

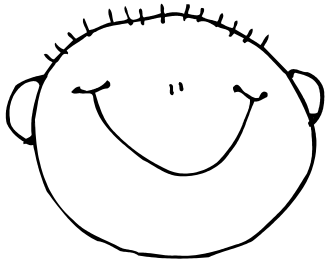
<b>LessonTitle: A Picture is Worth 1000 Words</b>		<b>Geo 2.8</b>
<b>Utah State Core Standard and Indicators</b> Geometry Standard 2, 3 Process Standards 1-5		
<b>Summary</b>		
This is a creative project that requires students to create a picture using points on a coordinate plane. They use the picture to identify angle and line relationships, and write the equations of the lines that form the picture.		
<b>Enduring Understanding</b>	<b>Essential Questions</b>	
We use algebra along with basic geometric principals in order to orient lines and shapes on a coordinate grid system.	What are some basic elements and geometric principles found in every picture and everywhere in life?	
<b>Skill Focus</b>	<b>Vocabulary Focus</b>	
<ul style="list-style-type: none"> <li>• Problem solving</li> <li>• Coordinate grid system with equations for parallel and perpendicular lines</li> <li>• Characteristics and properties of lines and angles created by parallel and perpendicular lines</li> </ul>		
<b>Assessment Evidence:</b>		
<ul style="list-style-type: none"> <li>• Evaluate the completion and quality of student work using the understanding rubric found under assessment on the Teacher Info link. Or you could design your own rubric.</li> <li>• Each student writes a Summary of Learning for “A Picture is Worth 1000 Words.” They can respond to the Essential questions or use their log books to make connections with previous activities.</li> <li>• Observe students research and present information on use of the coordinate plane in various professions.</li> </ul>		
<b>Materials:</b> Graph paper, protractor		
<b>Launch</b>		
<b>Explore</b>		
<b>Summarize</b>		
<b>Apply</b>		

**Directions:** Quickly review specific vocabulary of a coordinate plane. Make sure all students know 1) how to graph points given a coordinate, 2) how to write ordered pairs given a point, 3) what the origin, x-axis, y-axis, and the quadrants are, 4) how to find the equation of a line, and 5) how to identify the boundaries of a line when you are only using a portion of it.

After the review explain that this activity will assess their knowledge of the basic principles of the geometry of space. Because this activity is a culminating assessment they should be left to work on their own as much as possible.

**Discourse Suggestions:**

- What steps are required to create a grid picture?
- Why is learning the coordinate system and its use important?



## ***A Picture is worth 1000 Words***



In this activity you will create a dot-to-dot picture on “Graph Paper” that will be given to you by your teacher. To create this picture you will use some of the information you learned throughout this module. As you create your picture, you will need to record the information given below on the “Recording Sheets” and turn it in with your picture.

***The picture you create on the “Graph Paper” and “Recording Sheets” must include the following. You may include other items to your picture to make it unique.***

- Use at least 25 points and label them A, B, C, etc. on your picture. If you use more than 26 points you, then you can start labeling them AA, BB, CC, etc. (List the coordinates in the order you should connect them on a separate sheet of paper. If there is a break where two points don’t connect, then specify it by using the word BREAK.)

For example: A(-3, 2)

B(1, 7)

C(5, -6)

BREAK

D(-1, 4)

E(-9, -8)

BREAK

- 1 pair of parallel lines (Include the equations of the parallel lines and the boundaries of the line on a separate sheet of paper.)

For example:  $y = 1/2x + 4$  ( $0 \leq x \leq 5$ ) and  $y = 1/2x - 2$  ( $-1 \leq x \leq 3$ )

- 1 different pair of perpendicular lines (Include the equations of the perpendicular lines and the boundaries of the line on a separate sheet of paper.)

For example:  $y = 2/3x - 1$  ( $-2 \leq x \leq 4$ ) and  $y = -3/2x + 1$  ( $-2 \leq x \leq 4$ )

- 2 obtuse angles (Include the name and angle measure of each obtuse angle on a separate sheet of paper.)

For example:  $m\angle ABC = 118^\circ$

- 2 acute angles (Include the name and angle measure of each acute angle on a separate sheet of paper.)

For example:  $m\angle XYZ = 24^\circ$

- Create 1 angle bisector with your compass (Include the names and the angle measures of the two angles created by the bisector on a separate sheet of paper.)

- 1 pair of vertical angles (Indicate the names and angle measures of the vertical angles.)

- Create one transversal line through your parallel lines (Include the equation of the transversal line and the boundaries of the line on a separate sheet of paper.)  
For example:  $y = 2x + 1$  ( $1 \leq x \leq 6$ )
- Name 1 pair of corresponding angles and their angle measures.
- Name 1 pair of alternate interior angles and their angle measures.
- Name 1 pair of alternate exterior angles and their angle measures.
- Name 1 pair of same side interior angles and write an equation showing the sum of their angle measures.
- Name 1 pair of supplementary angles and write an equation showing the sum of their angle measures.
- Name 1 pair of complementary angles and write an equation showing the sum of their angle measures.

***A Picture is worth 1000 Words***  
**Recording Sheets**

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

***List the coordinates you used in your picture below. Don't forget to specify the BREAKS.***

***Parallel Lines***

equation 1:

boundaries:

equation 2:

boundaries:

How can you prove that these lines are parallel?

***Perpendicular Lines***

equation 1:

boundaries:

equation 2:

boundaries:

How can you prove that these lines are perpendicular?

***Obtuse Angles***

angle 1 and its measure:

angle 2 and its measure:

How do you know these angles are obtuse?

***Acute Angles***

angle 1 and its measure:

angle 2 and its measure:

How do you know these angles are acute?

***Angle Bisectors***

angle 1 and its measure:

angle 2 and its measure:

How can you show that you created an angle bisector?

***Vertical Angles***

angle 1 and its measure:

angle 2 and its measure:

How do you know that they are vertical angles?

***Transversal***

equation:

boundaries:

Why is this line a transversal line?

***Corresponding Angles***

angle 1 and its measure:

angle 2 and its measure:

What can you tell me about corresponding angles?

***Alternate Exterior Angles***

angle 1 and its measure:

angle 2 and its measure:

What can you tell me about alternate exterior angles?

***Alternate Interior Angles***

angle 1 and its measure:

angle 2 and its measure:

What can you tell me about alternate interior angles?

***Same Side Interior Angles***

angle 1 and its measure:

angle 2 and its measure:

equation of their sum:

What can you tell me about same side interior angles?

***Supplementary Angles***

angle 1 and its measure:

angle 2 and its measure:

equation of their sum:

What can you tell me about supplementary angles?

***Complementary Angles***

angle 1 and its measure:

angle 2 and its measure:

equation of their sum:

What can you tell me about complementary angles?

***A Picture is worth 1000 Words***  
**Graph Paper**

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

