

POINT COMPARISONS

Benchmarks

3-4

Geometry and Spatial Sense

- D. Identify and draw right, obtuse, acute and straight angles
- G. Find and name locations in coordinate systems
- H. Describe, identify and model reflections, rotations and translations, using physical materials.

5-7

Measurement

(Standard) 2. Identify paths between points on a grid or coordinate plane and compare the lengths of the paths.

Geometry and Spatial Sense

- A. Identify and label angle parts and the regions defined within the plane where the angle resides.
- E. Use proportions to express relationships among corresponding parts of similar figures.
- H. Predict and describe results (size, position, orientation) of transformations of two-dimensional figures.

Materials

Grid paper for students (mine is 8mm square) , grid on overhead, worksheet #2, colored pencils (4 different colors) and polygons

Procedure

1. Hand out several polygons to each student and have them pair up. Review translations (slides) reflections (flips) and rotations.
 - a. Have the students put out two identical polygons and discuss their attributes and what they are with their neighbor and call on a few to discuss them in class.
 - b. Have the students to take turns showing their partners how a shape would make a translation.

- c. Have the students take turns showing their partners how a shape would make a reflection.
 - d. Have students take turns showing their partners how a shape would make a rotation.
2. Hand out worksheet #2 and have students read directions and complete.
3. Explain to the children they will be creating their own coordinate grid with four quadrants and we will be plotting points.
4. Hand out the grid paper and rulers.
5. Be sure to have a grid on an overhead so the students can refer to yours to be sure they are correctly labeling their grid.
6. Have the students find the median line vertically just as you would mark off numbers in a set, take a ruler and trace this line out from the grid and label it "x".
7. Do the same horizontally (you will end up with two median lines) I have the kids use the median line on the left but review what to do if they have two medians in a set of numbers (add medians and divide by two). Trace this line with a ruler also outside the grid and label it with a "y".
8. Place the "0" where they meet and fill in numbers to 10 and -10 on the "x" line and 14 to -14 on the "y" line.
9. Have students plot the following points in a specific color:
 - a. (1,2) (4,3) (1,5) (1,9) (7,4) (4,6) (8,6) (3,8) (2,10)
 - b. Connect the first three to form an angle with (1,2) as the vertex
 - c. Discuss the angle: It is acute, it is 70 deg.
 - d. Continue the angle lines to include (1,9) and (7,4) – did this make the measurement of the angle change? Why or why not?
 - e. Connect the last four points to form an obtuse angle
 - f. Discuss the angle: It is obtuse, it is 115 deg.
 - g. Label this last angle: vertex, line segments (which would be rays when?), interior angle and exterior angle
10. Have students plot the following points in a different specific color:
 - a. (-2,2) (-4,2) (-3,4) – connect these three to form a polygon
 - b. measure the sides of this polygon (you should get around 18mm) What type of polygon is it? Equilateral and acute triangle, all sides 60 degrees
 - c. (-6,3) (-8,3) (-8,7) – connect these three to form a polygon
 - d. measure the sides of this polygon and label it. What type of polygon is it? Right and scalene
 - e. (-3,6) (-5,7) (-6,9) – connect these three to form a polygon
 - f. measure the sides of this polygon and label it. What type of polygon is it? Obtuse and scalene
 - g. (0,5) (-2,5) (-1,9) – connect these three to form a polygon
 - h. measure the sides of this polygon and label it. What type of polygon is it? Isosceles and acute
 - i. Discuss the sum of a triangles angles is always 180 degrees so that if you have a right angle or an obtuse angle in your triangle, the other two angles have to be acute. Why?

11. Have the students plot the following points and add a shape or letter around it in a specific color.
- (-2,-8) Make a “D” around it (-4,-11) Make a “C” around it (-6,-7) make a square shape around it (-8,-3) make an “A” around it (-8,-12) make a “B” around it
 - Ask questions such as: What is the path along the grid lines from the square to the letter C? In order for the “D” and the “B” to get to the square, how many blocks do they have to move, which one has the shorter path? Of all four letters, which one has the shortest path to get to the square? Which one has the longest?
12. Have the students plot the following points and connect the points to construct a polygon in a specific color.
- A. (0,-3) (1,-1) (4,-1) (5,-3) – connect the points with a ruler – What polygon do you have? (trapezoid) Discuss it’s attributes (four sides with one set of parallel lines. Label the four angles with a letter
 - Plot these points also and connect these points along with the point (5,-3) to form another four sided polygon. (6,-5) (9,-5) (10,-3) Label the four sides of this new polygon with a different letter. What have we done with this polygon? (rotated it.) Match the letters to corresponding angles and discuss
 - Plot these points and connect. Label each angle with a letter.(1,-5) (4,-5) (6,-7) (3,-9) (0,-8) What is this polygon (pentagon) Discuss it’s attributes (five sided polygon.
 - Plot these points and connect. Label each angle with yet a different letter. (3,-10) (6,-12) (4,-14) (1,-14) (0,-11) Discuss this polygon and compare it to the one previous. What have we done? (reflection) Match the letters with these two polygons to corresponding angles and discuss

Assessment

You need to walk around the room while working on the coordinate grid to be sure all students are correctly labeling plots. They can work in pairs so that they can check themselves with each other. You can take up the grid and/or the worksheet #2.



REFLECTIONS
ROTATIONS
AND TRANSLATIONS

Trace one of the polygons below, label it and show it as a rotation. Which angles are corresponding?



Trace one of the polygons below, label it and show it as a translation. Which angles are corresponding?



Trace one of the polygons below, label it and show it as a reflection. Which angles are corresponding?

