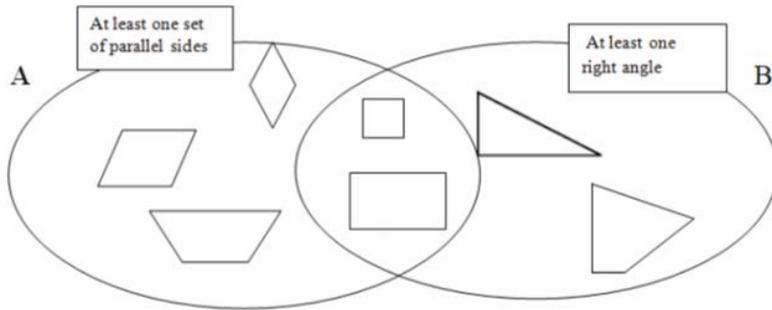| Draw and identify lines and angles, as well as classify shapes by properties of their lines and angles (Standards 4.G.1–3). |
|---|

**Standard 4.G.1** Draw points, lines, line segments, rays, angles (right, acute, and obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

## Concepts and Skills to Master

- Draw points, lines, line segments, rays, angles (right, acute, and obtuse), perpendicular and parallel lines
- Identify points, lines, line segments, rays, angles (right, acute, and obtuse), perpendicular and parallel lines in two-dimensional figures

Teacher Note: In third grade students informally recognize attributes of quadrilaterals, including parallel lines and right angles. Although students need to develop explicit awareness of and vocabulary for many concepts they have been developing, including points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines, it is  more important that they construct examples of these concepts. For example, drawing angles and triangles that are acute, obtuse, and right, will help students form a richer conceptual understanding of how these images are connected to their verbal definitions. (http://commoncoretools.me/wp-content/uploads/2014/12/ccss_progression_gk6_2014_12_27.pdf)

| Related Standards: Current Grade Level | Related Standards: Future Grade Levels |
|---|---|
| **4.G.2**  Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size.  Recognize right triangles as a category, and identify right triangles<br>**4.MD.5** Recognize angles as geometric figures that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement | **5.G.3**  Understand that attributes belonging to a category of two-dimensional figures all belong to all subcategories of that category<br>**5.G.4**  Classify two-dimensional figures in a hierarchy based on properties |

## Critical Background Knowledge from Previous Grade Levels

- Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories (3.G.1)
- Recognize and draw shapes having specified attributes, such as a given number of sides of angles. Identify and describe quadrilaterals, squares, rectangles, and trapezoids (2.G.1)
- Identify and distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes (1.G.1)
- Students work with trapezoids, squares, rectangles, triangles, circles, and hexagons in first and second grade. The term *quadrilateral* is introduced in second grade. Rhombuses and parallelograms are introduced in third grade.

## Academic Vocabulary

point, line, line segment, ray, angle ($\angle$ ), obtuse, acute, right, parallel ($\parallel$), perpendicular ($\perp$) , two-dimensional, figure, attribute, angle, closed figure, faces, polygon, rhombus, rectangle, side, square, parallel, parallelogram, quadrilateral, trapezoid, vertex, right angle ($\llcorner$ )

Teacher Note:  Rectilinear figures must have four right angles. Ensure that correct plural forms of vocabulary words are used. The plural form for rhombus may be rhombuses or rhombi (may be used interchangeably). The plural form for vertex is vertices.

| Suggested Models | Suggested Strategies |
|---|---|
| right angle ⌐<br><br>acute angle ∠<br><br>obtuse angle ⦦<br><br>straight angle ⟷<br><br>segment •—•<br><br>line ⟷<br><br>ray •—→<br><br>parallel lines ↕↕<br><br>perpendicular lines ⟷<br><br>How many acute, obtuse, and right angles are in this shape? | • Draw points, lines, line segments, rays, angles, perpendicular and parallel lines<br>• Use highlighters to find points, lines, line segments, rays, angles, perpendicular and parallel lines in 2-dimensional shapes<br>• Draw and list the properties of a given shape. Draw and list the properties of another shape. How are your drawings and lists alike? How are they different? Be ready to share your thinking with the class.<br>• Draw uppercase the letters of the alphabet to identify points, lines, line segments, rays, angles, perpendicular and parallel lines |

Image Source: http://www.dpi.state.nc.us/docs/curriculum/mathematics/scos/4.pdf

| Draw and identify lines and angles, as well as classify shapes by properties of their lines and angles (Standards 4.G.1–3) |
|---|

