Unit 8 Family Support Materials

Properties of Two-dimensional Shapes

In this unit, students classify triangles and quadrilaterals, based on the attributes of their sides and angles. They also learn about lines of symmetry in two-dimensional figures. Students then use these attributes of figures to solve geometric problems, including those about perimeter and area.

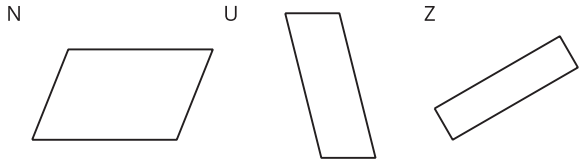
Section A: Side Lengths, Angles, and Lines of Symmetry

In this section, students think about different attributes of two-dimensional shapes, such as:

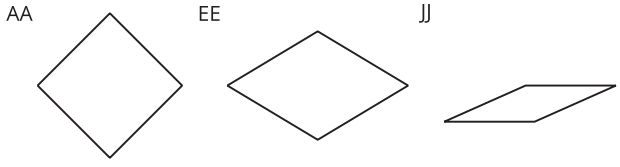
- number of sides
- lengths of sides
- sizes of angles
- presence of parallel or perpendicular lines
- symmetry

They examine shapes, classify them by the attributes they share, and explain their classifications. Students think about what must be true about the sides and the angles of each type of quadrilateral. For example, they identify quadrilaterals as parallelograms if they have two pairs of parallel sides, as rhombuses if they have four equal sides, and so on.

Quadrilaterals N, U, and Z are parallelograms.

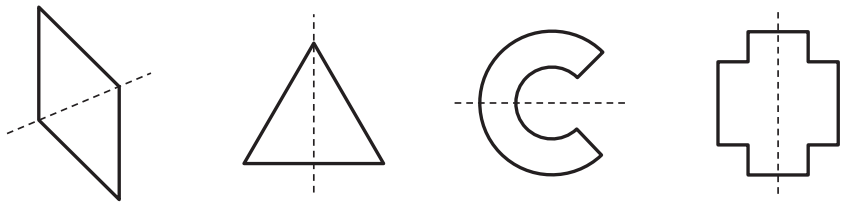


Quadrilaterals AA, EE, and JJ are rhombuses.



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Students also learn about symmetry—whether a figure can be folded along a line into two equal halves that match up exactly. They draw lines of symmetry for given figures, and complete drawings of figures that are halved by a line of symmetry.

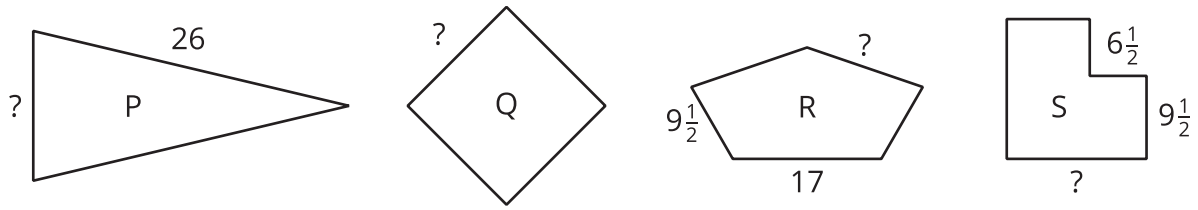


Section B: Reason about Properties to Solve Problems

In this section, students reason about measurements in shapes.

Students begin by finding the perimeters of shapes for which all side lengths are given. Then they look at shapes for which all side lengths are not given but can be found because of the attributes of the shapes (for example, the opposite sides are the same length) or because the perimeter is known.

Figures P, R, and S each have 1 line of symmetry.
Figure Q has 4 lines of symmetry. All figures have a perimeter of 64 inches.

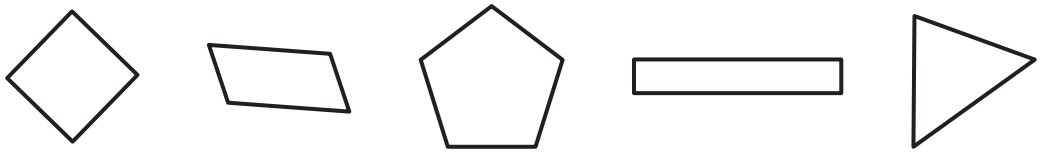


As they find perimeters and side lengths, students also practice performing operations on whole numbers and fractions.

Try it at home!

Near the end of the unit, ask your fourth grader to solve the following problems:

- What attribute do these figures have in common?
- For each figure, how many lines of symmetry can you find?



- What shapes do you see around the home or in places we visit? How could we classify them into categories?

Questions that may be helpful as they work:

- Can you describe the attributes of these shapes?
- What does it mean to have a line of symmetry?

Solution:

Answers may vary.

Sample responses:

- Each figure has at least 2 sides that are the same length. Each figure has at least 2 angles that are the same size.
- The first figure has 4 lines of symmetry. The second figure has no lines of symmetry. The third and fifth figures appear to have 1 line of symmetry each. The fourth figure has two lines of symmetry.
- I see squares, rectangles, triangles, and circles. I can categorize them into quadrilaterals, parallelograms, by the size of their angles, and by whether or not they have a line of symmetry.
- The rectangle has 4 right angles and 2 pairs of parallel sides. The triangle has 2 acute angles. The first shape appears to have 4 equal sides. The second shape has 5 obtuse angles.
- A line of symmetry is a line that divides a figure into 2 halves that match up exactly when the figure is folded along the line.