

See, Touch and Taste Math!

Special Area: Preschool

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I. ABSTRACT

A. This unit brings Core math concepts to children visually, tactilely and with a touch of flavor. The study of Mathematics includes both concrete and abstract concepts. Children need to experience mathematical concepts early in their academic life in order to help them make a strong connection with math. In this unit, children are exposed to math through many experiences and stimuli including the introduction of numbers, shapes, graphing, and pattern recognition. Our goal is to make a mental connection with math that will continue throughout the child's education.

II. OVERVIEW

- A. *Core Knowledge Preschool Sequence* content
1. Recite number sequence 1 – 6. *3KD-MR-D1, 4KD-MR-E01*
 2. Compare 2 groups of no more than 6 objects/group and use quantitative vocabulary to describe the groups. (more and less). *3KD-MR-E1, 4KD-MR-E02, 4KD-MR-E03, 4KD-MR-E04*
 3. Name and write numerals. *3KD-MR-D5, 3KD-MR-D6, 3KD-MR-D7, 4KD-MR-E05, 4KD-MR-E07*
 4. Organize and read quantitative data in a graph. *4KD-MR-E10*
 5. Identify pairs of objects as same or different. *3KD-MR-A1*
 6. Sort and classify objects. *3KD-MR-A2A, 3KD-MR-A2B, 4KD-MR-A2A—4KD-MR-A3E, 4KD-MR-A5*
 7. Develop an understanding of addition and subtraction. *3KD-MR-F1*
 8. Practice using the new language being taught through the Language of Instruction.
 9. Classify and name the shapes and colors. *3LD-LA-D1D1, 4LD-LA-D1D, 4KD-MR-C2*
 10. Create and verbally describe a pattern. *3KD-MR-B3, 4KD-MR-B3*

III. BACKGROUND KNOWLEDGE

- A. *Core Knowledge Preschool Sequence*. Charlottesville, VA: Core Knowledge Foundation.
- B. Griffin, S. *Number Worlds Program Manual: Preschool Level*. Durham, NH: Number Worlds Alliance, Inc.

IV. PREREQUISITE PRIOR KNOWLEDGE FOR STUDENTS

- A. Developing counting skills.
- B. Developing skills for quantifying concrete objects and manipulatives.
- C. Developing numeral recognition skills.
- D. Developing and understanding patterning and sequencing.
- E. Developing and understanding to read quantitative data in a graph.

V. RESOURCES

A. Materials

1. Overhead Projector
2. Sets of numbered cards (1 – 6)
3. Transparencies of number cards
4. Sorting Chips/tokens
5. Bingo Cards
6. Card stock shape cards
7. Plastic attribute blocks
8. Card stock number cards
9. *The Gummi Bear Counting Book*, (Boeghold, Lindley 1999)
Anness Publishing Inc.
10. Sandwich bags
11. Gummi Bears
12. Cut outs in the shape of bears with the numbers 1 – 6 written on their stomachs.
13. Masking Tape
14. Music
15. Tape Recorder
16. Edibles (fruit snacks etc.)
17. Container
18. Large piece of butcher paper to make a graph
19. M&Ms
20. M&M Color Chart

Lesson One: Introduce Numbers 1 – 6

A. Daily Objectives:

1. Using an overhead projector, using number transparencies, the children will visually identify the numbers one through 6.
2. The children will count out a specified quantity of a specified color of chips.
3. The children will learn that numbers represent a sequence of steps along an ordered path.
4. The children will get the opportunity to roll a die and observe the abstract pattern that emerges and to identify the new number (and numeral) that results.
5. As the children move spatially through the sequence, they learn to use the language of magnitude and the language of space interchangeably.
6. The children will be given valuable practice using the new language they are learning, and you will encourage them to explore alternative strategies to solve problems.
7. Say the numbers 1 – 6 in sequence
8. Associate counting up with forward walking on a number line.

