InsightMath California

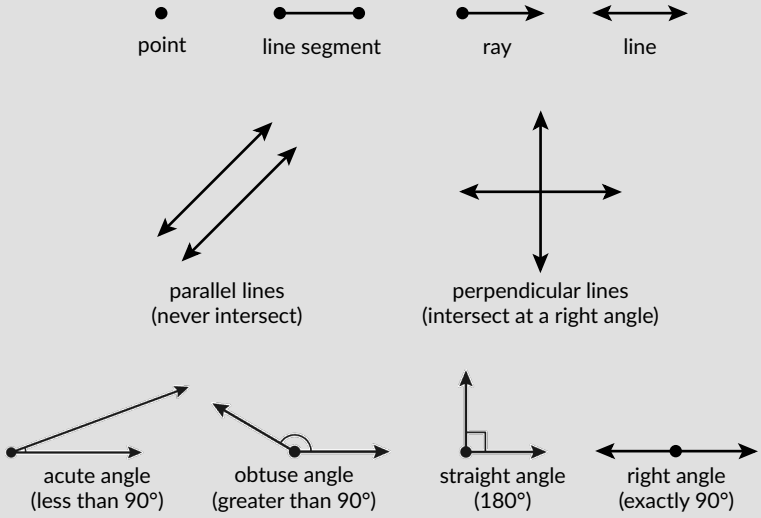
Exploring Shapes, Lines and Angles

Family Guide | Grade 4 | Unit 9

Your student is exploring how properties of two-dimensional shapes are determined by the parts that make up the shape and the relationships between those parts

Key Math Ideas

Your student entered grade 4 able to identify and describe two-dimensional shapes. In this unit, they expand their understanding of geometric figures by analyzing how fundamental elements (points, lines, rays, and angles) combine to form more complex shapes. They explore a deeper understanding of the attributes of 2-D shapes and how they can be classified, and their understanding of measurement grows as they use protractors to measure angles. In exploring these "building blocks" of shapes shown in the visuals to the right, students further their ability to use specific attributes to describe and identify 2-D shapes, which helps them recognize similarities and differences between 2-D shapes.

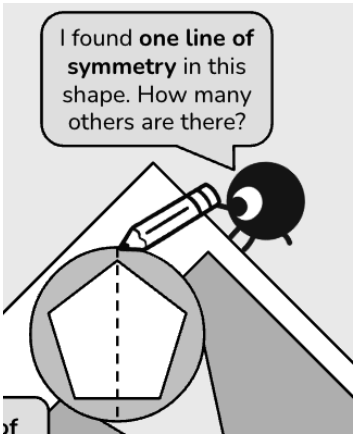


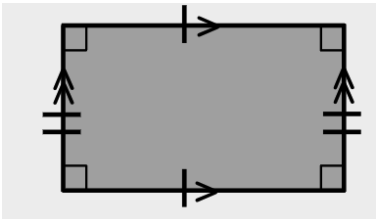
→ In the first half of the unit, your student will learn to

- dentify and describe points, lines, rays, line segments, parallel lines, and intersecting lines;
- identify and describe right, acute, obtuse, and straight angles;
- describe that an angle can be measured in degrees and that a full turn of a circle is 360°;
- measure and draw angles with a protractor and other tools;
- solve addition and subtraction problems involving angles.

→ In the second half of the unit, your student will learn to

- identify and classify triangles and quadrilaterals based on their properties such as angles, side lengths, or parallel sides;
- recognize and use symbols for parallel, perpendicular, and congruent sides of a polygon;
- identify and draw lines of symmetry for two-dimensional shapes.





This rectangle has symbols showing congruent (identical in length) sides, parallel sides (which will never intersect) and perpendicular sides (with a right angle).

Helpful Hint

Are straight lines an angle? It is common to think not, but they are! A straight line shows a 180° angle. We can also think of it as half of a circle since a full rotation of a circle is 360°. Sometimes students expect angles to look a certain way, such as acute, obtuse, or right angles. But straight lines have an angle, too, and recognizing this is helpful for solving problems, both in math class and in the real world!

Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ In the first half of the unit:

- How can you describe lines, rays, and line segments?
- How can you describe sizes of angles?
- How do you measure angles?
- How can angle measures be used to solve problems??

→ In the second half of the unit:

- Can a triangle be sorted more than one way? Why or why not?
- What attributes can you use to identify quadrilaterals?
- How can you compare and contrast quadrilaterals?
- What patterns do you see for lines of symmetry in shapes??

If...	Try...
your student has difficulty identifying a shape and its attributes . . .	asking them what they notice about the shape. Support them by asking questions like: "How many sides does the shape have?" "What do you notice about the angles?" and "Does the shape have parallel or perpendicular sides?"

Student Strengths Spotlight

I justify my thinking.	Students are explain their reasoning behind their choices, decisions, or problem-solving process, providing evidence or logic to support their perspective.
I determine what tools and strategies might help me solve this problem.	Students choose to use their preferred strategies and methods to solve problems.
I consider how precise I need to be when solving problems.	Students understand that the level of accuracy required in their answer (rounding, using exact values, etc.) should be determined by the specific context of the problem.

Try This Together!

- **Play a "Guess the Shape" Game.** Help your students draw some common shapes on a sticky note or index card, such as a trapezoid, equilateral triangle (three equal side lengths), or a square, and label the name of the shape. Have your student choose a shape card and give you clues about the attributes of the shape. For example, if they have an isosceles triangle they might say it has three sides, two of the sides are equal, and all acute angles. See if you can figure out the shape! Switch turns and give clues to your student so they can figure out the next shape based on its attributes.
- **How Many Angles?** Take a look around your home or neighborhood and see how many angles you can find. Have your student identify if the angle is acute, obtuse, right, or a straight angle. If you have a protractor, you can even have your student measure the angle!
- **Be a Photographer!** Give your student the role of photographer on your next family outing to a park, museum, zoo, or even on a walk. See if they can find interesting shapes to photograph. Take a look at the photos together and ask them what shapes they see. Encourage them to tell you the attributes that help them recognize the shapes. Ask questions like: "Does it have parallel or perpendicular lines?" or "What do you notice about the angles?"