

Mitten Math

An Educator's Reference Desk Lesson Plan

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Grade Level: Kindergarten, 1

Subject(s):

- Mathematics/Patterns
- Mathematics/Geometry
- Arts

Duration: 1 hour

Description: Pre-number concepts of classification, seriation, and patterning are used in this lesson to reinforce shapes and patterns to children. Students use felt shapes to create patterns on felt mittens.

Goals: Pennsylvania Academic Standards for Mathematics :

- *2.1.3. Numbers, Number Systems and Number Relationships* [A. Count using whole numbers (to 10,000) and by 2's, 3's, 5's, 10's 25's and 100's. C. Represent equivalent forms of the same number through the use of concrete objects, drawings, word names and symbols. G. Use concrete objects to count, order, and group. I. Apply place-value concepts and numeration to counting, ordering and grouping.]
- *2.4.3. Mathematical Reasoning and Connections* [A. Make, check and verify predictions about the quantity, size and shape of objects and groups of objects.]
- *2.8.3. Algebra and Functions* [A. Recognize, describe, extend, create and replicate a variety of patterns including attribute, activity, number and geometric patterns.]
- *2.9.3. Geometry* [A. Name and label geometric shapes in two and three dimensions (e.g., circle/sphere, square/cube, triangle/pyramid, rectangle/prism). D. Find and describe geometric figures in real life.]
- *2.11. Concepts of Calculus* [D. Continue a pattern of numbers or objects that could be extended infinitely.]

Objectives:

1. Students will be able to identify and define patterns.
2. Students will be able to form patterns with shapes.
3. Students will be able to draw pictures of patterns.
4. Students will be able to construct patterns on mittens.
5. Students will be able to complete a Mitten Math worksheet.

Materials:

- felt mitten cut-outs in red, green, gold, white, and light green
- felt cut-out shapes in red, green, gold, white, and light green (circles, squares, triangles)
- cut-out magnetic shapes in red, green, gold, white, and light green (circles, squares, triangles)
- yarn
- tacky glue
- plastic bags
- pencils
- [Mitten Math Worksheet](#)

Mitten Math Worksheet in .pdf format; requires free Adobe Acrobat Reader.

Click the icon to obtain the free Reader.

Vocabulary: *pattern* - a regular or repetitive form, order, or arrangement

Procedure:

[Before the introduction of the lesson, prepare a set of felt mittens for each student. Also prepare an assortment of felt shapes and place them into plastic bags.]

Anticipatory Set / Getting Ready:

Introduce the lesson by wearing a winter hat, scarf, and mittens. Ask students if they can see any patterns on these items; point out some of the patterns. On the board, show students examples of patterns using large magnetic cut-out shapes. Ask for two volunteers to make different patterns with the magnetic shapes on the board. Do students see any patterns on their clothes? Remind children that patterns are seen everyday and everywhere.

Inform students that today they will be looking at patterns and making their own patterns. Everyone in the class will be getting materials to make their own mittens that will have patterns! Many different patterns can be created.

(Students are grouped at tables.) Assign each student a number, 1– 4. Each student has a job:

1. Obtain a plastic bag full of felt shapes for each person at the table.
2. Obtain a set of mittens for each person at the table.
3. Obtain glue for each person at the table.
4. Obtain a Mitten Math worksheet for each person at the table.

Lesson Focus / Students Work:

Students open their plastic bags and lay out the contents. Ask each student to make a pattern that you describe. (For example: pattern of a circle, square, circle, square, circle, square, circle, etc.) Have one student place this pattern on the board using the magnetic cut-outs. Students should draw this pattern on their Mitten Math worksheet in the appropriate area. Then have each group come up with their own pattern; they should lay it out on their table. One person from each group can make this pattern on the board. Have the class check as a group to see if the patterns of the other groups placed on the board are correct. These patterns should be drawn on the Mitten Math worksheets in the appropriate area. Then students create three of their own patterns. It is important for children to understand that there is no wrong answer as long as they form a pattern. Remind children that it is very important to look at colors and shapes when looking at patterns. Students are encouraged to help one another as needed. Have the students check their patterns with other students at their tables. Have the students draw these patterns on their worksheets in the appropriate area. Then the patterns can be glued onto their mittens. Students can use yarn and any other craft items to complete the mittens. (If desired, the patterned mittens can be used as holiday ornaments or gifts.)