B. Grouping

1. Small Group

- C. Materials and Preparation
 - 1. Overhead Projector
 - 2. Four sets of cards for numbers 1 – 6
 - 3. 1 bag of playing chips (6 chips for each primary color) for each group
- Step-by-Step number line (Note: You may use a commercially produced number line mat or you can make one using masking tape on the floor or chalk for an outdoor setting.)
- D. Language of Instruction
 - 1. Teacher: count, how many, number, compare, further away, closer
 - 2. Student: any, equal, close, far, larger, largest, less than, more than, none, smaller, smallest
- G. Procedures/Activities (Number Worlds Program - 2000[®]Number Worlds Alliance, Inc., Durham, NH)
 - 1. Using the overhead projector, introduce the numbers 1 – 6 by placing a transparency of a number card on the projector. Have the children help count the number of a specified color of chips that correspond with the number on the card shown.
 - 2. Learning to associate the numbers in the counting sequence with position on a number line helps children realize that numbers coming later in the sequence are bigger and farther away from 1 than numbers that come earlier in the sequence.
 - 3. Select one child to be the pawn.
 - 4. Have the other children take turns directing the pawn to move forward or backward one space at a time along the line in response to requests made by the group.
 - 5. Before the child actually moves, have the children try to figure out which numbers the child will be standing on after performing the request.
 - 6. At various points during the activity, stop the game play and ask the children to try to figure out which number the child will be standing on after performing the request.
- F. Go A Little Further
 - 1. Once the children are comfortable counting up and down using the 1 – 6 sequences, increase the sequence to 1 – 10.
 - 2. Divide the children into two groups and assign each group to one of the Step-by-Step Number Lines.
 - 3. Select one child from each group to be the pawn.
 - 4. Have the other children in each group take turns directing the pawn to move forward or backward one space.
 - 5. Before the child actually moves, have the children try to figure out which number the child will be standing on after performing the request.
 - 6. At various points during the activity, stop the game play and ask the children to compare the position of the two pawns. Encourage the children to use numbers to describe and compare the relative positions of the two pawns. You might ask: “How far along is each pawn? Which pawn is farther along? Why do you think this is so? On which numbers are the

two pawns standing? What does this tell us about which pawn is farther along?

G. Assessment/Evaluation

1. Observation data of student responses to teacher question: the teacher may make informal notes or create a specific checklist to track the students' progress. CK PAT Assessments as follows:

Level I:

- 3KD-MR-D1 Recite the number sequence 1-4
- 3KD-MR-D5 Count groups of objects with up to 4 items per group
- 3KD-MR-D7 Name and match numerals 1-4 with corresponding quantities

Supplemental Level I:

- 3KD-MR-D1 Recite the number sequence 1-4
- 3KD-MR-D5 Count Groups of objects with up to 4 items per group

Level II:

- 4KD-MR-E01 Recite the number sequence 1-10
- 4KD-MR-E05 Count groups of objects with up to 6 objects per groups
- 4KD-MR-E07 Name and write numbers 1-6

Supplemental Level II:

- 4KD-MR-E03 Demonstrate one to one correspondence with concrete objects, up to 6 objects
- 4KD-MR-E04 Construct a collection of objects so that it has the same number of objects, up to 6 objects

Lesson Two: Gummi Bear Math

A. Daily Objectives

1. To help the children understand the concepts of numbers using familiar manipulatives.
2. To familiarize the children with the numbers 1 – 6.
3. The children will count to six out loud.
4. The children will identify the numbers 1 – 6.
5. The children will show the numbers 1 – 6 using manipulatives.

B. Grouping

1. Small Group

C. Materials & Preparation

1. *The Gummi Bear Counting Book* (Boeghold, Lindley 1999) Anness Publishing Inc.
2. A sandwich bag for each student in the class containing 10 gummi bears.
3. Cut outs in the shape of bears with the numbers 1 – 6 written on their stomachs. (Each student has a set)
4. Number cards for numbers 1 – 6

D. Language of Instruction

1. Teacher: classify, color, sort, the same as, count, how many, number, compare, pattern, and add.
2. Students: different, same, fewer than, less than, more than.

