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Unit 7.1, Family Resource

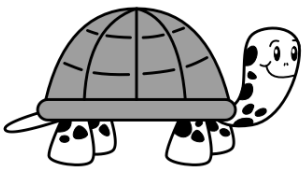
Unit 1 Summary

Prior Learning	Grade 7, Unit 1	Later in Grade 7	Grade 8
Grade 6 • Fraction multiplication and division • Polygon area	• Scaled copies • Scale drawings	• Proportional relationships (Units 2 & 4)	• Similarity and congruence • Dilations of figures

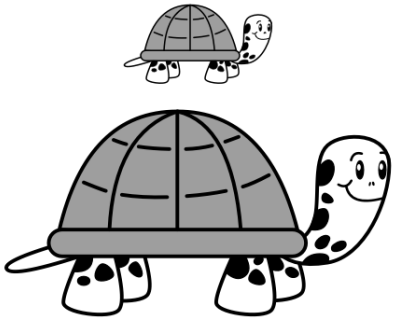
Scaled Copies

An image is a **scaled copy** of the original if the shape is stretched in a way that does not distort it.

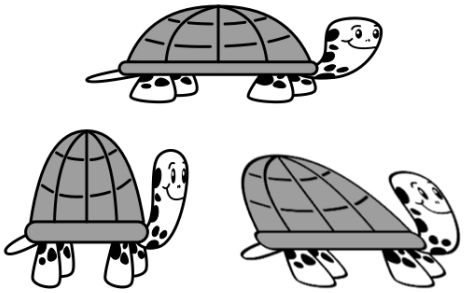
Original



Scaled Copies



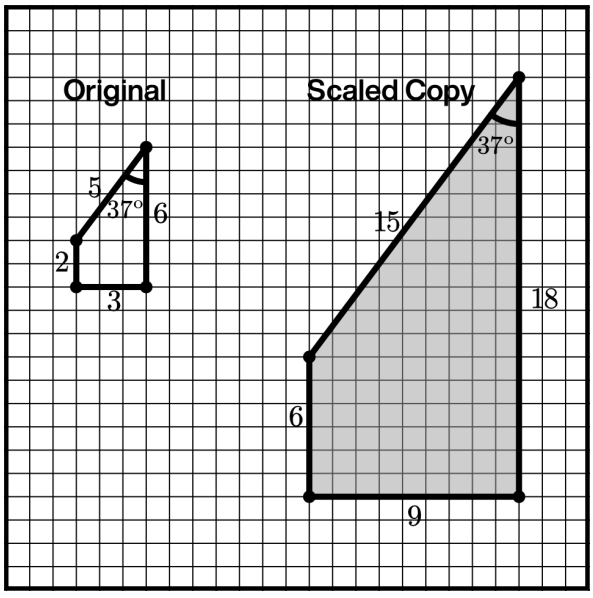
Non-Scaled Copies



Side Lengths: All side lengths in a scaled copy are multiplied by a number called a **scale factor**.

Angles: All angle measures stay the same.

Area: The area does not increase by the scale factor. For example, the area of the original is 12 square units and the area of the scaled copy is 108 square units.



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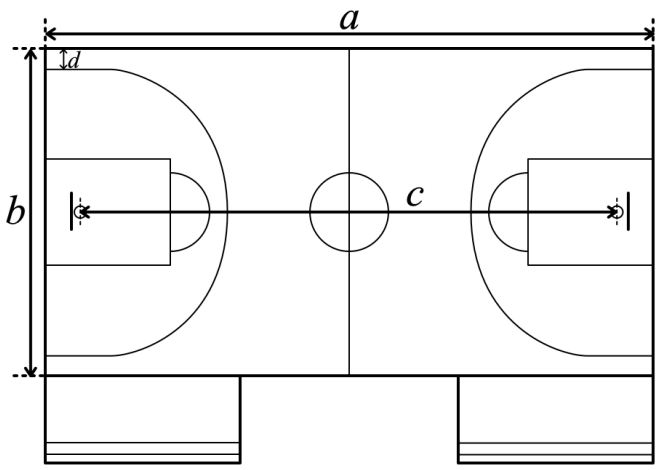
Unit 7.1, Family Resource

Scale Drawings

A **scale drawing** is a two-dimensional representation of an actual object or place. Maps and floor plans are some examples of scale drawings.



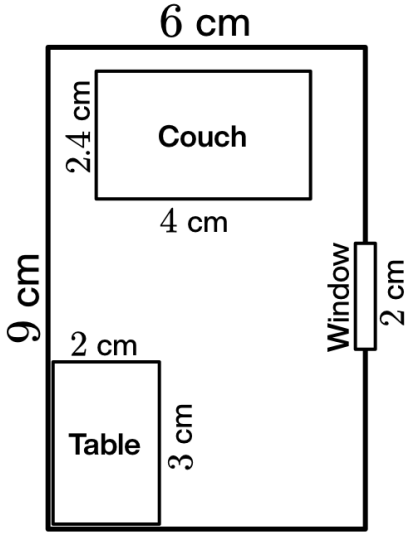
A **scale** tells us what the measurements in a scale drawing represent on the actual object.

