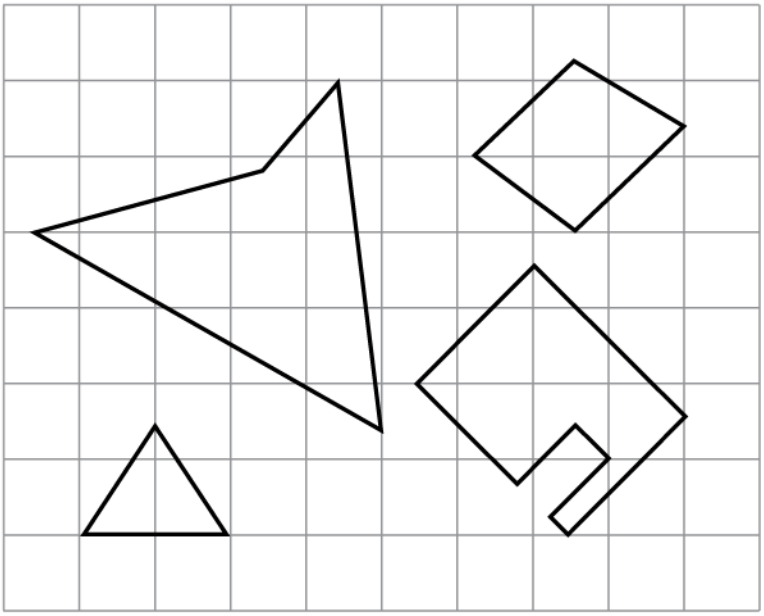
Unit 6, Activity 1, Striking Similarity

Using the grid provided below, transfer the polygons to the blank grid you were given. You may use a straight edge to help you draw the sides.



Name _____
Date _____

Follow the given directions to explore the relationships between side lengths, area, and volume of similar figures.

1.) Given an equilateral triangle, use pattern blocks to create a similar triangle so the ratio of side lengths is 2:1.

a.) What is the ratio of areas of the two similar triangles?

b.) Using pattern blocks create a triangle similar to the original triangle so the ratio of side lengths is 3:1. What is the ratio of the areas of these two similar triangles?

2.) Use other pattern block shapes to create and investigate other similar polygons in the same manner as described above, and record your findings in the table below.

description of similar shapes	ratio of sides	ratio of areas
.	.	.
.	.	.
.	.	.
.	.	.

3.) Based on your investigations in the two activities, make a generalization. If the ratio of sides of two similar polygons is *n*:1, what would the ratio of areas be?

4.) Given a cube, create a similar cube with ratio of edges 2:1 using cm or sugar cubes. What is the ratio of volumes? Create a similar cube with ratio of edges 3:1. What is the ratio of volumes? If the edges of two cubes were in a ratio of *n*:1, what would the ratio of volumes be? Record your findings in a table like the one below.

description of similar 3-D shapes	ratio of edges	ratio of volumes
.	.	.
.	.	.
.	.	.
.	.	.

Unit 6, Activity 2, Similarity and Ratios with Answers

Name _____
Date _____

Follow the given directions to explore the relationships between side lengths, area, and volume of similar figures.

1.) Given an equilateral triangle, use pattern blocks to create a similar triangle so the ratio of side lengths is 2:1.

a.) What is the ratio of areas of the two similar triangles?
The ratio of the areas is 4:1.

b.) Using pattern blocks create a triangle similar to the original triangle so the ratio of side lengths is 3:1. What is the ratio of the areas of these two similar triangles?
The ratio of the areas is 9:1.

