

4B.15.1 Angles

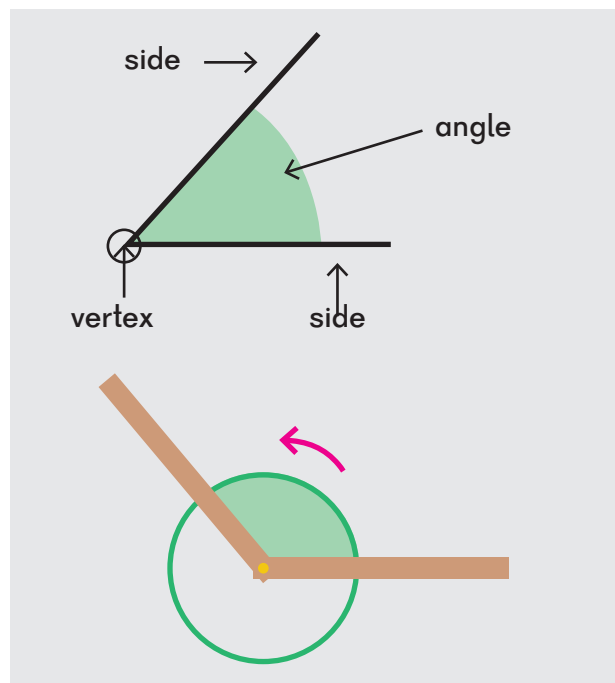
Materials

- Worksheet 4B.15.1
- Hinged straight-edges (such as a folding meter stick)
- Index cards
- Parallelogram cut-out
- Rectangle cut-out
- Set squares
- Tangrams

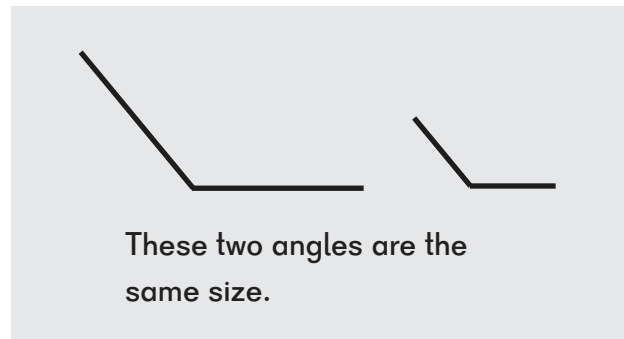
Lesson Instructions

Draw an angle on the board and label the components. Tell students that two lines that meet at a point form an angle. Identify the sides and vertex.

Use the hinged item to demonstrate how an angle is formed when one side opens away from the other around a circle. Tell them that the size of the angle is determined by how big the opening is.



Form an angle and use it to draw two angles of the same size with different side-lengths.



Draw a polygon on the board and ask students how many inside angles it has. (Previously, they may have called the angles of a polygon corners.) Tell students that a polygon is a shape with straight sides.

Show students a rectangle and a parallelogram. Ask them what attribute distinguishes the rectangle from the other figure (they have not yet learned its name). For these two figures, the distinguishing attribute is the size of the angles. In a rectangle, all four angles are the same. Tell students that an angle with the same size as that formed by the corner of a rectangle is called a "right angle."

Give students index cards and have them tell you the type of angle at each corner of the index card. Have them identify right angles on their set squares and on tangram shapes. They can use the corners of index cards to "measure" the angles.

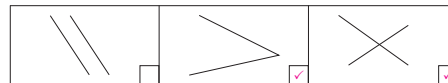
Have students look at the blue tangram piece, which has no right angles. Have them determine which of the angles are greater than and which are less than a right angle. They can use the right angle on a set square or an index card to compare the angles to a right angle.

Hand out the worksheet and have students complete it independently.

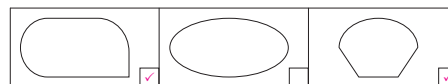
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- 1 Check ✓ the pairs of lines that form angles.



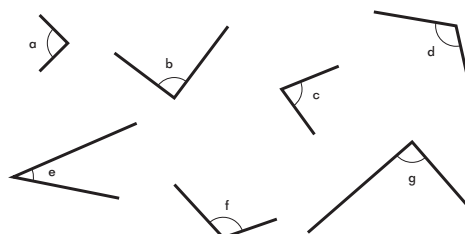
- 2 Check ✓ the figures that have at least one angle.



- 3 Which of these angles are right angles? a, b, g

Which of these angles are larger than a right angle? f, d

Which of these angles are smaller than a right angle? c, e



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- 4 Find the total number of inside angles on each figure.
Find the total number of right angles for each figure. The right angles can be on the inside or on the outside of the figure.

<p>Inside angles: <u>5</u> Right angles: <u>3</u></p>	<p>Inside angles: <u>5</u> Right angles: <u>0</u></p>	<p>Inside angles: <u>8</u> Right angles: <u>3</u></p>
<p>Inside angles: <u>10</u> Right angles: <u>4</u></p>	<p>Inside angles: <u>1</u> Right angles: <u>1</u></p>	<p>Inside angles: <u>2</u> Right angles: <u>2</u></p>

- 5 Draw a polygon with at least two right angles.

Drawings may vary.

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