For example, a scale of "1 inch to 5 miles" means that 1 inch on the drawing represents 5 actual miles. If the drawing shows a road that is 2 inches long, the road is actually $2 \cdot 5$, or 10 miles long.

It is also possible to use a scale to create a scale drawing.

The couch in this scale drawing of a living room is 4 centimeters in length.

The scale of the drawing is 3 centimeters to 2 meters, so the actual length of the couch is $2\frac{2}{3}$ meters.



Scale = 3 cm to 2 m

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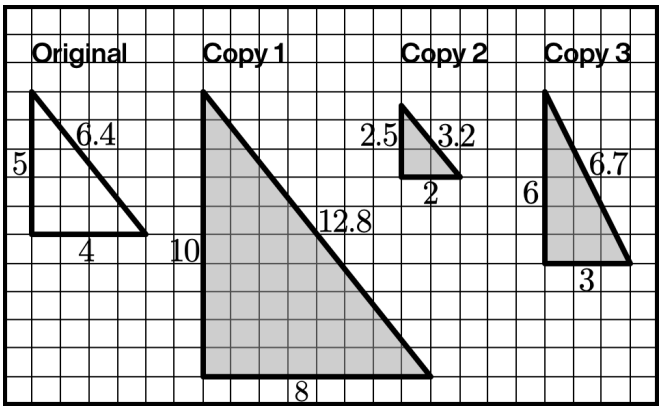
Unit 7.1, Family Resource

Try This at Home

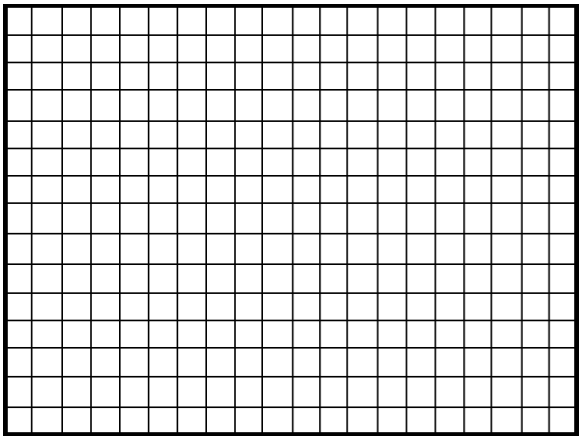
Scaled Copies

1.1 For each copy, decide whether or not it is a scaled copy of the original triangle.

1.2 For each scaled copy, determine the scale factor from the original to the copy.



1.3 Sketch another scaled copy of the original triangle using a different scale factor.



1.4 Suppose you want to scale the copy you drew back to its original size. What scale factor should you use?

Scale Drawings

Xavier drew a floor plan of his classroom using the scale 1 inch to 6 feet.

2.1 Xavier's drawing is 4 inches wide and $5\frac{1}{2}$ inches long. What are the dimensions of the actual classroom?

2.2 A table in the classroom is 3 feet wide and 6 feet long. What size should it be on the scale drawing?

2.3 Xavier wants to make a larger scale drawing of the same classroom. Which of these scales could he use?

A. 1 in. to 5 ft.

B. 2 in. to 12 ft.

C. 2 in. to 15 ft.

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Unit 7.1, Family Resource

Solutions:

1.1 Copy 1 is a scaled copy of the original triangle. The scale factor is 2 because each side in Copy 1 is twice as long as the corresponding side in the original triangle. $5 \cdot 2 = 10$, $4 \cdot 2 = 8$, $(6.4) \cdot 2 = 12.8$.

1.2 Copy 2 is a scaled copy of the original triangle. The scale factor is $\frac{1}{2}$ or 0.5 because each side in Copy 2 is half as long as the corresponding side in the original triangle. $5 \cdot (0.5) = 2.5$, $4 \cdot (0.5) = 2$, $(6,4) \cdot (0.5) = 3.2$.

1.3 Copy 3 is not a scaled copy of the original triangle. The shape has been distorted. The angles are different sizes, and there is not one number we can multiply by each side length of the original triangle to get the corresponding side length in Copy 3.

1.4 *Responses vary.* Sample response: A right triangle with side lengths of 12, 15, and 19.2 units would be a scaled copy of the original triangle using a scale factor of 3.

2.1 24 feet wide and 33 feet long. Since each inch on the drawing represents 6 feet, we can multiply by 6 to find the actual measurements. The actual classroom is 24 feet wide because $4 \cdot 6 = 24$. The classroom is 33 feet long because $5\ \frac{1}{2} \cdot 6 = 5 \cdot 6 + \frac{1}{2} \cdot 6 = 30 + 3 = 33$.

2.2 $\frac{1}{2}$ inch wide and 1 inch long. We can divide by 6 to find the measurements on the drawing. $6 \div 6 = 1$ and $3 \div 6 = \frac{1}{2}$.

2.3 A. 1 in. to 5 ft.

The scale "1 in. to 5 ft." would make a scale drawing that is larger than the scale "1 in. to 6 ft." because Xavier would need more inches on the drawing to represent the same actual length.

The scale "1 in. to 6 ft." is equivalent to the scale "2 in. to 12 ft.," because 1 inch would represent the same actual length in both scales.

The scale "2 in. to 15 ft." would make a scale drawing that is smaller than the scale "1 in. to 6 ft." because each inch on the new drawing would represent more actual length.