E. Procedures/Activities

1. Show the children a stuffed animal of a bear.
 2. Ask the student what animal you are holding.
 3. Discuss animals they own.
 4. Explain to the children that they will be learning something very special. They will practice to count using bears.
 5. Introduce the Book – *The Gummi Bear Counting Book*
 6. Read the story.
 7. Students will place the bear cut outs on corresponding number cards.
 8. After the story is read, as a class, review the bears on the number cards by having the children count out loud.
- F. Additional Activity:
1. Explain to the children that they will each be given a sandwich bag that contains 10 gummi bears.
 2. Tell the children not to eat the gummi bears until after the activity.
 3. Show the children the bear cut outs that they will receive and show how they each have a different number on them.
 4. Begin the activity by calling 1 – 6.
 5. Find the bear that has that number on its stomach and using gummi bears, show that number on the cut out.
 6. Have the bears already made displaying the correct number of gummi bears to use as an aid in checking the answers.
- G. Go A Little Further
1. Once the children are comfortable grouping the number of gummi bears to the corresponding numbers on the cut outs, they may group the bears by color.
 2. Once they have accomplished this part of the activity, the children can increase the sequence to 1 – 10.
- H. Assessment/Evaluation
1. Observation data of student responses to teacher questions. The teacher may make informal notes or create a specific checklist to track the students' progress. Using CK PAT assessments as listed for each level.
 - Level I:
 - 3KD-MR-D5 Count groups of objects with up to 4 items per group
 - 3KD-MR-D7 Name and match numerals 1-4 with corresponding quantities Supplemental Level I:
 - 3KD-MR-D6 Given an oral number, create a group with the correct number of objects, up to 4 objects per group
 - Level II:
 - 4KD-MR-E05 Count groups of objects with up to 6 objects per groups Supplemental Level II: 4KD-MR-E06 Given an oral number, create a group with the correct number of objects, up to 6 objects per group

Lesson Three: Musical Number Sequencing

- A. Daily Objectives
 1. Number recognition
 2. The children will learn to follow simple rules.
 3. While playing the game Musical Chairs, the children will learn to use their listening skills.
- B. Grouping
 1. Large or Small
- C. Materials & Preparation
 - Number cards made out of construction paper (1 – 6)
 - Masking Tape
 - Music
 - Tape Recorder
 - Edibles (fruit snacks, stickers, etc...)
 - Small pieces of paper with the numbers matching the number cards
 - Container for the small pieces of paper with the numbers on them
- D. Language of Instruction
 1. Teacher: count, number, compare, add, subtract, take away
 2. Students: number, all, different, same
- E. Procedures/Activities
 1. Make number cards out of construction paper.
 2. Write the numbers 1 - 6 on each paper.
 3. Tape the number cards to the floor in a square shape (laminating the number cards will help them last longer.)
 4. Make small pieces of paper with the numbers on them to match the number cards.
 5. Place the small pieces of paper with the numbers on them in a container.
 6. Each student will stand on a number.
 7. Start the music and while it is playing the children will walk around the numbers.
 8. Stop the music and draw a number out of the container.
 9. Call out the number you drew. The children have to look at the numbers they are standing on and determine if their number is the matching one. Whoever recognizes their number and gets it right will win a prize.
- F. Go A Little Further
 1. Repeat the activity, except this time use colors, shapes and the letters of the alphabet.
 2. Instead of the teacher drawing a number out of the container, let students do it and see if he/she can visually recognize the number.
- G. Assessment/Evaluation
 1. Observation data of student responses to teacher questions. The teacher may make informal notes or create a specific checklist to track students' progress.
 2. Continue CK PAT numbers from Lesson One.