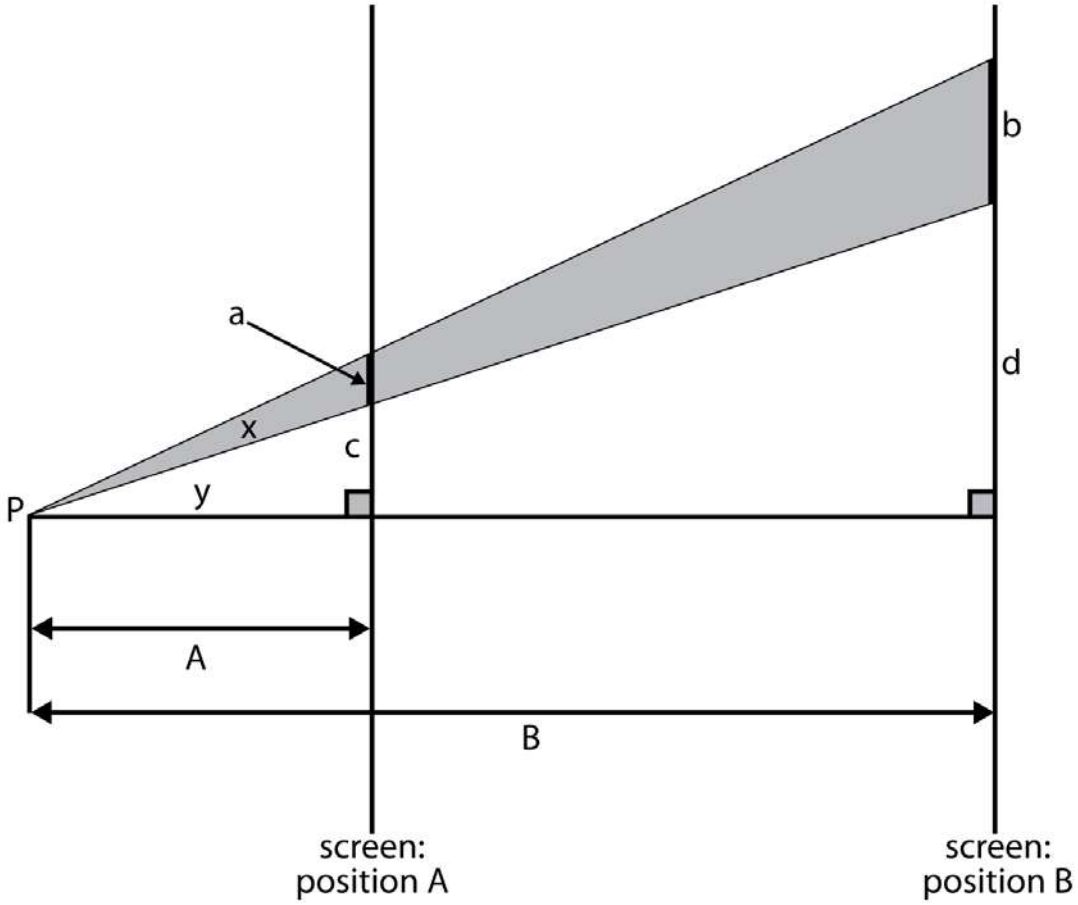
2.) Use other pattern block shapes to investigate other similar polygons in the same manner as described above, and record your findings in the table below.

description of similar shapes	ratio of sides	ratio of areas
. *Answers will vary*	.	.
.	.	.
.	.	.
.	.	.

3.) Based on your investigations in the two activities, make a generalization. If the ratio of sides of two similar polygons is *n*:1, what would the ratio of areas be?
The ratios of the areas will be n^2:1.

4.) Given a cube, create a similar cube with ratio of edges 2:1 using cm or sugar cubes. What is the ratio of volumes? Create a similar cube with ratio of edges 3:1. What is the ratio of volumes? If the edges of two cubes were in a ratio of *n*:1, what would the ratio of volumes be? Record your findings in a table like the one below.

description of similar 3-D shapes	ratio of edges	ratio of volumes
. *cube with face of 4 square units*	*2:1*	*8:1*
. *cube with face of 9 square units*	*3:1*	*27:1*
. *cube with face of n^2 units*	*n:1*	*n^3:1*
.		.


b
a
d
x
c
y
P
A
B
screen:
position A
screen:
position B

DL-TA for (title) _____

Prediction question(s): _____

_____

_____

Using the title, your own background knowledge, and any other contextual clues, make your predictions.

Before reading:

During reading:

During reading:

During reading:

During reading:

During reading:

After reading:

Unit 6, Activity 3, Specific Assessment, Making a Hypsometer

Format: Individual or Small Group

Objectives: Participants use the hypsometer and their knowledge of the proportional relationship between similar triangles to determine the height of an object not readily measured directly.

Materials: For each hypsometer, you need a straw, decimal graph paper, cardboard, thread, a small weight, tape, a hole punch, scissors, and a meter stick.

