# Mathletics NWEA Common Core Geometry 

## Skill Quests



RIT Score Band
May, 2022

# NWEA Common Core 

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Skill Quests
May 2022
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## RIT Score Band 189-200

## 1 Reason with shapes and their attributes

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.G.A.1 Understand that shapes in <br> different categories (e.g., <br> rhombuses, rectangles, and others) <br> may share attributes (e.g., having <br> four sides), and that the shared <br> attributes can define a larger <br> category (e.g., quadrilaterals). <br> Recognize rhombuses, rectangles, <br> and squares as examples of <br> quadrilaterals, and draw examples <br> of quadrilaterals that do not belong <br> to any of these subcategories. | Understanding shapes <br> and their attributes | Sorting and naming <br> quadrilaterals |
| Comparing and describing <br> two-dimensional shapes |  |  |
| 3.G.A.2 Partition shapes into parts <br> with equal areas. Express the area <br> of each part as a unit fraction of the <br> whole. | Partitioning shapes | Partition shapes into parts <br> with equal areas |

## RIT Score Band 201-210

## 1 Draw and identify lines and angles, and classify shapes by properties of their lines and angles

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.G.A.1 Draw points, lines, line <br> segments, rays, angles (right, acute, <br> obtuse), and perpendicular and <br> parallel lines. Identify these in two- <br> dimensional figures. | Spatial features in 2D <br> figures | Classifying angles |
| 4.G.A.2 Classify two-dimensional <br> figures based on the presence or <br> absence of parallel or perpendicular points and lines <br> lines, or the presence or absence of <br> angles of a specified size. | Classifying 2D figures | Identifying spatial features in <br> 2D shapes |
| Recognize right triangles as a <br> category, and identify right <br> their spatial features |  | Classifying triangles by their <br> sides and angles |
| 4.G.A.3 Recognize a line of <br> symmetry for a two-dimensional <br> figure as a line across the figure <br> such that the figure can be folded <br> along the line into matching parts. <br> Identify line-symmetric figures and <br> draw lines of symmetry. | Lines of symmetry | Lines of symmetry |

## RIT Score Band 211-217

## 1 Graph points on the coordinate plane to solve real-world and mathematical problems

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 5.G.A. 1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and $x$-coordinate, $y$-axis and $y$ coordinate). | Introducing the coordinate plane | Introducing in the coordinate plane |
| 5.G.A. 2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. | Graphing in the first quadrant | Graphing in the first quadrant |

## 2 Classify two-dimensional figures into categories based on their properties

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.G.B.3 Understand that attributes <br> belonging to a category of two- <br> dimensional figures also belong to <br> all subcategories of that category. | Attributes of 2D figures | Sorting plane shapes |
| 5.G.B.4 Classify two-dimensional <br> figures in a hierarchy based on <br> properties. | Classifying 2D figures, <br> properties | Classifying 2D figures in a <br> hierarchy |

## RIT Score Band 218-221

## 1 Solve real-world and mathematical problems involving area, surface area, and volume

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 6.G.A. 1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. | Area: triangles and quadrilaterals | Finding the area of a right triangle, no formula |
|  |  | Finding the area of a triangle |
|  |  | Investigating the area of special quadrilaterals |
|  |  | Real-world area problems: special quadrilaterals |
| 6.G.A. 2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $\mathrm{V}=\mathrm{I} \mathrm{wh}$ and $\mathrm{V}=\mathrm{bh}$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. | Volume: rectangular prisms, formula | Volume: rectangular prisms, fraction edge lengths |
| 6.G.A. 3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. | Polygons in the coordinate plane | Drawing polygons in the coordinate plane |
| 6.G.A. 4 Represent threedimensional figures using nets | Surface area | Connecting 3D objects with their nets |
| made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. |  | Calculating the surface area of rectangular prisms |

## RIT Score Band 222-226

## 1 Draw construct, and describe geometrical figures and describe the relationships between them

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 7.G.A. 1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. | Scale drawings | Scale drawings |
| 7.G.A. 2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | Constructing triangles | Triangle Inequality Theorem Constructing triangles with given conditions |
| 7.G.A. 3 Describe the twodimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. | Cross sections of 3D figures | Describing cross sections of 3D figures |