Lesson Four: Introduce Shapes

- A. Daily Objectives:

1. The children will be able to classify & name the shapes, Circle, rectangle, Triangle, Square.
 2. Using their memory skills, the children will be able to recite the number sequence, 1 – 6.
 3. Focusing only on shapes, not colors, the children will be able to identify the shape that the teacher is holding up with the corresponding shape on their shape card.
 4. The children will learn to play the Color and Shape Bingo Game.
- B. Grouping
Small group
- C. Materials & Preparation
Four sets of cards for the different shapes used
Playing chips or tokens
Bingo card for each child with different color shapes introduced
Card stock shape cards (students use these)
Plastic attribute blocks (teacher uses these)
4 sets of card stock number cards with corresponding number of shapes
- D. Language of Instruction
1. Teacher: color, count, how many, number
Student: different, same, (different shapes introduced), numbers
1 – 6, colors introduced.
- E. Procedures/Activities:
1. Introduce shapes to the children using a “feely” bag. Fill a pillow case with attribute blocks of the 4 shapes in different sizes. Have each child reach in and chose one shape. They feel the shape to identify what shape it is. Ask questions to help the student identify. How many corners does it have?
 2. After the student has accurately identified the shape, have the student look around the room and find an object that is that shape.
After each child has identified all the shapes, play bingo game.
 3. The Bingo game can be played by 2 – 4 players. Explain to the children that you are going to play this game in a different way. They will have to *focus only on shapes, not colors*. As you draw the calling card, show and name the shape depicted & direct the children to check their card to see if it includes this shape. The children may cover any square of the same shape on their card with a token, *regardless of the color*
 4. Review numbers 1 – 6 using number cards with corresponding number of shapes. Each child will have a set of six number (shape) cards (1 – 6).
 5. Have the child put the correct number of the shapes (using plastic shapes) on the number card that it corresponds with. Have the child count the shapes out loud while placing them on the Card.
- F. Go A Little Further
Explain to the children that you are going to play the Color and Shape Bingo Game a different way than you have previously. This time as you

draw a calling card, show and name the color and shape depicted & direct the children to check their card to see if it includes a shape of this color. Children may only cover a square on their card with a token or playing chip, *if it matches both the color and shape of the calling card*. number cards and have the child place the correct color shape on the corresponding card.

G. Assessment/Evaluation

1. Observation data of student responses to teacher questions: the teacher may make informal notes or create a specific checklist to track students' progress. Use CK-PAT numbers as follow:

Level I:

3KD-MR-A1 Identify pairs of objects as same or different

3KD-MR-A2A Sort objects by color

Level II:

4KD-MR-A5 Identify & verbally label the difference criteria used for the classification of several groups of objects or pictures

4KD-MR-C2 Given a collection of assorted shapes, classify & name the circles, rectangles and triangles

Lesson Five: Pattern Recognition and Graphing Groups

A. Daily Objectives:

1. The children will be able to create and verbally describe a pattern.
2. Using a pattern recognition activity sheet, the children will be able to continue a pattern of shapes by different colored shapes.
3. The children will visually recognize different shapes and will be able to count each shape, fill a graph for each shape to the right height, and circle the shape that appears most often.

B. Grouping

Small group

C. Materials & Preparation

Pattern Recognition Activity Sheet

Graph Groups Activity Sheet

Plastic unifix cubes or teddy bear counters

D. Language of Instruction

1. Teacher: color, the same as, count, how many, number, compare, add, in order, shape, pattern, continue the pattern, extend the pattern,
Student: different, same, fewer than, more than, shapes introduced.

E. Procedures/Activities

The children will make an AB pattern using two colors with the unifix cubes. Start with ABAB, AABBAABB, BBABBA, etc.

1. When the children have accomplished this activity, they will make a pattern using different shapes.
2. Once the children are comfortable creating different patterns, they may be given the Pattern Recognition Activity Sheet.

