

Student Guide

Turning Through Angles

Questions 1–10 (SG pp. 379–383)

1.  $\angle B$ ,  $\angle F$ ,  $\angle A$ ,  $\angle D$ ,  $\angle E$ ,  $\angle C$
2. A.  $\angle B$  and  $\angle F$  are acute.  
B.  $\angle A$  is obtuse
3.  $\angle E$  rotates in the opposite direction of all the other angles.
4. A.\* White angle has more turning.  
B.\* Shaded angle has more turning.  
C.\* Shaded angle has more turning.  
D.\* Both angles are the same size.

Use the following shaded angles to answer Questions 1–3 below.

1. Write the angles in order from the least turning to the most turning.
2. A. Which angles are acute?  
B. Which angles are obtuse?
3. Do all the angles show rotation in the same direction? Explain your thinking.

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An angle that opens up to form a straight line is called a **straight angle**. Angle D is a straight angle made by two rays coming out of point D in opposite directions.

Angles that turn beyond a straight angle (but not all the way around a full circle) are called **reflex angles**.

4. Mrs. Dewey's class used Angle Circles to make angles. For each angle circle, decide which angle, the white angle or the shaded angle, has more turning.

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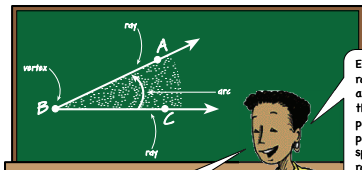
\*Answers and/or discussion are included in the lesson.

✓ Check-In: Question 5

- Use your Angle Circles to show the following angles.
  - A green acute angle
  - A white straight angle
  - A green right angle
  - A white obtuse angle
  - A green reflex angle
  - A green angle with no turning
  - A green angle that turns all the way around the circle
  - A white angle that turns  $\frac{1}{4}$  of the way around the circle

Angles and Degrees

Mrs. Dewey drew an angle on the board to show the parts of an angle.



We often draw a curved line called an arc to show the turning. Sometimes the arc has an arrowhead to show the direction of the turn.

Every angle has two rays that are joined at a corner point. In this angle, the corner point, or vertex, is point B. All of the space between the rays of  $\angle ABC$  is part of the angle too.

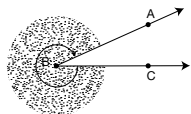
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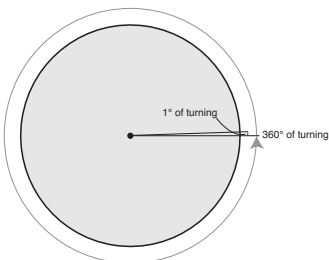
Maya drew angle ABC. She used the same rays that Mrs. Dewey used to draw angle ABC.



If both of our angles have the same rays and vertex, are they the same angle?

- Are Mrs. Dewey's  $\angle ABC$  and Maya's  $\angle ABC$  the same size? Explain your thinking.
- How are the two angles related to each other?

We measure the amount of turning in angles by **degrees**. Larger angles have larger degree measures. If you turn all the way around in a circle, you have turned  $360^\circ$  (read as "360 degrees"). The little circle ( $^\circ$ ) is a symbol for the word degree.



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One degree ( $1^\circ$ ) of turning is only  $\frac{1}{360}$  of the way around a full circle.

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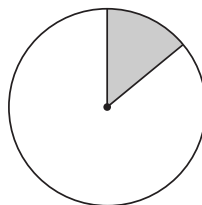
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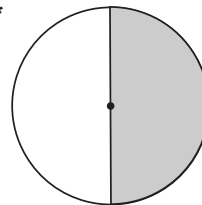
\*Answers and/or discussion are included in the lesson.

5. Answers will vary. Possible answers follow:

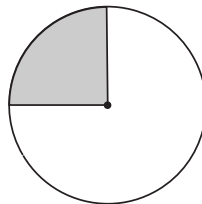
A.\*



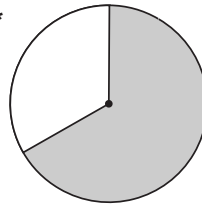
B.\*



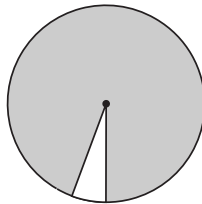
C.\*



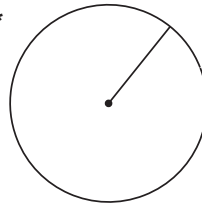
D.\*



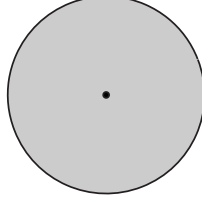
E.\*



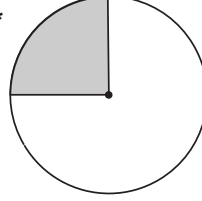
F.\*



G.\*



H.\*



6.\* The angles are not the same size. Maya's angle has more rotation.

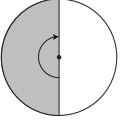
7.\* The angles share the same vertex and rays. Added together they make a full rotation around a circle.

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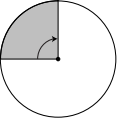
- 8.  $180^\circ$
- 9.  $90^\circ$
- 10.  $270^\circ$

Use your calculator if needed to answer Questions 8–10.

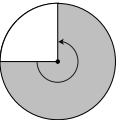
8. How many degrees have you turned when you turn halfway around a circle?



9. How many degrees have you turned when you turn one-quarter of the way around a circle?



10. How many degrees have you turned when you turn three-quarters of the way around the circle?



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