Quadrilateral Task

Summary

Students will be able to explain and draw different quadrilaterals. They will determine from the many quadrilaterals the best shape for the new table in Mom's TV room.

Main Core Tie

Mathematics Grade 3

Strand: GEOMETRY (3.G) Standard 3.G.1

Time Frame

1 class periods of 60 minutes each

Group Size

Small Groups

Life Skills

Thinking & Reasoning

Materials

- paper
- graph paper
- ruler
- pencils
- pattern blocks or power polygons
- math journals

Background for Teachers

Teachers should know the different quadrilaterals and their names. Classifying shapes according to parallel lines, and types of angles should be a pre-requisite for this lesson.

Student Prior Knowledge

Students should have already spent some time learning the different types of quadrilaterals and classifying them according the number of sets of parallel sides they have and the types of angles.

Intended Learning Outcomes

Students should be able to compare and contrast quadrilaterals and determine shapes that would be good for a TV table.
Students will be able to explain why their quadrilateral is best for the TV table.
Mathematical Practice #7 - Look for and make use of structure.
Mathematical Practice #3 - Construct viable arguments and critique the reasoning of others.

Instructional Procedures

Present the following task:
Your mom is looking for a new table for the TV room. It needs to be a quadrilateral but she does not want it to be regular. To give her some options do the following:

- Draw as many quadrilaterals as you can.

Pick 2of your shapes.
Label each shapes.
Compare and contrast the different attributes of the shapes.
Be ready to give reasons why your shapes would be the best.

Questions you may ask to help students get started:

What is a quadrilateral?
What do you know about quadrilaterals?
How are your shapes alike?
How are your shapes different?
Could you use a different shape?
How do you know?
What is a "regular" quadrilateral?
How is it different from other quadrilaterals?
What have you discovered so far?

While students are working, select some examples from simple to more complex and ask the students to be ready to share.

When students have completed the task with 2 non-regular quadrilaterals - have them discuss why they think their shape is best. This should NOT be a show and tell, but a time where the teachers helps students make connections.

For teacher information: the trapezoid would be a great shape that is not regular... because:

Have students explain why a slanted parallelogram would not be a good shape for a table.

Make sure to restate students' ideas and ask questions that are more indepth to make connections to prior learning.

Strategies for Diverse Learners

For the struggling learner:

Remind them to not overthink the problem. Ask what materials might be helpful to get started? (The use of manipulatives would be a good resource for them - power polygons or pattern blocks.) Ask:

What are the possible options?
Is there more than one possibility?
Is there another way to solve the problem?
How are the shapes the same?
How are they different?
Which shapes would work?

Extensions

Draw many irregular quadrilaterals as you can. Compare and contrast at least 4 shapes. Give a price to different attributes and find the cost of each shape.

Bibliography

Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. "Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks." Mathematics Teaching in the Middle School 14 (October 2008): 132-138.
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