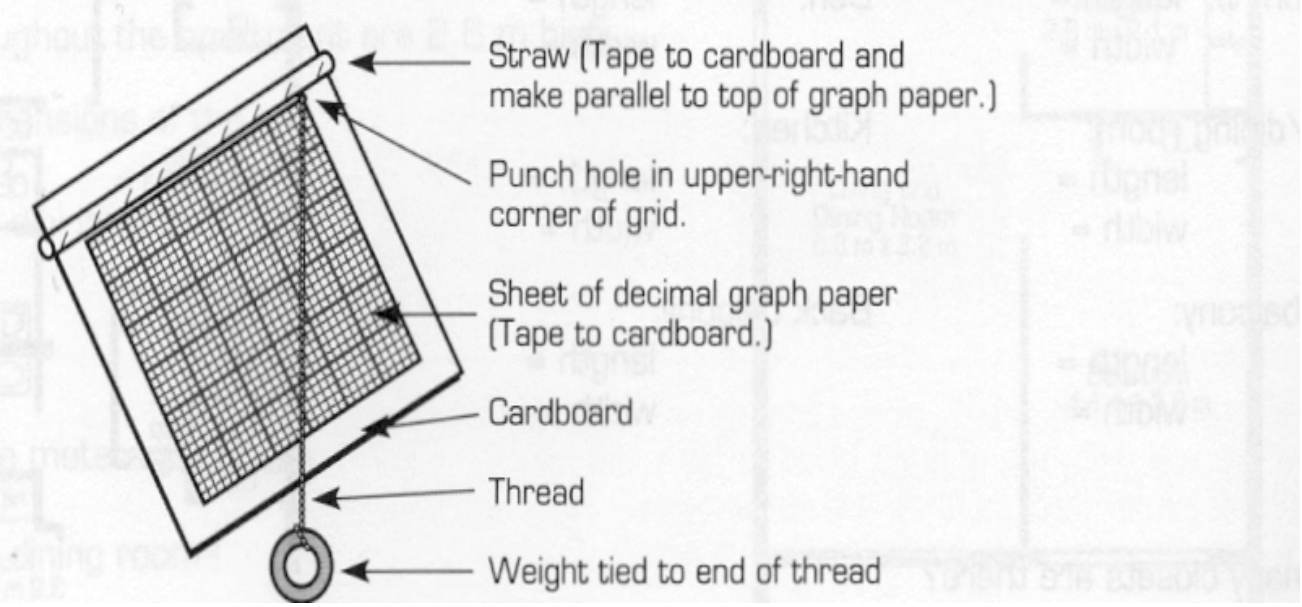
Time Required: Approximately 90 minutes

Directions: To make the hypsometer:

1) Tape a sheet of decimal graph paper to a piece of cardboard.

2) Tape the straw to the cardboard so that it is parallel to the top of the graph paper.

3) Punch a hole in the upper right corner of the grid. Pass one end of the thread through the hole and tape it to the back of the cardboard. Tie the weight to the other end of the thread.

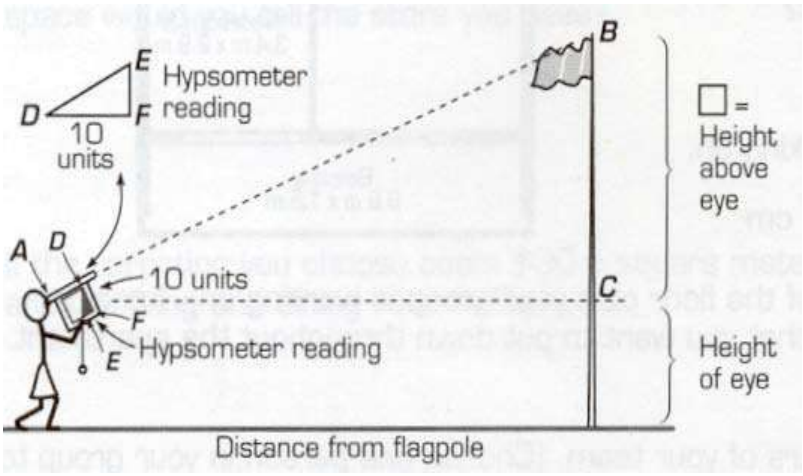


To use the hypsometer:

4) Have a friend use a meter stick to measure the height of your eye from the ground and the distance from you to the object to be measured.

5) Look through the straw at the top of the object you wish to measure. Your friend should record the hypsometer reading as you remain steady and continue to look through the straw at the top of the object

6) To find the height of the flagpole, recognize that triangles ABC and DEF are similar. Thus, BC can be found using the following ratio — $\frac{AC}{DF} = \frac{BC}{EF}$



Reference: NCTM Addenda Series, *Measurement in the Middle Grades*