Lesson Plan

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Grade level(s)/Subject taught: Math 7

Objectives: Students will be able to

- Construct, measure and manipulate two-dimensional objects using The Geometer's Sketchpad.
- Classify and construct regular polygons based upon information regarding angle and/or side measure.
- Measure a pentagon, then a hexagon, and determine without performing the construction, how many degrees are in the interior of a 21-sided figure.
- Identify similar figures and use their properties.

1. <u>Mathematical Concept:</u>

Students will determine the sum of the interior angles of several polygons.

2. <u>Materials:</u>

1. 25 Review sheets on polygons
2. 25 Bellwork sheets on triangles
3. 6 computers with Geometer Sketch Pad
4. 1 printer networked to the computers
5. 6 calculators
6. 25 pencils
7. 25 table sheets per group

3. <u>Lesson Format:</u>

INTRODUCTION: As students enter the class, they will be placed into groups of three or four at each computer station. Students will receive a review handout on polygons and a bellwork handout with three questions pertaining to the properties of a triangle. Once students have completed their bellwork, as a class we will review Geometer's Sketch Pad and discuss the following:

-how to construct a polygon using the segment tool
-how to label the vertices of the polygon using the text tool
-how to calculate the measures of angles using the calculator tool
-how to write your observations using the text tool

DIRECTIONS:

Part 1

Triangle: This is review.

1. Construct a triangle.
2. Label the vertices.
3. Measure the angles.
4. Using the calculator, sum the angles.
5. What is the sum? With the select tool (arrow), pull a vertex to change the shape of the triangle. What is the sum now?
6. Using the text tool, make a box on your sketch. Type in your name and findings (i.e. what did you observe about the sum of the degrees in a triangle.)
7. Save your work.
8. From the File menu, choose "Print Preview." Make sure your work is on one page. Click on scale to fit page if needed. Now print.

Quadrilateral: Time for the new stuff

1. Construct a quadrilateral. Using the text tool, make a box and record how many degrees you believe are in the quadrilateral and why you made your guess.
2. Follow Triangle steps 2-5 above.
3. Now construct one diagonal.
4. Using the text tool, make a box on your sheet. Type in your name and findings (i.e., what did you observe about the sum of degrees in a quadrilateral. What added information did the diagonal give you? How many triangles resulted? Do you think there's a relationship between the number of degrees in the triangles and the number of degrees in the quadrilateral?
5. Save your work.
6. Print from Print Preview menu.

Pentagon: Keep it up, you're almost done!

1. Construct a pentagon. Follow the instructions for steps 2-5 of Triangle.
2. Now construct two diagonals, each beginning at the same vertex. What added information do you have? Record your results and print.

Part 2

Now begin to fill out the following table sheet. Construct a hexagon if you need to in order to fill out the information. Do you see a pattern? Suppose you constructed a regular polygon of the types listed above. What would be the measure of each of the angles of the figure? Fill in the last column of the chart with this information.

Name of polygon	Number of sides	Number of triangles made by diagonal(s)	Total Number of interior degrees	Number of degrees for each angle of a regular polygon
triangle	3	1	180 degrees	
quadrilateral	4			
pentagon	5			
hexagon	6			
	7			
	8			
	9			
	10			
	20			
	n			

PRODUCT:
Today you will complete one table sheet per person.

CLEAN-UP:

1. Make sure that all materials are back in the basket.
2. Make sure that you have logged out of the computer.

ASSESSMENT:

Students will be assessed on a 4 point scale:

Score	Description
4 points	Table is accurate, worked well at computer station, stayed focused, and participated in class discussion.
3 points	Worked well at computer station, stayed focused, and participated in class discussion.
2 points	Stayed focused and participated in class discussion.
1 point	Participated in class discussion.

Sample

CONCLUSION:

At the end of the lesson students will be able to

- Demonstrate proficiency in Geometer's Sketch Pad
- Create multiple polygons
- Label and calculate properties of polygons
- Display the purpose of visual representations of data
- Determine a rule for finding the number of interior degrees in any polygon.

REVIEW:

Students will complete a "ticket out the door" where they will figure out a rule to predict the number of interior degrees in any polygon.