PERFORMANCE TASK: Triangle Hierarchy Diagram

Adapted from K-5 Math Teaching Resources
The students will create a Hierarchy Diagram using the terms: Polygons, Triangles, Acute Triangle, Obtuse Triangle, and Right Triangle.

STANDARDS FOR MATHEMATICAL CONTENT

MCC5.G.3 Understanding that attributes belonging to a category of two-dimensional figures also belong to all subcategories.

MCC5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

STANDARDS FOR MATHEMATICAL PRACTICE

SMP 1. Make sense of problems and persevere in solving them.
SMP 2. Reason abstractly and quantitatively.
SMP 3. Construct viable arguments and critique the reasoning of others.
SMP 5. Use appropriate tools strategically.
SMP 6. Attend to precision.
SMP 7. Look for and make use of structure.

BACKGROUND KNOWLEDGE

The students will use the knowledge that they have gained throughout this unit to perform this task. Students should be able to identify and draw all three types of triangles, based on angle measures and side lengths.

COMMON MISCONCEPTIONS

Students think that when describing geometric shapes and placing them in subcategories, the last category is the only classification that can be used.

ESSENTIAL QUESTIONS

- How can two-dimensional triangles be categorized and classified?
- How can you classify different types of triangles into a hierarchy?
- What are ways to classify triangles?
- How can angle and side measures help us to create and classify triangles?

MATERIALS

- Construction paper 9 X 11 or larger for hierarchy
- Glue sticks
- Markers
- Scissors
- One set of triangle shapes per student

GROUPING
Individual Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

1. The students will create a Hierarchy Diagram using the terms: Polygons, Triangles, Acute Triangle, Obtuse Triangle, and Right Triangle. (Labels are provided for the students)
2. Measure the angles of each triangle to determine the angles and mark them.
3. Cut out the triangles and paste them in the appropriate place on the diagram.
4. Explain your reasoning using mathematical language.

FORMATIVE ASSESSMENT QUESITONS

- Name at least one positive thing about today's lesson and one thing you will change.
- Can you create an equilateral right triangle? An equilateral obtuse triangle? How do you know?
- Is there a scalene equilateral triangle? How do you know?
- How do you know this is a _____ (i.e. scalene obtuse) triangle? Justify your answer.
- If it is a _____ (i.e. scalene obtuse) triangle, what is true about the length of its sides? The measures of its angles? Prove that the triangle you created has those attributes.

DIFFERENTIATION

Extension

- Allow the students to draw and/or add their own triangles to the diagram.
- Allow the students to present their mathematical reasoning as part of the task.

Intervention

- Allow students to work in pairs.
- Allow students to use their notes or the internet.

TECHNOLOGY

- http://illuminations.nctm.org/LessonDetail.aspx?id=U191This unit of four lessons, from Illuminations, focuses on triangles and their properties.
- http://real.doe.k12.ga.us/content/math/destination_math/msc3/msc3/msc3/MSC3/MSC3/Module5/Unit1/Session3/Tutorial.html This tutorial video discusses classifying triangles according to the measure of their sides; determining that the sum of the angles of a triangle equals 180 degrees; finding the perimeter of a triangle; and classifying triangles according to the measures of their angles.

Polygons	Triangles
Acute Triangle	Obtuse Triangle
Right Triangle	

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Triangle Hierarchy Diagram