

# learning focus:

- ✓ use angle relationships to write and solve equations
- ✓ construct triangles with given conditions
- ✓ determine the conditions for a unique triangle, more than one triangle or no triangle

## ANGLES & TRIANGLES UNIT

### 7 DAY CCSS-ALIGNED UNIT



A MANEUVERING THE MIDDLE® RESOURCE

# ANGLES & TRIANGLES



a 7 day CCSS-aligned unit  
CCSS: 7.G.2, 7.G.5

ready-to-go, scaffolded  
student materials

## ANGLES & TRIANGLES UNIT

### Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation & Helpful Hints	
7-16	Binder Covers, Dividers, and Spine Labels	
17-18	Complementary and Supplementary Angles	Student Handout 1
19	Complementary and Supplementary Angles	Homework 1
21-22	Vertical and Adjacent Angles	Student Handout 2
23	Vertical and Adjacent Angles	Homework 2
25	Angle Relationships Mini-Quiz	Mini-Quiz 1
27-28	Angle Relationships in Triangles	Student Handout 3
29	Angle Relationships in Triangles	Homework 3
31-32	Side Lengths of Triangles	Student Handout 4
33	Side Lengths of Triangles	Homework 4
35-36	Constructing Triangles	Student Handout 5
37	Constructing Triangles	Homework 5
39	Triangles Mini-Quiz	Mini-Quiz 2
41-43	Angles and Triangles Unit Study Guide	Review
45-47	Angles and Triangles Unit Test	Test

©Maneuvering the Middle LLC, 2016

# ANGLES & TRIANGLES

7<sup>th</sup>  
GRADE

a 7 day CCSS-aligned unit  
CCSS: 7.G.2, 7.G.5

student friendly + real-world  
application

graphic  
organizers

Unit: Angles & Triangles  
Student Handout 1

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### COMPLEMENTARY AND SUPPLEMENTARY ANGLES

Use a protractor to measure the size of each angle and complete the table below.

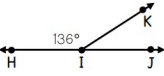
$m\angle ABC =$ _____
$m\angle ABD =$ _____
$m\angle EBF =$ _____
$m\angle EBC =$ _____
$m\angle DBC =$ _____
$m\angle DBE =$ _____

What is the sum of  $\angle ABD$  and  $\angle DBC$ ? How about  $\angle ABC$  and  $\angle DBE$ ?

ANGLE TYPE	DEFINITION
ACUTE ANGLE	An angle that measures less than 90°
OBTUSE ANGLE	An angle that measures more than 90°
RIGHT ANGLE	An angle that measures 90°
STRAIGHT ANGLE	An angle that measures 180°
COMPLEMENTARY ANGLES	A pair of angles whose measures add up to 90°
SUPPLEMENTARY ANGLES	A pair of angles whose measures add up to 180°

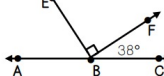
In 1-2, use your understanding of angle relationships to set up an equation and solve for the missing angle measure.

1. What is the measure of angle KIJ?



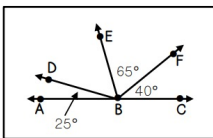
a. equation: \_\_\_\_\_  
b.  $m\angle KIJ =$  \_\_\_\_\_

2. What is the measure of angle ABE?



a. equation: \_\_\_\_\_  
b.  $m\angle ABE =$  \_\_\_\_\_

3. Use the diagram below to mark each angle.



Apply your understanding of angle relationships to solve the problems below.

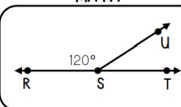
4. Angles A and B are supplementary. The measure of angle A is 42°. Find the measure of angle B.

a. equation: \_\_\_\_\_  
b.  $m\angle B =$  \_\_\_\_\_

6. Angle F and angle G are complementary. Find the value of x and the measure of each angle.

7. Three students were asked to sketch a straight line. The name of the student(s) who correctly sketched a straight line is \_\_\_\_\_.

