface area of figures
• Uses similarity to solve problems using scale drawings

Students:

RIT 221-230:
• Calculates area and perimeter of a rectangle (customary units)
• Calculates the area of a rectangle, given labeled sides (customary units)
• Calculates the base or height of a parallelogram, given the area and formula (metric)
• Calculates the volume of a rectangular prism, and converts to a different measurement scale (customary units)
• Calculates the volume of rectangular solids
• Classifies equilateral triangles
• Classifies polygons by type of angle
• Compares polygons by properties
• Describes the change in area of a triangle when 1 dimension of an object is altered (metric units)
• Describes the change in perimeter when dimensions of an object are altered
• Determines an appropriate scale for representing an object in a scale drawing
• Determines coordinates of geometric figures in the first quadrant
• Determines the area of irregular shapes (customary units)
• Determines the length or width of a rectangle, given the area (metric units)
• Determines the perimeter of a figure using non-standard units
• Determines which lines are perpendicular (analysis)
• Identifies acute angles
• Identifies and determines missing angle measures for supplementary angles
• Identifies and names a quadrilateral
• Identifies and names a rhombus
• Identifies properties of quadrilaterals
• Identifies rays
• Identifies the number of edges on rectangular prisms
• Measures length to the nearest millimeter
• Solves problems involving the perimeter of irregular or complex shapes
• Solves problems involving the perimeter of squares, rectangles, or triangles
• Solves simple problems involving the area of a square or rectangle
• Uses similarity to solve problems using scale drawings
### Students: RIT 211-220:
- Calculates the volume of a rectangular prism, and converts to a different measurement scale (customary units)
- Classifies polygons by type of angle
- Describes the change in area of a triangle when 1 dimension of an object is altered (metric units)
- Describes the change in perimeter when dimensions of an object are altered
- Determines an appropriate scale for representing a distance on a map
- Determines the area of irregular shapes with partial square units
- Determines the diameter, given the radius, and vice versa
- Determines the perimeter of a figure using non-standard units
- Estimates and finds volume of a figure using cubic units
- Estimates the measure of acute, right, and obtuse angles using 45 and 90 degrees as referents
- Finds the perimeter of a polygon using a formula
- Identifies acute angles
- Identifies and names a quadrilateral
- Identifies and names a rhombus
- Identifies and names a trapezoid
- Identifies corners (vertices) of cubes
- Identifies obtuse angles
- Identifies properties of angles
- Identifies rays
- Identifies the net which makes a cube-like (open box) figure
- Identifies the number of edges on rectangular prisms
- Knows the approximate size of a millimeter
- Measures angles using a protractor
- Predicts and verifies the effects of combining or subdividing basic shapes
- Selects and uses the appropriate type and size of unit in metric system (mass)
- Solves problems involving the perimeter of squares, rectangles, or triangles
- Solves simple problems involving capacity
- Uses the appropriate unit of measure for length

### Students: RIT 201-210:
- Classifies cubes by their properties (e.g., edges with equal lengths, faces with equal areas and congruent shapes, right angle corners)
- Classifies polygons by number of sides
- Classifies polygons by sides and angles
- Describes the change in area of a triangle when 1 dimension of an object is altered (metric units)
- Determines the area of irregular shapes with partial square units
- Determines the perimeter of a figure where some sides are labeled
- Estimates and finds volume of a figure using cubic units
- Estimates the area of rectangles using square units
- Estimates the measure of acute, right, and obtuse angles using 45 and 90 degrees as referents
- Identifies a cube from a net
- Identifies and names a cylinder
- Identifies and names a hexagon
- Identifies and names a parallelogram
- Identifies and names a trapezoid
- Identifies corners (vertices) of cubes
- Identifies parallel lines
- Identifies situations where it is appropriate to calculate area
- Knows the approximate size of a gram
- Knows the approximate size of a pound
- Knows the approximate size of a yard
- Measures length to the nearest centimeter
- Uses basic indirect methods to estimate measurements (grids for area of irregular figures)
- Uses models to compare angles relative to right angles
- Uses the appropriate unit of measure for length

### Students: RIT 191-200:
- Creates a new shape by combining different shapes, or identifies the different shapes that were used to make the original shape
- Determines the perimeter of a figure where all sides are labeled
- Determines the perimeter of a figure where some sides are labeled
- Estimates the area of rectangles using square units
- Explores maps and relates them to measurements of real distances, using the scale
- Identifies and names a cylinder
- Identifies and names a sphere
- Identifies corners (vertices) of cubes
- Identifies lines
- Identifies parallel lines
- Identifies right angles
- Identifies the number of faces on rectangular prisms
- Selects and uses the appropriate type and size of unit in customary system (length)
- Solves simple problems involving the perimeter of squares, rectangles, or triangles
- Sorts 2-D shapes and objects according to their attributes
- Uses models to compare angles relative to right angles

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<td>- Classifies polygons by sides and vertices</td>
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<td>- Determines more capacity or less capacity</td>
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<td>- Determines the area of irregular shapes by counting square units</td>
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<td>- Determines the perimeter of a figure where all sides are labeled</td>
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<td></td>
<td>- Identifies and names a cube</td>
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<td>- Identifies and names a sphere</td>
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<td>- Measures length with customary measures to the half-inch mark</td>
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<td>- Selects and uses the appropriate type and size of unit in customary system (length)</td>
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<td>- Uses a variety of non-standard units to measure the same length</td>
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<tr>
<td></td>
<td>- Determines the area of irregular shapes by counting square units</td>
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<td>- Estimates and measures length of an object to the nearest centimeter using a picture of a ruler</td>
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<tr>
<td></td>
<td>- Identifies and names a cube</td>
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<td>- Identifies and names a square</td>
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<td>- Identifies and names a triangle</td>
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<td>- Measures length with customary measures to the inch mark</td>
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<td>- Recognizes geometric shapes in real-world objects</td>
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<td>- Compares objects (shorter, longer)</td>
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<td>- Compares open and closed figures</td>
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<td>- Estimates and measures length of an object to the nearest inch using a picture of a ruler</td>
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<td>- Identifies and names a cone</td>
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<td></td>
<td>- Identifies and names a rectangle</td>
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<tr>
<td></td>
<td>- Identifies and names a square</td>
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<tr>
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<td>- Identifies and names a triangle</td>
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<tr>
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<td>- Identifies position of shapes (e.g., inside, outside, between)</td>
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<td>- Identifies sides and vertices of polygons</td>
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<td>- Measures length with customary measures to the inch mark</td>
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<td>- Measures length with metric measures to the centimeter mark</td>
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<td>- Sorts solid figures and objects according to attributes</td>
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<tr>
<th>Students:</th>
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<td>- Identifies and names a circle</td>
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<td></td>
<td>- Identifies spatial sense concepts (e.g., outside, inside, between, over, under, above, below, behind, in front, middle)</td>
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