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### **GROR Lesson Plan for Project Gateway**

Subject: Math-Geometry

Grade Level: 4<sup>th</sup> Grade

Lesson Title: Classifying Triangles by their angle measures

Length of Lesson: Two 75 minute class periods

Instructional Model: Gradual Release of Responsibility (GROR)

Summary of Instructional Strategies Used:

During the Focus Lesson, I will use the *Nonlinguistic Representation Strategy* during the Illuminations website activity and Smartboard lesson through use of the Interactive Whiteboard. During the Focus Lesson I will also be *setting the objective, questioning and cueing students*, as well as *providing feedback* when necessary. Students will also *take notes* during the focus lesson. *Formative assessments* will be used during my focus lesson, my guided instruction, and my *cooperative learning group* activities. Students will be using a comparison matrix to *compare and contrast* artwork they each created during the cooperative learning activity. *Homework* will be assigned to the students after the guided instruction and the first cooperative learning activity. Their homework will be to create a podcast *summarizing* what they learned in class about right, obtuse, acute, and equiangular triangles. Their homework for the next day will be to visit my wikispace and post a reflective comment about their cooperative learning group activity and list one thing they learned or one thing they enjoyed about it. I will also be *using a rubric* to grade their Triangular Artwork Project.

Lesson Objective: Ohio Academic Content Standard 4.G.4

Students will identify and define triangles based on angle measures (equiangular, right, acute, and obtuse).

Lesson:

Day 1:

Focus Lesson (About 15 minutes)	:
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1. Teacher will begin by stating the objective of the lesson. “Today we will learn about 4 different types of triangles. When shown a triangle, you will be able to identify whether it is an acute, obtuse, right, or equiangular triangle. You will measure each angle of the triangle to determine which type of triangle it is.”

2. Using the Smartboard Exchange Lesson Bank and the interactive whiteboard, the teacher will find the activity entitled “Triangle Sort”. See link below:

<http://exchange.smarttech.com/details.html?id=7e4e78d3-8356-49b3-82c9-8c0f97d078c6>

Teacher will introduce vocabulary terms through use of the link above, and the students will take notes: right triangle, acute triangle, obtuse triangle, and equiangular triangle. During this time, teacher will think aloud during the presentation of this new material. Ex. “I should be able to identify this triangle because I know how to measure angles. I measure angles with a protractor. I can find the measure of each angle in this triangle. Therefore, I should be able to figure out how to classify each of these triangles. I know this angle is 90 degrees, therefore this must be a right triangle based on my definition of a right triangle. I see a square in the corner, so this must be a right triangle too. I know this triangle has one obtuse angle, so I know this has to be an obtuse triangle based on the definition in my notes.”

Possible Questioning for formative assessment: How many angles are in a triangle? How do we measure angles? How can we determine what type of triangle it is? (Measure the angles.) How do we know it is a right triangle? (One of the three angles must be 90 degrees.) How do we know it is an acute triangle? (All 3 angles are less than 90 degrees.) How do we know it is an obtuse triangle? (Only one angle measures over 90 degrees.) Which triangle would be easiest to identify and why? How do we know it is an equiangular triangle? (All angles are the same measure.)

Guided Instruction: (10-15 minutes for this activity)
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Teacher goes to Illuminations website for extra practice and will interact with whiteboard during instruction or teacher may choose to use the Geo Sketchpad to have students interact and name different triangles.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=9> or the Geo Sketchpad

Formative assessment: Teacher manipulates triangles. Have the class determine whether it is a right, acute, obtuse, or equiangular triangle by using a wipe off board to write the term that matches the given triangle. Have them hold up their white boards to see who is correct. (Check for Understanding) Then have them explain how they know by referring to the definition.

Collaborative Learning Activity #1 - (15-20 minutes for this activity)
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Pair students up. Have them create 2 different triangles: a right, obtuse, acute or equiangular triangle using protractors, paper, and pencils. They are to measure each angle and label the angle measure of their triangle. The pair will present their triangles to the class by showing their

triangles on the ELMO (document projector). The class will have to identify what type of triangles they created and how they know.

3. Extension-Assign homework: Write a paragraph summarizing what you learned about the 4 different types of triangles discussed in class today. Or if students have a computer at home, you may create a podcast summarizing how to identify triangles based on their angle measures. If they choose to create a podcast, then they do not have to hand in a paragraph. Hand out worksheet explaining homework assignment. See attachment labeled homework assignment.

Day 2:

Go over homework (about 10-15 minutes). Have some students share their paragraphs and some share their podcasts. Then collect.

Independent Work/Application (about 20-30 minutes) :

Individual Art Project (individual assessment):

Students will be given a worksheet consisting of 8 triangles. (See attachment labeled Individual Art Project). Students are to measure angles of each triangle and label each triangle as acute, obtuse, right, or equiangular. They will then cut out the labeled triangles and create a picture, object, or character with their triangles. They will glue the triangles on construction paper and make their own "Triangular Work of Art". They may add triangles by drawing them with their template tool but must label each triangle they add. However, they will only be graded on the the triangles they cut out. (See Triangle Artwork rubric.)