MAYA

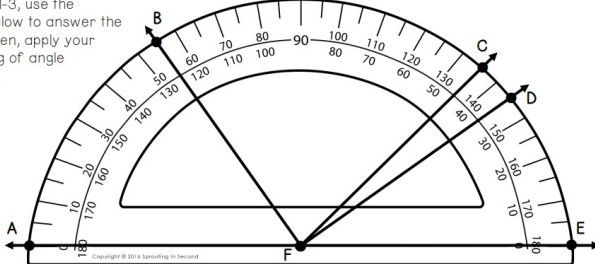


Unit: Angles & Triangles  
Homework 1

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### COMPLEMENTARY AND SUPPLEMENTARY ANGLES

In questions 1-3, use the protractor below to answer the questions. Then, apply your understanding of angle relationships.



1. Determine the measure of each angle below.

<b>A</b> $m\angle AFC =$ _____	<b>B</b> $m\angle CFB =$ _____	<b>C</b> $m\angle AFD =$ _____	<b>D</b> $m\angle EFC =$ _____
-----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------

2. Find the angle that makes each set supplementary angles.

$\angle AFB$  and \_\_\_\_\_  
 $\angle AFC$  and \_\_\_\_\_  
 $\angle AFD$  and \_\_\_\_\_

3. Find the angle that makes each set complementary angles.

$\angle BFC$  and \_\_\_\_\_  
 $\angle AFB$  and \_\_\_\_\_

4. Angles A and B are supplementary angles. The measure of angle A is 38°. Find the measure of angle B.

a. equation: \_\_\_\_\_  
b.  $m\angle B =$  \_\_\_\_\_

5. The measure of angle C is 20.5°. Angles C and D are complementary angles. Find  $m\angle D$ .

a. equation: \_\_\_\_\_  
b.  $m\angle D =$  \_\_\_\_\_

6. Angle F and angle G are complementary. Angle F measures  $(2x+7)^\circ$  and angle G measures  $18^\circ$ . Find the value of x and the measure of each angle.

a. equation: \_\_\_\_\_  
b.  $x =$  \_\_\_\_\_,  $m\angle F =$  \_\_\_\_\_,  $m\angle G =$  \_\_\_\_\_

©Maneuvering the Middle LLC, 2018

interactive practice

# ANGLES & TRIANGLES

7<sup>th</sup>  
GRADE

a 7 day CCSS-aligned unit  
CCSS: 7.G.2, 7.G.5

streamline your planning  
process with unit overviews

## ANGLES AND TRIANGLES OVERVIEW



### STANDARDS

**7.G.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

**7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

### BIG IDEAS

- A triangle is a three-sided polygon.
- Angles are related in such a way that they can be used to solve problems.

### ESSENTIAL QUESTION

- How are the interior angles of a triangle related?
- What is unique about the sides of a triangle?
- How are vertical and adjacent angles related?

## ANGLES AND TRIANGLES PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Complementary and Supplementary Angles	Vertical and Adjacent Angles	Angle Relationships in Triangles	Side Lengths of Triangles	Constructing Triangles
Student Handout 1 Homework 1	Student Handout 2 Homework 2 Mini-Quiz 1			
DAY 6	DAY 7			
Angles and Triangles Unit Study Guide	Angles and Triangles Unit Test			
Unit Study Guide	Unit Test			

