LEARNING OBJECTIVE: We will explore similarity in geometric figures. (G8M3L1)

CONCEPT DEVELOPMENT:

Similarity: Two geometric figures are considered to be similar if they are proportional to each other. *SAME SHAPE, POSSIBLY DIFFERENT SIZE*

Example:	*Non-Example*:

TRANSFORMATIONS

BASIC RIGID MOTIONS
DILATION
→ TRANSLATION
→ ROT
→ REFL.

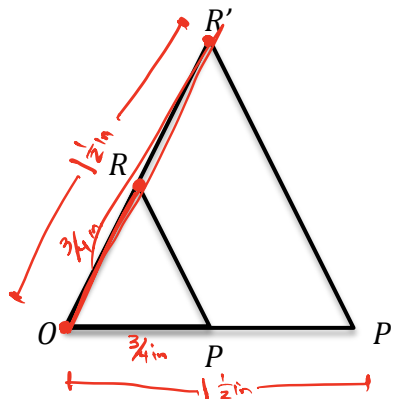$\frac{A}{C} \neq \frac{B}{D}$ $\frac{A}{B} \neq \frac{C}{D}$

Dilation: A transformation of the plane with center O, while the scale factor $r, (r > 0)$ is a rule that assigns each point P of the plane a point $Dilation\ (P)$ so that:
- $Dilation\ (O) = O$ (i.e. the dilation does not move the center)
- If $P \neq 0$, then $dilation\ (P)$ (which can be written as P') is the point on the ray $\overrightarrow{OP}$ so that $|OP'| = r|OP|$.
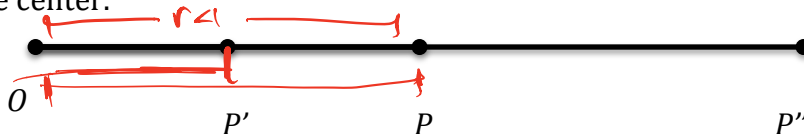
Example:

Center – "O"

Scale factor – r

$r\,|OR| = |OR'|$

$r \cdot \frac{3}{4} = 1\frac{1}{2}$

The dilation is a rule that moves points in a plane a specific distance determined by the scale factor, r. If $0 < r < 1$, the point in the plane is pulled toward the center proportionally the same amount. If $r > 1$, every point in the plane is pushed away from the center.

$r < 1$

$OP = 2$ in

$OP' = 1$ in

$OP'' = 4$ in.

OP dilated by a scale factor of $\frac{1}{2}$ *is OP'*

OP dilated by a scale factor of 2 is OP''

$r|OP| = |OP'|$
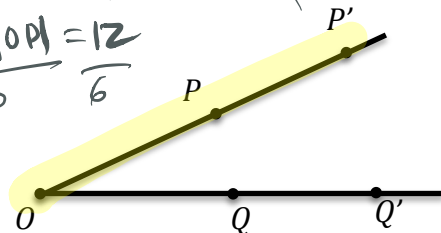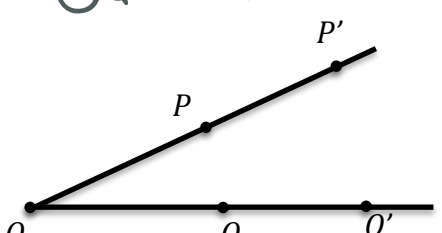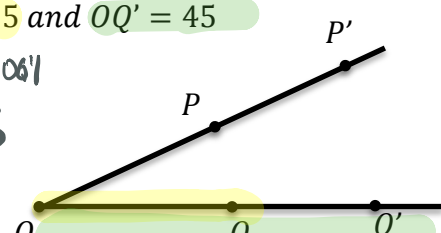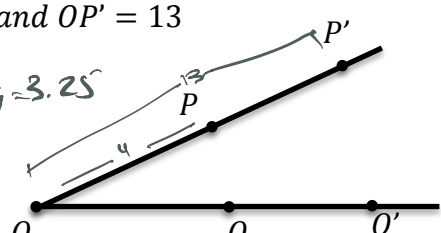
1   G8M3L1: Similarity

GUIDED PRACTICE:

Steps for Determining Dilations by Finding Scale Factors
1. Identify the given information:
- The length of the original segment
- The length of the dilated segment
- The scale factor

2. Substitute the given information into a formula: $|OP'| = r|OP|$.

Given $\lvert OP \rvert = 5\ inches$. If segment OP is dilated by a scale factor of ④ what is the length of OP'? $r\lvert OP\rvert = \lvert OP'\rvert$ $OP' = 20\ inches$ $4 \cdot 5 = \lvert OP'\rvert$	Given $\lvert OP \rvert = 51\ inches.$ If segment OP is dilated by a scale factor of 3, what is the length of OP'? $r\lvert OP\rvert = OP'$ $3 \cdot 51 = \boxed{153\ inches.}$
Given $\lvert OP \rvert = 16\ inches$. If segment OP is dilated by a factor of $\frac{1}{2}$ what is the length of OP'? $r\lvert OP\rvert = \lvert OP'\rvert$ $OP' = 8\ inches.$ $\frac{1}{2} \cdot 16 = 8$	Given $\lvert OP \rvert = 33\ inches$. If segment OP is dilated by a factor of $\frac{1}{3}$ what is the length of OP'? ✗ $\frac{1}{3} \cdot 33 = 11$ $\boxed{OP' = 11\ inches}$
Find the length of OP if $OP' = 12\ inches$ and $r = 6$ $r\lvert OP\rvert = \lvert OP'\rvert$ $\boxed{OP = 2\ inches}$ $\frac{6\lvert OP\rvert}{6} = \frac{12}{6}$ 	Find the length of OQ' if $OQ = 18\ inches$ and $r = 2$ $OQ' = 36\ inches.$
Find the scale factor if $OQ = 15\ and\ OQ' = 45$ $r\lvert OO\rvert = \lvert OO'\rvert$ $r = 3$ 	Find the scale factor is $OP = 4\ and\ OP' = 13$ $r = 3\frac{1}{4} = 3.25$

Independent Practice:
Give exit ticket, questions 2 and 3 only.

Activating Prior Knowledge:

Closure:

Teacher Notes:
Homework can be problem set from Lesson 1. Module 3.

Number Talk:
16x24
8x48
4x96
12 x 32
3 x??

Oct. 18

3 days

5 days

5 days

Oct 31

Nov. 4 End of T1

Nov. 10 Lock

G8M3L1: Similarity