Closure / Class Discourse:

Rotate around the classroom and have each student (or one student from the table, as time permits) share the patterned mittens. Each student or group should also be able to explain the pattern. Review the definition of pattern. Remind students that patterns are everywhere and to look for them as the holiday season comes closer!

Assessment: Observe student interaction/cooperation in groups. Were students able to form patterns in groups and individually? Were students able to explain the patterns they created? Review the Mitten Math worksheets to see if students correctly completed the items.

Useful Internet Resources:

* [Kindergarten Math - Matching Shapes](http://www.kidport.com/GradeK/Math/MeasureGeo/MathK_Shapes.htm)

http://www.kidport.com/GradeK/Math/MeasureGeo/MathK_Shapes.htm

* [Alfy's Picks for Patterns and Shapes](http://www.alfy.com/teachers/teach/thematic_units/Patterns_Shapes/PS_1.asp)

http://www.alfy.com/teachers/teach/thematic_units/Patterns_Shapes/PS_1.asp

* [Pennsylvania Academic Standards for Mathematics](http://www.pde.state.pa.us/k12/lib/k12/MATH.pdf)

<http://www.pde.state.pa.us/k12/lib/k12/MATH.pdf>

Special Comments:

Technology Integration:

1. This lesson could easily be further adapted in the one computer classroom with Internet access and a large screen projector. One idea for enhancing this lesson could be incorporated with the use of the Internet. With one computer in the classroom, the teacher could, before or after the lesson, send small clusters of students to the computer to work together in groups (or just one child at a time). The teacher could instruct the students to

go to an interactive web site to learn about shapes and patterns. This could be used as an introductory or follow-up activity. One great web site is http://www.kidport.com/GradeK/Math/MeasureGeo/MathK_Shapes.htm . This is just one of many sites for children to explore through the use of technology. This lesson would also benefit from the use of a large screen projector. Using a large screen would allow the teacher to visually display to the class, in a quicker and more efficient manner, shapes and patterning. The teacher could also make an enlarged worksheet in which it would be much easier for the children to follow along and complete.

2. This lesson could also be integrated through the use of a cluster of computers in the classroom. Students would now have the active opportunity to use computers to enhance the lesson individually. Smaller groups or more individuals can cooperate to use the resources of the Internet. Mathematical software for children can be utilized to enhance this lesson. These programs can be used to help reinforce the concepts of patterning and shapes. Students can also use web sites to explore patterns and shapes. One great web site is http://www.alfy.com/teachers/teach/thematic_units/Patterns_Shapes/PS_1.asp , which provides numerous links where children can explore the concepts of shapes and patterns in different ways. Another idea is to have students write stories that include shapes and patterns. Students could write about the patterns they see every day, a holiday themed story, or whatever their imaginations bring out.
3. In a situation where every child has a computer, technology becomes full scale. Here, the above two scenarios can be applied. Students should still be encouraged to explore Internet sites related to shapes and patterns and write stories. Students could work with the teacher on-line together to complete a computer screen worksheet made by the teacher. Children can create a computerized version of their mitten before they actually make it, so they can change colors and patterns to their liking before the glue is put on. If possible, students can take math software home to study patterns with family members. Students could draw patterns and write stories at home and then share them the next day at school. The possibilities become endless as each child has an opportunity to access and utilize technology.

Special Needs Adaptations:

1. *Child with Visual Impairment*

This child can be paired with another child with no vision impairment. They can work together to feel the shapes and make patterns with the felt. The helper can tell the child which shapes are which colors. As the teacher, you may decide not to use colors with the visually impaired child, as long as s/he can pattern the shapes. The helper can also help the visually impaired child glue the shapes onto their mitten. The visually impaired child need not complete the Mitten Math worksheet. The teacher can provide additional support if needed to the child. The child should be encouraged to participate in the group when they are sharing ideas of patterning. Because a visually impaired child's sense of touch is enhanced, have that child describe to the group or class the shapes in detail.

2. *Child with Attention Deficit Disorder*

Establish clear routines for this child; make sure you as the teacher have given the directions to the best of your ability. Observe that the work does not become long and tedious for the child; s/he must be able to stay on task. Observe that the cut-out shapes are

very clear and bright (for this child to emphasize important key ideas). Assign a buddy to the student, and stress that they both stay on task. The two can go apart from the rest of the class to stay focused. Larger groups have more distractions and require more patience while others talk. The child should be encouraged to make his or her own mitten, but if making one with the buddy is more appropriate, then that should be done. The child and buddy should complete the Mitten Math worksheet together because the ADD child may not be able to stay on task for that period of time.