

## LESSON 1

## Angles Around Us

Activity to support units on angle types and measurements

## OBJECTIVE

Students will use photography to record and measure real-life examples of angles found throughout the school.

## TIME

One class period, plus time for the extension activity

## MATERIALS

**Worksheet: Find the Angle**

(Parts A and B), cameras and film, protractors, ruler, pencils

## STANDARDS-BASED SKILLS

Understand facts about supplementary, complementary, vertical, and adjacent angles; solve multistep problems; measure angles

## INTRODUCTION

On your whiteboard or chalkboard, write down the following professions: architect, baseball player, engineer, pilot, fashion designer, and astronomer. Ask students if they can name some ways angles might be part of these jobs. *(An architect uses angles when designing buildings; a baseball player adjusts the angle of his bat to best hit pitches; engineers use angles when designing machines, from roller coasters to rockets; pilots adjust a plane's angle to take off and land; fashion designers measure angles when creating sewing patterns for clothes; astronomers use angles to position their telescopes to find objects in the night sky.)*

## ACTIVITY

1. Picture this: Tell students that they are going to take photos of angles they see around them.
2. Organize students into groups and hand out copies of **Worksheet: Find the Angle**, a protractor, and a camera to each group. As a class, go over the angle types listed on the worksheet.
3. Review the idea that angles are measured in degrees. Have students recall that a straight line measures  $180^\circ$ . Let students practice measuring each of the angles shown on the worksheet in degrees with their protractors.
4. Send students on a supervised scavenger hunt throughout the school. State that they will be looking for real-life examples of the angles found on the worksheet. They will use their cameras to take photographs of angles they find in objects around them. Then they will record a description of each angle they've photographed and identify the type of angle they've found.
5. Have students answer the problems on the worksheet individually. Review their answers as a class and discuss what they've learned from the activity.

## WORKSHEET PART B ANSWERS

1.  $a + 5a = 90^\circ$   
 $6a = 90^\circ$   
 $a = 15^\circ$   
 $5a = 5 \times 15^\circ = 75^\circ$
2.  $c$  and  $d$  are adjacent;  
 $a$  and  $b$  are vertical
3.  $a = 120^\circ$   
 $a + b = 180^\circ$   
 $120^\circ + b = 180^\circ$   
 $b = 60^\circ$
4.  $a + 90^\circ + 58^\circ = 180^\circ$   
 $a = 32^\circ$
5. First, find  $a$ :  $a + 90^\circ + 45^\circ = 180^\circ$   
 $a = 45^\circ$   
 Then, since  $a$  and  $b$  are supplementary:  
 $a + b = 180^\circ$   
 $45^\circ + b = 180^\circ$   
 $b = 135^\circ$



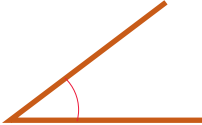

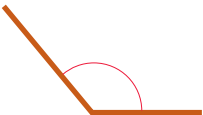
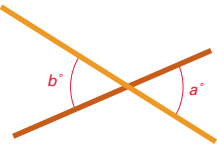
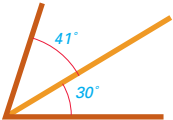
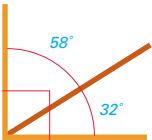
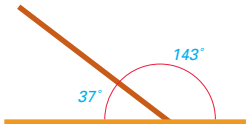
## EXTENSION ACTIVITY: NAME THAT SHAPE!

Have students make their own geometry scavenger hunt checklist with shapes such as quadrilaterals, triangles, and other polygons. After the students have located and photographed examples of each shape, have them identify the shapes and create word problems to calculate the perimeter and area of each shape. Students may use the object's actual measurements or estimate the length of its sides.

NAME \_\_\_\_\_

# Find the Angle

**DIRECTIONS:** Review the types of angles identified below. Then go on a scavenger hunt around your school to find real-world examples of these angles. Take a picture of each example you find. Write down a description of the item you've photographed and the type of angle it represents. Then solve the problems on Part B.

ANGLE TYPE	Description of Example Found and Type of Angle It Represents	
<b>ACUTE</b> An angle that is less than 90°		
<b>RIGHT</b> An angle that is exactly 90°		
<b>OBTUSE</b> An angle that is greater than 90° but less than 180°		
<b>VERTICAL</b> Angles that share a common vertex (point) and are found opposite each other when two lines cross. These angles are always equal in measure.		
<b>ADJACENT</b> Two angles that share a common side and vertex		
<b>COMPLEMENTARY</b> Two angles that add up to 90°		
<b>SUPPLEMENTARY</b> Two angles that add up to 180°		



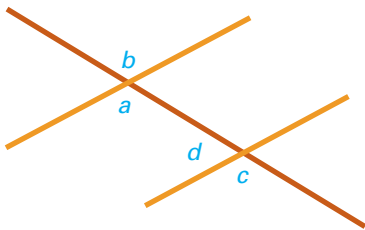
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# Solve It!

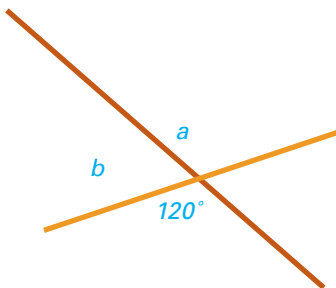
**DIRECTIONS:** Use what you've learned about angles to answer the following problems. Show your work.

1. One of two complementary angles is five times larger than the other. What is the measurement of the larger angle?

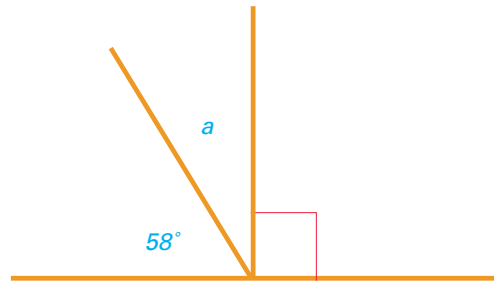
2. Which angles in the diagram below are adjacent to one another? Which angles are vertical?



3. Find the measurement of angle  $b$ .



4. Find the measurement of angle  $a$ .



5. Write and solve an equation to find angle  $b$ . (Remember, the angles of a triangle add up to  $180^\circ$ .)