## ANGLES AND TRIANGLES OVERVIEW



TOPIC	TEACHING TIPS
Complementary and Supplementary Angles	<ul style="list-style-type: none"><li>• There are two easy ways to differentiate between the vocabulary of complementary and supplementary. First, c comes before s in the alphabet, and 90° comes before 180°. Secondly, complementary has one p (90°) and supplementary has two p's (180°).</li></ul>
Vertical and Adjacent Angles	<ul style="list-style-type: none"><li>• In the hallway, take pieces of masking tape and create various angles on the floor. Ask students to use sticky notes to label the angle relationships.</li></ul>
Attributes of a Triangle	<ul style="list-style-type: none"><li>• This is one of my most favorite topics! Have students work in groups of three. Give them a long piece of string that has been tied to form a circle. Each student will hold the string and form a vertex. Call out the various triangle classifications and have students move to create that type of triangle. Stop to discuss and make any corrections.</li></ul>
Triangle Constructions	<ul style="list-style-type: none"><li>• Triangle constructions can be a bit cumbersome. Make sure that students begin with a straight line, or it won't work correctly. Then, have students use the end point of that line to determine the first angle. I suggest only pencils and lots of erasers for this lesson.</li></ul>
Triangle Conditions	<ul style="list-style-type: none"><li>• This lesson is a very small introduction to formal Geometry concepts and theorems. Students should be able to apply the Angle Sum Theorem and the Triangle Inequality Theorem to determine if a set of given conditions creates a triangle.</li><li>• A fun game to play is a twist on four corners. Label three different corners of the room with the phrases, "no triangle", "unique triangle", and "more than one triangle". Then, give students a condition and ask them to move to the appropriate corner of the room. Give students time to discuss in their group and then share with the class.</li></ul>

teaching  
ideas



# ANGLES & TRIANGLES

7<sup>th</sup>  
GRADE

a 7 day CCSS-aligned unit  
CCSS: 7.G.2, 7.G.5

## unit study guide + assessments

✓ quizzes

✓ editable unit test

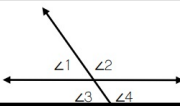
Unit: Angles & Triangles  
Mini-Quiz 1

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

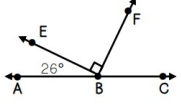
### ANGLE RELATIONSHIPS MINI-QUIZ

Use your understanding of angle relationships to solve the questions below.


- Angle 4 and Angle \_\_\_\_\_ are vertical angles.
- Angle 3 is adjacent to which angles?  
A. Angles 1 and 2  
B. Angles 1 and 4  
C. Angles 2 and 3  
D. Angles



3. Find the  $m\angle FBC$ .



4. Find the measure of  $\angle H$ .



x = \_\_\_\_\_

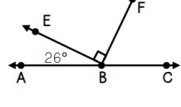
Unit: Angles & Triangles  
Mini-Quiz 1

### ANGLE RELAT


Use your understanding of angle relations

- Angle 4 and Angle \_\_\_\_\_ are verti
- Angle 3 is adjacent to which angles?  
A. Angles 1 and 2  
B. Angles  
C. Angles 2 and 3  
D. Angles

3. Find the  $m\angle FBC$ .



4. Find the measure of  $\angle H$ .



x = \_\_\_\_\_

Unit: Angles & Triangles  
Review

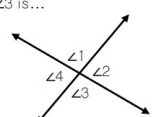
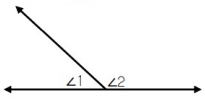
Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### ANGLES AND TRIANGLES UNIT STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

#### I CAN CLASSIFY ANGLE RELATIONSHIPS.

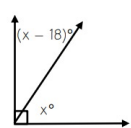
1. The relationship between $\angle 1$ and $\angle 2$ is...	2. The relationship between $\angle 2$ and	3. The relationship between $\angle 3$
-------------------------------------------------------------	--------------------------------------------	----------------------------------------



4. The relationship between  $\angle 1$  and  $\angle 3$  is...

5. The relationship between  $\angle 2$  and  $\angle 4$  is...

#### I CAN USE COMPLEMENTARY & SUPPLEMENTARY ANGLES

7. 

equation: \_\_\_\_\_

x: \_\_\_\_\_

angle measure: \_\_\_\_\_

8. \_\_\_\_\_

SEVENTH GRADE CURRICULUM

# ANGLES & TRIANGLES

UNIT SIX: ANSWER KEYS

©MANEUVERING THE MIDDLE, 2016

answer keys  
included