Developing Number Sense in the Preschool Classroom: A Sneak Peek at the Number Worlds Program

Grade Level: Preschool
Presented by: Holly Dolan-Rourke
Length of Unit: On going classroom practices

I. ABSTRACT
The learning activities in the *Number Worlds Math Program, Preschool Level* (Griffin, 2000) were designed based on the premise that children come to school with well-established intuitive mathematical understandings. The sequence of activities in the program provides support for children as they continue to construct these understandings. Appropriate for different developmental levels, children actively engage in their own learning in a collaborative and language rich environment. The activities for this presentation also highlight the diverse representation of quantity, or the different ‘Number Worlds’, that is a core element of instruction. The Number Worlds Program represents a significant portion of the curriculum for the Core Knowledge Mathematics Preschool Sequence.

II. OVERVIEW
A. *Core Knowledge Preschool Sequence* content
   1. Sort and classify objects: sort by color
   2. Quantify groups of objects: count groups of objects, compare groups of objects (more and less), recite number sequence, recognize numerals, organize and read quantitative data in a graph
   3. Develop understanding of addition and subtraction: illustrate concept of ‘take away’
   4. Use simple measurement skills: compare length of objects (longer or shorter)

III. BACKGROUND KNOWLEDGE
A. *Core Knowledge Preschool Sequence*. Charlottesville, VA: Core Knowledge Foundation.

IV. PREREQUISITE PRIOR KNOWLEDGE FOR STUDENTS
A. Developing counting skills
B. Developing skills for quantifying concrete objects
C. Developing numeral recognition skills
D. Developing understanding of ‘putting together’ and ‘taking away’

V. RESOURCES
A. Materials
   1. Sorting chips (mixture of red, yellow, green, blue)
   2. Color sorting mats
   3. Large, wide mouth containers
   4. Bowls
   5. Dice
   6. Paper clips
7. Rubber bands
8. Pawns
9. Beads
10. Small cloth (such as a bandana)
11. Step-by-step number line
12. Crayons
13. Graph record sheets
14. Classroom dial

B. Commercial Educational Resource List
1. Delta Education, PO Box 3000, Nashua, NH 03061-3000
   1-800-442-5444
   www.delta-education.com
2. Nasco (step-by-step number line)
   www.enasco.com
3. ETA, 500 Greenview Court, Vernon Hills, IL 60061-1862
   1-800-445-5985
   www.etauniverse.com

VI. LESSONS OUTLINE

Lesson one: Color Sorting Mat (Object Land)
A. Daily Objectives
   1. Match colored playing chips with colored sections of Sorting Mat
   2. Count out a specified quantity of a specified color from a larger set
   3. Compare sets of objects to identify which have more, less or the same amount
   4. Gain cooperative learning experience
B. Grouping
   Small group (4-8 students)
C. Materials & Preparation
   1 Color Sorting Mat for each group of 4 children (2 groups can play at once)
   1 bag playing chips (10 chips of each primary color) for each group
   1 bowl (or other large container) with playing chips for each group of children
D. Language of Instruction
   1. Teacher: How many? How many altogether? How do you know?
   2. Students: red, yellow, green, blue, one, two, three, four, rectangle, many,
      altogether, most, fewest, same amount, first, second, third, fourth
E. Procedures/Activities
   1. Give each group of children a sorting mat and a bowl of playing chips. Review
      the primary colors by touching each rectangle of the sorting mat in turn and
      asking children to name the color. Repeat by holding up one playing chip of
      each color in turn.
   2. Tell children that they will take turns following directions and decide who will
      go first, second, third and fourth in each group.
   3. Ask the first child to get one red chip and place it on the red rectangle. Ask the
      second child to get one blue chip and place it on the blue rectangle. Repeat for
      the remaining colors with the remaining children. Discuss how many chips are
      on each rectangle and how many are on each mat altogether.
   4. Repeat activity asking children to place two chips of each color on each
      rectangle, then three chips, then four chips. Periodically ask children, “How
      many red (blue, yellow, green) chips do we have on our mat?
F. Go A Little Further
1. Repeat activity, except this time, ask children to place different quantities of chips on each colored rectangle (e.g. one red chip on the red rectangle, two blue chips on the blue rectangle, three green chips on the green rectangle).
2. When all chips have been placed, ask children to discuss and compare the quantities shown. You might ask: “How many chips are on the blue (or the red, green, yellow) rectangle? Which rectangle has the most chips? Which rectangle has the fewest chips? Do any rectangles have the same amount of chips? How do you know?”

