

Dilations

The purpose: The following activities allow students to demonstrate their understanding of the coordinate system and apply that knowledge to similarity and dilations.

Procedure: The student will complete 3 activities. They must graph all activities on regular sized graph paper and answer all questions connected with each activity. Answers must be complete sentences and in appropriate mathematical terms. Each graph must be drawn using a ruler or straight edge and must be colored. Please put in a folder or report cover. Create your own cover page. It should be in order by cover sheet, rubric, King Tut, graph for King Tut, Cube, graph of cube, your own dilation, graph of your dilation.

Grade: This packet will be graded according to the grade sheet included in the packet. This project will count as 1 Quiz grade for the student. There will be a 5 point deduction for each late school day. The project will be accepted early.

Due: Tuesday October 6, 2015.

Name: _____ Graphing Project Date _____

Key:

Questions: 3 points – Answered all questions accurately.
 2 points – Answered more than half of the questions
 1 point – Answered less than half of the questions or did not answer them at all.

Accuracy: 3 points – Points were graphed correctly.
 2 points – Points were graphed partially accurate
 1 point – Points were graphed incorrectly.

Color: 3 points – Colored all geometric figures and used a straight edge.
 2 points – Only outlined all geometric figures and used a straight edge
 1 point – Only outlined all geometric figures and did not use a straight edge

Part 1

	Questions	Accuracy	Color	Total
King Tut (Dilation)				
Cube (Dilation)				
Your Own (Dilation)				
Subtotal				
Part 2				
5points turned project in on time		0 points did not turn project in on time		
5 points overall presentation (in order)		0 overall presentation (not in order)		
Subtotal				

Total Points _____

Letter Grade _____

Dilation – Activity 1: King Tut

1. Use the graph paper vertically. Put the origin in the center
2. Plot and label these points.
 $A = (1, 5)$ $B = (7, -2)$ $C = (4, -3)$ $D = (-4, -3)$ $E = (-1, -2)$
3. Make solid lines \overline{AB} , \overline{AC} , \overline{BC} , \overline{CD} and \overline{AD}
4. Make dashed lines \overline{AE} , \overline{DE} and \overline{EB}
5. Dilate each coordinate of A, B, C, D, E by a scale factor of 2 to get new points A', B', C', D' and E'. *Remember* $(x, y) = (2x, 2y)$

Rewrite as points: $A' = (\quad , \quad)$ $B' = (\quad , \quad)$ $C' = (\quad , \quad)$ $D' = (\quad , \quad)$ $E' = (\quad , \quad)$

6. Plot and label A', B', C', D' and E' on the same graph.
7. Make solid lines: $\overline{A'B'}$, $\overline{A'C'}$, $\overline{B'C'}$, $\overline{C'D'}$ and $\overline{A'D'}$
8. Make dashed lines: $\overline{A'E'}$, $\overline{D'E'}$ and $\overline{E'B'}$
9. How does the two graphs compare?
10. What did the scale factor of 2 do to the original image?
11. Are they proportional? Explain.
12. Are they similar? Explain.

Dilation – Activity 2: The Incredible Shrinking Cube

1. Use the graph paper horizontally. Put the origin the lower left-hand corner.
2. Plot and label the following points. $A = (12,12)$ $B = (12,20)$ $C = (20,20)$ $D = (20,12)$
 $E = (16,24)$ $F = (24,24)$ $G = (24,16)$ $H = (16,16)$
3. Make solid lines AB , AD , AH , BE , EF , EH , DG , FG and GH
4. Make dashed lines BC , CF and CD
5. Dilate each coordinate of A , B , C , D , E , F , G and H by a scale factor of $\frac{1}{2}$ to get new points A' , B' , C' , D' , E' , F' , G' and H' . Remember $(x, y) = (\frac{1}{2}x, \frac{1}{2}y)$

Rewrite as points: $A' = (\quad , \quad)$ $B' = (\quad , \quad)$ $C' = (\quad , \quad)$ $D' = (\quad , \quad)$ $E' = (\quad , \quad)$
 $F' = (\quad , \quad)$ $G' = (\quad , \quad)$ and $H' = (\quad , \quad)$

6. Plot and label A' , B' , C' , D' , E' , F' , G' and H'
7. Make solid lines $\overline{A'B'}$, $\overline{A'D'}$, $\overline{A'H'}$, $\overline{B'E'}$, $\overline{E'F'}$, $\overline{E'H'}$, $\overline{D'G'}$, $\overline{F'G'}$ and $\overline{G'H'}$
8. Make dashed lines $\overline{B'C'}$, $\overline{C'F'}$ and $\overline{C'D'}$
9. Using your new coordinates of A' , B' , C' , D' , E' , F' , G' and H' from #5 dilate each coordinate with a scale factor of $\frac{1}{2}$ to get new points A'' , B'' , C'' , D'' , E'' , F'' , G'' and H'' . Remember $(x, y) = (\frac{1}{2}x, \frac{1}{2}y)$

$A'' = (\quad , \quad)$ $B'' = (\quad , \quad)$ $C'' = (\quad , \quad)$ $D'' = (\quad , \quad)$
 $E'' = (\quad , \quad)$ $F'' = (\quad , \quad)$ $G'' = (\quad , \quad)$ and $H'' = (\quad , \quad)$

10. Make solid lines $\overline{A''B''}$, $\overline{A''D''}$, $\overline{A''H''}$, $\overline{B''E''}$, $\overline{E''F''}$, $\overline{E''H''}$, $\overline{D''G''}$, $\overline{F''G''}$ and $\overline{G''H''}$
11. Make dashed lines $\overline{B''C''}$, $\overline{C''F''}$ and $\overline{C''D''}$
12. Describe the size and location of the three cubes.
13. Are they proportional? Explain.
14. Are they similar? Explain.

Activity 3: Create Your Own Dilation

1. Set up an x-axis and y-axis on your graph paper
2. Draw a design on your graph paper. (minimum 5 points)
3. Make a list of the ordered pairs necessary to create your design. Be sure to include directions that indicate where it is necessary to lift the pencil and where it is necessary to connect each point to the next one in the order that you have them listed.

4. Dilate your points with a reduction, locate and label (show your work). Your scale factor is _____

5. Dilate your points with an enlargement, locate and label (show your work). Your scale factor is _____

6. Color your design.