Big Ideas Math: Advanced 2

Parent Newsletter

Chapter 12: Constructions and Scale Drawings

Standards

Common Core:

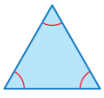
7.G.1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

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.

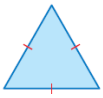
7.G.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

Key Ideas

Classifying Triangles Using Angles

acute triangle	*obtuse* triangle	*right* triangle	*equiangular* triangle
			
all acute angles	1 obtuse angle	1 right angle	3 congruent angles

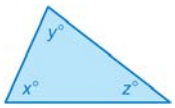
Classifying Triangles Using Sides

scalene triangle	*isosceles* triangle	*equilateral* triangle
		
no congruent sides	at least 2 congruent sides	3 congruent sides

Sum of the Angle Measures of a Triangle

The sum of the angle measures of a triangle is 180°.

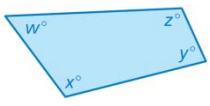
$x + y + z = 180$



Sum of the Angle Measures of a Quadrilateral

The sum of the angle measures of a quadrilateral is 360°.

$w + x + y + z = 360$



Scale

The measurements in scale drawings and models are proportional to the measurements of the actual object.

Key Terms

Two angles are ***adjacent angles*** when they share a common side and have the same vertex.

Two angles are ***vertical angles*** when they are opposite angles formed by the intersection of two lines.

Congruent angles have the same measure.

Two angles are ***complementary angles*** when the sum of their measures is 90°.

Two angles are ***supplementary angles*** when the sum of their measures is 180°.

Congruent sides have the same length.

A ***scale drawing*** is a proportional, two-dimensional drawing of an object.

A ***scale model*** is a proportional, three-dimensional model of an object.

The ***scale*** gives the ratio that compares the measurements of the drawing or model with the actual measurements.

A scale without units is called a ***scale factor***.

Students will...

Identify adjacent and vertical angles.

Find angle measures using adjacent and vertical angles.

Classify pairs of angles as complementary, supplementary, or neither.

Find angle measures using complementary and supplementary angles.

Construct triangles with given angle measures.

Construct triangles with given side lengths.

Understand that the sum of the angle measures of any triangle is 180°.

Find missing angle measures in triangles.

Understand that the sum of the angle measures of any quadrilateral is 360°.

Find missing angle measures in quadrilaterals.

Construct quadrilaterals.

Use scale drawings to find actual distances.

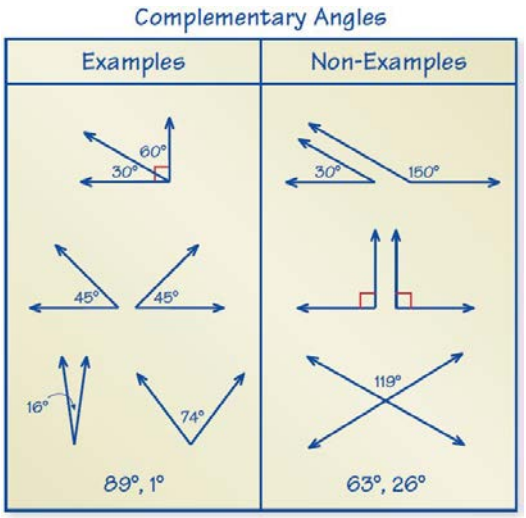
Find scale factors.

Use scale drawings to find actual perimeters And areas.

Recreate scale drawings at a different scale.

Reference Tools

An **Example and Non-Example Chart** can be used to list examples and non-examples of a vocabulary word or term. Write examples of the word or term in the left column and non-examples in the right column. This type of organizer serves as a good tool for assessing knowledge of pairs of topics that have subtle but important differences, such as complementary and supplementary angles.



Games

- It's All About the Details
- Six in a Row
- Picture This

These are available online in the *Game Closet* at www.bigideasmath.com.

Essential Questions

What can you conclude about the angles formed by two intersecting lines?

How can you classify two angles as complementary or supplementary?

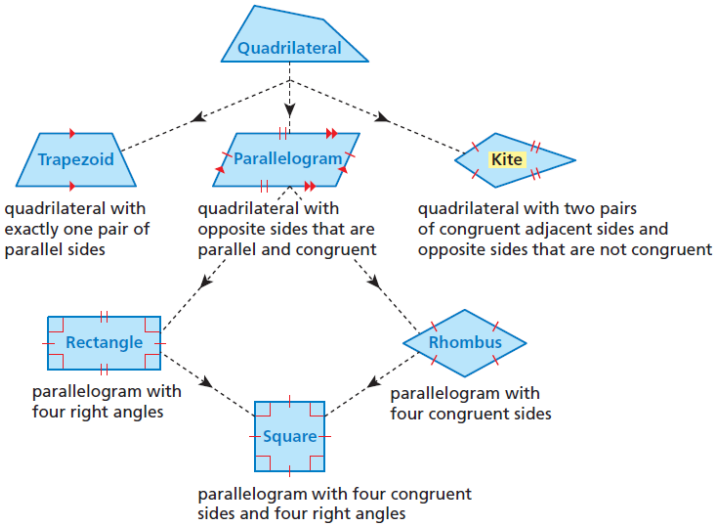
How can you construct triangles?

How can you classify quadrilaterals?

How can you enlarge or reduce a drawing proportionally?

Quick Review

A quadrilateral is a polygon with four sides. The diagram shows properties of different types of quadrilaterals and how they are related. When identifying a quadrilateral, use the name that is most specific.



- When two lines intersect, two pairs of vertical angles are formed. Vertical angles are congruent.
- Adjacent sides share a common vertex.
- The measurements in scale drawings and models are proportional to the measurements of the actual object.

An angle can be classified by its measure.

- A right angle is 90°
- An acute angle is less than 90°
- An obtuse angle is between 90° and 180°
- A straight angle is 180°.

What's the Point?

The ability to use scale drawings is very useful in real life when making building plans or in architectural design. Ask your student to make a scale drawing of their ideal bedroom. How would they have to change the dimensions of their real bedroom to create the ideal bedroom?

The STEM Videos available online show ways to use mathematics in real-life situations.
The Chapter 12: Trick Shots in Film STEM Video is available online at www.bigideasmath.com.