G. Assessment/Evaluation
1. Observation data of student responses to teacher questions. Teacher may make informal notes or create a specific checklist to track students’ progress.
2. Periodic use of the *Number Knowledge Test* (fall, winter, spring) to assess students’ overall development.

Lesson Two: A Dice and Sorting Mat Game (Object Land)

A. Daily Objectives
1. Match colored playing chips with colored sections of Sorting Mat
2. Count out a specified quantity of a specified color from a larger set
3. Compare sets of objects to identify which have more, less or the same amount
4. Gain cooperative learning experience

B. Grouping
Small group (2-4 players)

C. Materials & Preparation
1 Color Sorting Mat
1 dot set die
1 bag of playing chips (40 chips, 10 of each color) for the Banker
1 small bowl or paper cup for each player to store his/her game “keep” pile

D. Language of Instruction
1. Teacher: When the supply of Banker’s chips is running low, you might ask: How many blue (red, green, yellow) chips are left? What color do you hope to land on? What number do you hope to roll? Why would that color (or that number) be a good color (or number) to get?
2. Student: red, yellow, green, blue, one, two, three, four, rectangle, many, altogether, most, fewest, same amount, first, second, third, fourth

E. Procedures/Activities
1. This game can be played by 2-4 players. One player, or the teacher, can be designated to play the role of Banker. Players can roll the die to determine who will go first.
2. The first player rolls the die onto the sorting mat.
3. Next, the player is to identify the color of the rectangle the die landed on (e.g. blue) and the quantity shown on the die (e.g. 4).
4. The player then asks the Banker for the quantity of chips shown on the die in the color indicated by the die’s location (e.g. “I need 4 blue chips”). All players should watch to determine if the correct number and color are requested.
5. If the player asks for the correct color and quantity, the Banker will give him or her the chips asked for and the player can store them in his/her “keep” pile. If a mistake is made in the number or color asked for, the player earns nothing for that round.
6. When the Banker’s supply of chips runs low, players must roll a quantity that is equal to or less than the number of chips remaining (e.g. if there are only 3 blue
chips remaining and a player rolls a 4 onto the blue rectangle, that player would not get any chips).

7. When all of the chips in each color are gone, the game is over. Children can count the chips they have earned—in their keep pile—to determine who is first winner, second winner, etc.

F. Go a Little Further
Teacher may replace the dot set die with a numeral die to challenge students who have already developed numeral recognition and a solid understanding of dot set patterns.

G. Assessment/Evaluation
1. Observation data of student responses to teacher questions: teacher may make informal notes or create a specific checklist to track students’ progress.
2. Periodic use of the Number Knowledge Test (fall, winter, spring) to assess students’ overall development.

Lesson Three: Let’s Compare (Object Land)

A. Daily Objectives
1. Compare sets of objects to identify which is longer or shorter, bigger or smaller
2. Compare sets of objects to predict which is longer when a visual basis for this judgment is not present
3. Compare sets of objects and sequence them by size when the visual basis for these judgments presents conflicting cues

B. Grouping
Small group (4-6 students)

C. Materials & Preparation
3-7 playing chips for each child
paper clip chains varying in length from 3-7 paper clips
3-9 rubber bands for each child, so each child has a different number
10 playing chips
6 dice
7 pawns
8 beads
9 paper clips

D. Language of Instruction
1. Teacher: count, how many, number, compare
2. Students: all, any, equal, fewer than, larger, largest, less than, more than, none, smaller, smallest, some

E. Procedures/Activities
1. The “Let’s Compare” activities give children many opportunities to compare sets of objects arranged in a variety of ways. In these activities, the visual and spatial cues that young children use to make quantity comparisons are gradually withdrawn. Leading children to the understanding that counting is a more precise and reliable way to assess relative magnitude when other cues are available and is the only way when other cues are unavailable.