## 2 Solve real-life and mathematical problems involving angle measure, area, surface area, and volume

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 7.G.B.4 Know the formulas for the <br> area and circumference of a circle <br> and use them to solve problems; <br> give an informal derivation of the <br> relationship between the <br> circumference and area of a circle. | Circles: area and <br> circumference | Finding the area of a circle <br> circle |
| 7.G.B.5 Use facts about <br> supplementary, complementary, <br> vertical, and adjacent angles in a <br> multi-step problem to write and <br> solve simple equations for an <br> unknown angle in a figure. | Using angle facts to <br> solve problems |  |


| 7.G.B.6 Solve real-world and | Area, volume and | Area: polygons |
| :--- | :--- | :--- |
| mathematical problems involving |  |  |
| surface area | Volume: right prisms |  |
| area, volume and surface area of |  |  |
| two- and three-dimensional objects |  | Surface area: rectangular and <br> composed of triangles, |
| quadrialar prisms <br> quadraterals, polygons, cubes, and <br> right prisms. |  |  |

## RIT Score Band 227-228

1 Understand congruence and similarity using physical models, transparencies, or geometry software

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 8.G.A.1 Verify experimentally the <br> properties of rotations, reflections, <br> and translations. | Introducing rigid <br> transformations | Translating points on the <br> coordinate plane |
|  |  | Reflecting points across the x- <br> or y-axis |
|  | Rotating points about the <br> origin |  |
| 8.G.A.1.A Lines are taken to lines, <br> and line segments to line segments <br> of the same length. | Preserved properties: <br> length | Preserved properties: length |
| 8.G.A.1.B Angles are taken to <br> angles of the same measure. | Preserved properties: <br> angles | Preserved properties: angles |
| 8.G.A.1.C Parallel lines are taken to <br> parallel lines. | Preserved properties: <br> parallel lines | Preserved properties: parallel <br> lines |
| 8.G.A.2 Understand that a two- <br> dimensional figure is congruent to <br> another if the second can be <br> obtained from the first by a <br> sequence of rotations, reflections, <br> and translations; given two <br> congruent figures, describe a <br> sequence that exhibits the <br> congruence between them. | Congruency: rigid <br> transformations | Congruency: rigid <br> transformations |
| 8.G.A.3 Describe the effect of <br> dilations, translations, rotations, <br> and reflections on two-dimensional <br> figures using coordinates. | Transformations, <br> coordinates |  |
| 8.G.A.4 Understand that a two- <br> dimensional figure is similar to <br> another if the second can be <br> obtained from the first by a <br> sequence of rotations, reflections, <br> translations, and dilations; given <br> two similar two-dimensional <br> figures, describe a sequence that <br> exhibits the similarity between <br> them. | Similarity: <br> transformations |  |
| 8.G.A.5 Use informal arguments to <br> establish facts about the angle sum <br> and exterior angle of triangles, <br> about the angles created when | Triangles and angle <br> relationships |  |


| parallel lines are cut by a <br> transversal, and the angle-angle <br> criterion for similarity of triangles. |  | Using scale to analyze similar <br> triangles |
| :--- | :--- | :--- |
|  |  | Identifying similar triangles |

## 2 Understand and apply the Pythagorean Theorem

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 8.G.B. 6 Explain a proof of the Pythagorean Theorem and its converse. | The Pythagorean Theorem and its converse | Identifying the hypotenuse, right triangles |
|  |  | Identifying right triangles, Pythagorean Theorem |
|  |  | Pythagorean triples |
| 8.G.B. 7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. | Applying the Pythagorean Theorem | Pythagorean Theorem: missing short side |
|  |  | Pythagorean Theorem: missing hypotenuse |
|  |  | Pythagorean Theorem: missing side |
|  |  | Pythagorean Theorem in 2D and 3D |
| 8.G.B. 8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. | Distance between two points | Finding the distance between two points |

## 3 Solve real-world and mathematical problems involving volume of cylinders,

 cones, and spheres| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 8.G.C. 9 Know the formulas for the <br> volumes of cones, cylinders, and <br> spheres and use them to solve real- <br> sporld and mathematical problems. | Volume: cones, <br> cylinders and spheres |  | | Volume: cones |
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