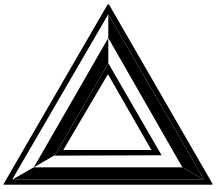
SCAFFOLDING TASK: ATTRIBUTES RULE!



Approximately 1 day

STANDARDS FOR MATHEMATICAL CONTENT

MCCK.G. 4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

MCCK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count

STANDARDS FOR MATHEMATICAL PRACTICE

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

BACKGROUND KNOWLEDGE

As Van de Walle states, "In any sorting activity, the students should decide how to sort, not the teacher. This allows the students to do the activity using ideas *they* own and understand. By listening to the kinds of attributes that they use in their sorting, you will be able to tell what properties they know and use and how they think about shapes" (Van de Walle pg. 194)

ESSENTIAL QUESTIONS

- How can we describe the position of a shape?
- How can we use words that describe location in our everyday life?
- What is a pattern?
- What is an attribute?
- How can we sort things?
- How do we identify patterns?
- How do we describe a pattern?
- How can shapes be sorted?
- What are attributes or properties of a shape or shapes?
- How are shapes same and different?

MATERIALS

- Attribute blocks

GROUPING

Whole group, small group or partners

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Comment: ordinal words and patterns are not mentioned explicitly in the standards however they should be integrated into lessons whenever possible.

PART 1
Gather students at a central meeting place. Discuss/review what an attribute is and allow students to provide examples. Give each student a handful of attribute blocks and have them sort the blocks and share with classmates how they sorted. Allow for ample time to explore and share.

PART 2 (Attribute Train)
Gather students together to form a circle to play the attribute train game. Begin the attribute train by placing one block in the center of the circle. Next, choose a student to add to your train by putting a block next to the first block. The next block added must have one common attribute with the block previously laid. Have a class discussion about what is the same about the two shapes and what is different. The next student in the circle repeats the steps and ads a third block to the train. Next time the train goes around have the student match 2 attributes with the previous block. (Example: *Student 1* lays an attribute block down and says "A thick, large red circle" *Student 2* lays an attribute block down and says "A skinny, small red square." *Student 2* explains that the circle and the square are both red but different shapes).

Comment: During the lesson continue to ask the students questions about their shape and if there are any other attributes that may link their block to the previous one.

PART 3 (Guess My Sort)
Place students in pairs. One partner picks three blocks with similar attributes and shows their partner. The partner has a 2-3 guesses to identify how the blocks were sorted. If the partner correctly identifies the sorting attribute the roles switch. If not, the players' roles remain the same. The students will be shown four attribute blocks, three of which have some similar properties or characteristics (based upon, shape, size, color, thickness.) Discuss which three belong together and why. Have students justify their reasoning. The teacher can decide how the students share their choices and their reasoning. Provide several examples, and then allow students to work on their own to create their own examples. After partners have worked together and explored the various ways to sort attribute blocks, have them expand to a group of 4 or 5 and

share the play guess my sort with a group of students. Students take turns trying to identify the sorting rule
After students have shared within small groups, have all the groups meet back at a meeting place and share the different ways they sorted their shapes. Ask students what their favorite way to sort the shapes was and create a bar graph to display the result. The data collected for this graph will usually result with the sort that students are most familiar with.

FORMATIVE ASSESSMENT QUESTIONS

- Is there another attribute you could have sorted by?
- How many attributes does the _____have?

DIFFERENTIATION

Extension

- Students can be asked to sort shapes that have more than one matching attribute.

Intervention

- Have the students identify a list of attributes and have them pick an attribute from the list to help guide their sort