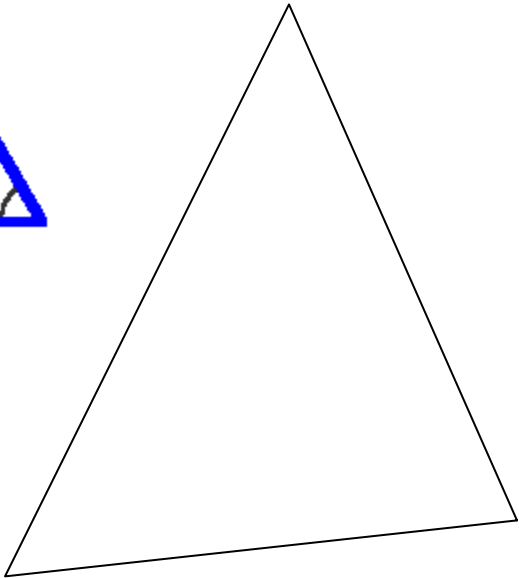
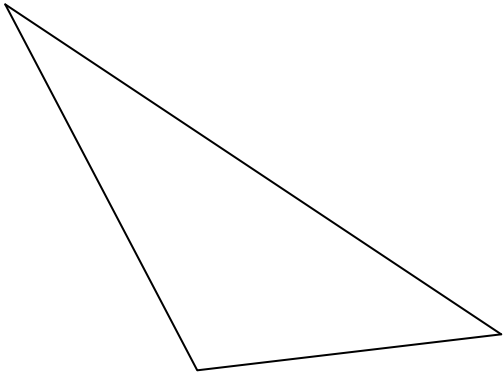
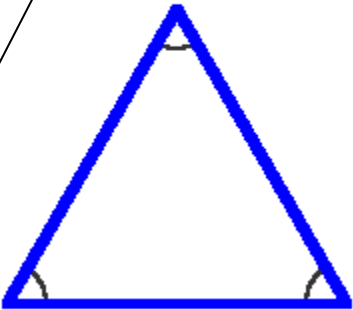
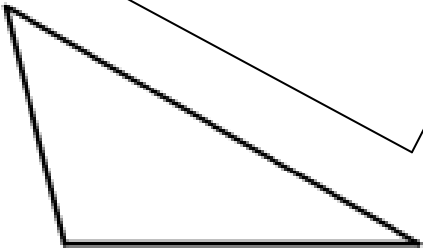
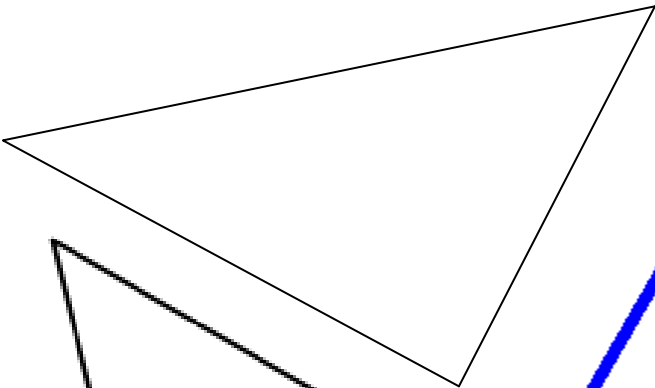
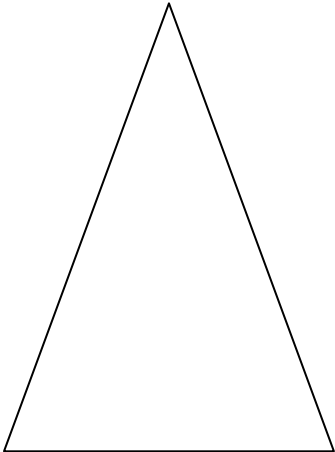
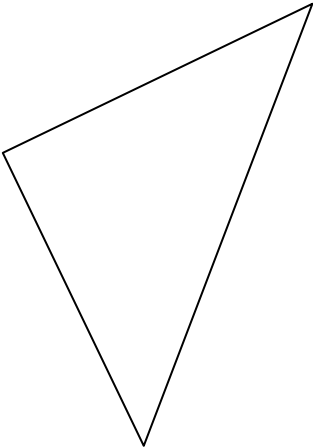
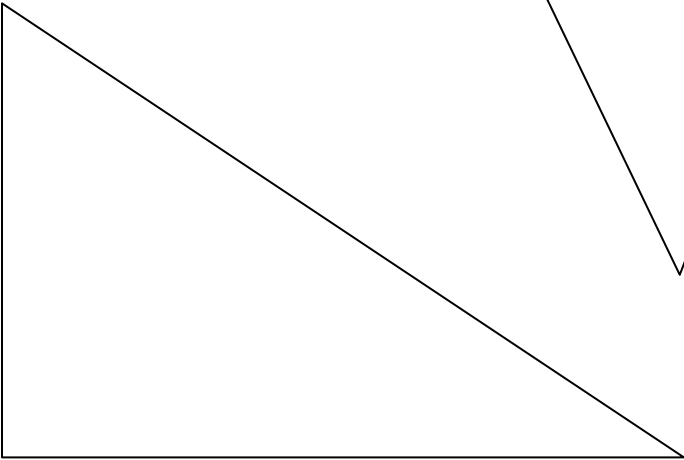
Collaborative Group Activity #2 (about 20-30 minutes)

