

Bigger Picture:

Geometry: I can use mathematical similarity & proportional thinking to solve problems.

Last Unit

Variables & Patterns

CURRENT UNIT

Stretching & Shrinking

Next Unit

Comparing & Scaling

Enlarging a figure

2 band stretcher:

sides: 2 times longer
 perimeter: 2 times longer
 area: 4 times bigger

3 band stretcher:

sides: 3 times longer
 perimeter: 3 times longer
 area: 9 times bigger

n band stretcher:

sides: n times longer
 perimeter: n times longer
 area: n^2 times bigger

Mathematical Similarity

Defining Similarity

Two shapes are similar if:

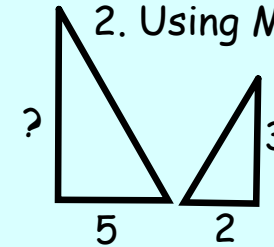
1. same shape
2. same angle measures
3. side lengths grow by same scale factor

Transformations

1. Dilation: $(2x, 2y)$, multiplication rules, proportional enlarge or shrink $(.5x, .5y)$
2. Translation $(x+2, y-4)$, add & subtract rules, moves a shape.
3. Reflection: "flip"
4. Rotation: "turn"

Using Similarity to solve problems with proportions

1. Using Shadows
2. Using Mirrors



Key: find the scale factor (internal or external)

Learning Targets

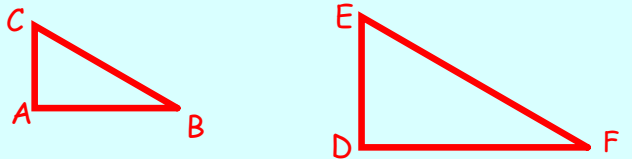
I understand MATHEMATICAL SIMILARITY that means...

- A. I know the definition of similar and congruent.
- B. I can tell if 2 figures are mathematically similar.
- C. I can write rules to translate and dilate figures.
- D. I can find the missing length of similar figures.
- E. I can determine corresponding angles and sides of similar figures.
- F. I can find the scale factor and area factor between 2 similar figures.
- G. I can use similarity to solve real-world problems.

same size, same shape, sf=1
symbol is \cong

Unit Vocabulary

1. Corresponding Sides/ Corresponding Angles:
matching sides, in the same location on the shape



2. Scale Factor

how many times LONGER the side lengths get.

enlarge: s.f. greater than 1
shrink: s.f. between 0 and 1

3. Area Factor:

how many times BIGGER the AREA get.

Area factor = scale factor X scale factor (s.f.)²

4. Similar:

- 1. same shape symbol is \sim ,
- 2. same angle measures
- 3. grow proportionally, same scale factor

5. Dilate:

enlarge or shrink proportionally, multiplication rules!

6. Translate

move a figure, addition/subtraction rules.
up- add to y right-add to x
down - subtract from y left-subtract from x