3. The children will draw the shape that comes next.
 4. Once the children have accomplished this activity, they will be prepared for the graphing activity on another day.
 5. The children will count each shape, fill the graph for each shape to the right height and they will circle the shape that appears most often.
- F. Go A Little Further
1. Explain to the children that they will make a pattern using the teddy bear counters. They will make a pattern using two different colors and two different sizes. (Example: Big blue bear, small red bear, big blue bear, small red bear, etc...)
 2. The children will create a pattern using two different shapes and two different colors. (Example: Blue square, red rectangle, blue square, red rectangle, etc...)
- G. Assessment/Evaluation
1. Observation data of student responses to teacher questions: the teacher may make informal notes or create a specific checklist to track students' progress. Use CK PAT numbers as follows:
 Level I:
 3KD-MR-B3 Continue a given pattern of 5 objects, representing actual objects or a pattern card, in which one property is alternated.
 Level II:
 4KD-MR-B3 Create and verbally describe a pattern of concrete objects.

Lesson Six: M&M Color Chart Graphing

- A. Daily Objectives:
1. Familiarize the children with numbers 1 – 6
 2. To help the children understand the concept of numbers using familiar manipulatives.
 3. To count 1 – 6 out loud.
 4. To identify the numbers 1 – 6
 5. To identify the colors introduced.
 6. To identify the greatest number to the smallest.
- B. Grouping
Small or Large
- C. Materials & Preparation
Large piece of butcher paper to make a graph to display the favorite color of M&M.
M&M Color Chart. (This can be a teacher made graph with the colors written at the bottom of the graph and the numbers 1 – 6 written on the right hand side of the graph.)
- D. Language of Instruction
1. Teacher: classify, color, sort, the same as, count, how many, number, compare, add, put together, pattern, least, least favorite, more than
 2. Student: different, same, fewer than, less than, none, some, long (er) (est), short (er) (est)
- E. Procedures/Activities

1. Give a handful of M&Ms to each child. Remind them not to eat them until after the activity.
 2. Have the children put the colored M&M on the correct spot on the graph.
 3. Have the children count how many M&Ms of each color they have.
 4. After the children have counted and graphed, have them eat the M&Ms one at a time and ask them what their favorite color is.
 5. Make the chart showing the favorite color.
 6. Answer the questions What's the favorite color? What is the least favorite color?
 7. List the favorite color from greatest to smallest.
- F. A Little Further
1. After the children are comfortable graphing their M&Ms they may color the square on the graph that has the M&M on it before they remove the M&M.
 2. After they have finished coloring the corresponding squares on the graph, the children can sort the M&Ms by color.
 3. You can make another chart showing how many of each color.
 4. Answer the questions What color has the most M&Ms? What color has the least M&M? Longest line? Shortest line? Greater than? Less than?
- G. Assessment/Evaluation
1. Observation data of student responses to teacher questions: the teacher may make informal notes or create a specific checklist to track students' progress. Use CK PAT numbers as follows:
 Level I:
 3KD-MR-A2A Sort objects by color
 Supplemental Level I
 3KD-MR-E1 Compare sets of numerals 1-4 to determine more or less, greater than or less than
 Level II:
 4KD-MR-E01 Recite the number sequence, 1-10
 Level II Supplemental:
 4KD-MR-E02 Compare two groups of no more than 6 objects/group & use quantitative vocabulary to describe the groups
 4KD-MR-E10 Organize and read quantitative data on a simple bar graph

VII. CULMINATING ACTIVITY

A All activities become something that is incorporated into a math center where any student during the plan, do, review may choose to go to the math center and continue reinforcing the particular math skills they need to work on.

VIII. HANDOUTS/WORKSHEETS

- A. Number Cards
- B. Bingo Cards
- C. Pattern Recognition Activity Sheet

D. Graphing Groups Activity Sheet

IX. BIBLIOGRAPHY

- A. *Core Knowledge Preschool Sequence*. Charlottesville, VA: Core Knowledge Foundation.
- B. Griffin, S. *Number Worlds Program Manual: Preschool Level*. Durham, NH: Number Worlds Alliance, Inc., 2000.
- C. www.sitesforteachers.com