Once artwork is completed, students will get in groups of 4 to compare and contrast their artwork. They will use a comparison matrix to tell how they are alike and different. Each student will complete a comparison matrix. (See attachment labeled Triangle Artwork Comparison Matrix).

Students must make sure their names are on their individual artwork and on their comparison matrix as well. Final assessment will be on their Triangle Artwork Rubric.

Finally, to wrap up the lesson, I will assign homework. Their homework will be to post a comment on my wikispace reflecting on how their cooperative group activity went. Students will need to visit my wikispace: <http://www.wikispaces.com/user/my/jenniferstarr> and post their comment.

Individual Triangular Artwork Project



# Triangle Artwork Comparison Matrix

	Artwork #1	Artwork #2	Artwork #3	Artwork #4
	_____	_____	_____	_____
Number of Right Triangles				
Number of Acute Triangles				
Number of Obtuse Triangles				
Number of Equiangular Triangles				
Is your artwork a living thing? (Ex. animal or person)				
Does it have eyes?				
Does it have legs?				
What is your artwork?				

## Triangle Artwork Rubric

Teacher Name: **Mrs. Starr**

Student Name: \_\_\_\_\_

CATEGORY	3	2	1	0
<b>Triangle Identification</b>	Identifies 7-8 triangles correctly	Identifies 5-6 triangles correctly	Identifies 3-4 triangles correctly	Identifies 2-0 triangles correctly
<b>Measurement of Angles</b>	Measures 21-24 angles correctly	Measures 16-20 angles correctly	Measures 10-15 angles correctly	Measures 0-9 angles correctly
<b>Neatness</b>	Extra Effort put forth, able to read and identify all details in artwork	Some effort put forth, able to read and identify most details in artwork	Some effort put forth, able to read and identify some details in artwork	Little effort put forth, able to read and identify few details in artwork
<b>Creativity</b>	Extremely creative and original; much thought put into the artwork	Creative, with some thought put into the artwork	Some creativity with some thought put into artwork	Little creativity; not much originality

## Homework Assignment

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Objective: Classifying Triangles by their angle measure

Option #1: Write a paragraph summarizing what you have learned about the 4 different types of triangles based on their measure angles. You may use the template below, but you must copy this onto loose leaf paper.

I learned about 4 different types of triangles today. The first triangle I learned about is a \_\_\_\_\_ . It has \_\_\_\_\_ . The second triangle is an \_\_\_\_\_ . It has \_\_\_\_\_ . The third triangle I learned about is an \_\_\_\_\_ . It has \_\_\_\_\_ . The fourth triangle is an \_\_\_\_\_ . It has \_\_\_\_\_ . These are the 4 triangles I learned about today in class.

Option #2: Create a podcast (audio only-records your voice) that summarizes what you learned in class today about 4 different types of triangles.

Step 1: Go to [www.podomatic.com](http://www.podomatic.com)

Step 2: Sign in

email: [jstarr@hhcsd.org](mailto:jstarr@hhcsd.org)

password: Austin

Step 3: Then click on the “Publish” Tab

Then click “podcast”

Then click “create”

Step 4: Then create a Title for your podcast by putting your name and assignment

EXAMPLE: John Smith’s Triangle Summary

Step 5: Click “Save and Continue”

Then click “Record using a microphone” –You can record with a webcam or microphone

Step 6: Click “record” and then speak into the microphone. Listen to your podcast to make sure it is accurate. Then click “save”.

Step 7: Click “I do not want to select a photo”.

Step 8: Click “Save and continue”

Step 9: Click “Save and continue” again



## Classifying Triangles by Angle Measures

By: Jennifer Starr, Jim Mort, and Amy Sedgmer

In this 2-day lesson, 4<sup>th</sup> grade students will identify acute, obtuse, right, and equiangular triangles based on their angle measures. This lesson incorporates various forms of technology such as the Interactive Whiteboard, Geometer's Sketchpad/Illuminations Website, and Web 2.0 (podcasts and wikispaces). Students will participate in hands-on, motivational activities that involve independent and collaborative learning. Ultimately, they will create an art project using triangles as a final assessment.