**Standard 4.G.2** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

## Concepts and Skills to Master

- Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines
- Classify two-dimensional figures based on the presence or absence of angles of a specified size
- Identify right triangles (any triangle with an angle measuring 90 degrees).
- Use side length to classify triangles as equilateral, equiangular, isosceles, or scalene
- Use angle size to classify them as acute, right, or obtuse

Teacher Note: Students may be exposed to the terms equilateral, isosceles, and scalene to describe triangles.

| Related Standards: Current Grade Level | Related Standards: Future Grade Levels |
|---|---|
| **4.G.1** Understand that shapes in different categories may share attributes , and that the shared attributes can define a larger category<br>**4.MD.5** Recognize angles as geometric figures that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement<br>**4.MD.6** Measure angles in whole-number degrees using a protractor | **5.G.3** Understand that attributes belonging to a category of two-dimensional figures all belong to all subcategories of that category.<br>**5.G.4** Classify two-dimensional figures in a hierarchy based on properties.<br>**G.6.1** Students need to identify right triangles |

## Critical Background Knowledge from Previous Grade Levels

- Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. (3.G.1)
- Recognize and draw shapes having specified attributes, such as a given number of sides of angles. Identify and describe quadrilaterals, squares, rectangles, and trapezoids (2.G.1)
- Identify and distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes (1.G.1)
- Students work with trapezoids, squares, rectangles, triangles, circles, and hexagons in first and second grade. The term *quadrilateral* is introduced in second grade. Rhombuses and parallelograms are introduced in third grade.

## Academic Vocabulary

classify, right triangle, parallel line, perpendicular line, acute angle, obtuse angle, right angle, two-dimensional figure
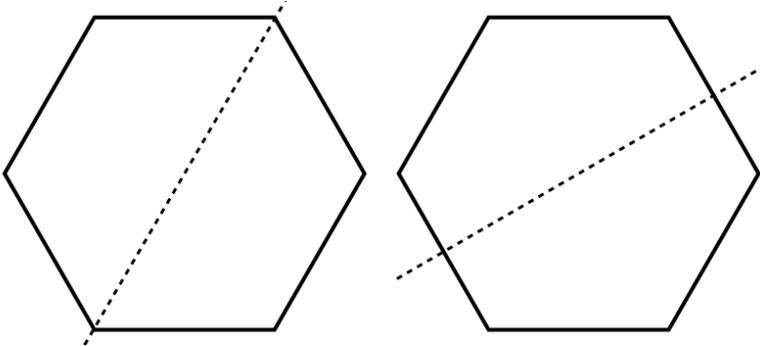
| Suggested Models | Suggested Strategies |
|---|---|
|  | - Use graphic organizers such as Venn diagrams, t-charts, etc.<br>- Play "Guess My Rule". Select a rule (for example quadrilaterals) start to sort a given set of shapes. Slowly add shapes to the sort. After each shape is added students guess the rule.<br>- Sort for examples and non-examples of a given attribute |

| | Closed shape | 4 sides | Opposite sides parallel | Perpendicular line segments | Opposite sides congruent | All sides congruent | Right angle(s) | Acute angle(s) | Obtuse angle(s) |
|---|---|---|---|---|---|---|---|---|---|
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4.G.2

| Draw and identify lines and angles, as well as classify shapes by properties of their lines and angles (Standards 4.G.1–3). |
|---|

**Standard 4.G.3** Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

**Concepts and Skills to Master**

- Recognize the meaning of a line of symmetry as a line that separates two matching parts in a figure
- Draw lines of symmetry within a figure
- Identify whether or not a figure has a line of symmetry

Teacher Note: Fourth grade work is limited to line symmetry. Rotational symmetry, also referred to as point symmetry, is introduced in eighth grade.

| Related Standards: Current Grade Level | Related Standards: Future Grade Levels |
|---|---|
| There are no directly related standards in this grade level, although recognizing symmetry may related to drawing and classifying shapes (4.G.1. 4.G.2) | **8.G.2** Understand congruence by a sequence of rotations, reflection, and translations |

**Critical Background Knowledge from Previous Grade Levels**

- Partition shapes into halves (2.G.3, 1.G.3)
- Compose two-dimensional shapes (1.G.2)

**Academic Vocabulary**

symmetry, matching parts, line, line of symmetry, symmetrical

| Suggested Models | Suggested Strategies |
|---|---|
| | <ul><li>Use tracing paper to trace a shape and fold along the line of symmetry to recognize the matching parts</li><li>Sort shapes into "shapes with a line of symmetry" and "shapes those without a line a symmetry"</li><li>Use a geometry mirror to explore whether or not a shape has a line of symmetry</li><li>Use geoboards or dot grids to explore shapes and identify whether or not a line of symmetry exists</li><li>Find all of the lines of symmetry in a given shape</li></ul> |