2. Activity 1: Place a horizontal row of playing chips in front of each child, with quantities varying from three to seven chips. Make sure that each child has a different number of chips.

3. Ask the group to determine who has the longest row and who has the shortest row. Have children explain how they know. Guide the discussion so the children recognize that the longest row has seven chips, the shortest row has three chips, and seven is bigger than, or more than, three. You might ask, “How do you know this row is bigger? What about the chips tells us that this row is
bigger?” or “What makes this row short? How many chips does it have? How does that compare to the other row?”

4. Next, select pairs of children with sets of different sizes (such as five and six) and repeat the questions. Continue until all possible combinations of set sizes have been compared.

5. When the children are ready for a challenge, use different colors of playing chips to provide conflicting cues. This will encourage children to rely more on numbers to figure it out.

6. **Activity 2:** Tell the children they will compare two paper clip chains to decide which one is longer. Show the children two paper clip chains, one with three paper clips, and one with five, displayed so as to minimize the obvious difference.

7. Ask the children which chain is longer. Allow discussion, encouraging the children to explain why they think one chain is longer.

8. Present the chains dropped on the table in heaps, so that size is even harder to differentiate. Again, ask children which is the longer chain. Allow discussion, encouraging the children to explain why they think the chain is longer. If the children suggest stretching out the chains to compare their length, ask them to try to think of another way to determine which chain is longer.

9. If no one mentions counting the clips, point out that the paper clips can be counted to determine which chain has more paper clips, and therefore is longer. Repeat this task with paper clip chains of different lengths.

10. **Activity 3:** Because the visible amount in each group may be deceiving, this activity really encourages children to rely on using numbers to decide which of two groups is bigger.

11. Divide the children into pairs. Place an overlapping set of rubber bands (varying from three to nine) in front of each child. Make sure that each partner has a different number of rubber bands.

12. Ask the children to decide who has the most rubber bands. Ask the children to explain how they know. You might ask, “Can you tell just by looking? What’s another way to figure it out?”

13. Repeat the procedure with different pairs of children, varying the number of rubber bands you give to each pair.

14. **Activity 4:** Tell the children that they are going to arrange groups of objects from the group with the least to the group with the most. Place the materials on a table so that the materials are arranged in groups.

15. Have the children count each set. Ask the children which group has the most and which has the least.

16. Have the children place the smallest group on the left and the largest group on the right.

17. Finally, ask the children to place the remaining groups between the group with the least and the group with the most.

18. Children may find it more challenging to arrange items of various sizes. When the children are ready for a challenge, replace some of the items with larger materials. Try the procedure outlined above using a variety of supplies, such as books, beads, blocks, dolls, or paper clips.

F. **Go A Little Further**

1. Note that the activities described above contain some suggestions for challenges.

2. The four activities may be used simultaneously with children of different abilities. For example, children who easily master Activity 1 may quickly go onto Activities 2 and 3. Children who are struggling with the concepts in
Activity 1 should stay with this activity until they are comfortable with the work.

G. Assessment/Evaluation
   1. Observation data of student responses to teacher questions: teacher may make informal notes or create a specific checklist to track students’ progress.
   2. Periodic use of the Number Knowledge Test (fall, winter, spring) to assess students’ overall development.

Lesson Four: The Mouse in the Cookie Jar (Object Land)

A. Daily Objectives
   1. Count a set of objects and identify how many there are
   2. Compare sets of objects
   3. Recognize that when one object is taken away, the size of the set is reduced by one

B. Grouping
   Small group

C. Materials & Preparation
   5 playing chips for each child, each child needs a different color
   1 wide-mouth container such as a coffee can, to be used as the cookie jar
   Small cloth, such as a bandana

D. Language of Instruction
   1. Teacher: count, how many, number, compare
   2. Students: all, any, equal, fewer than, larger, largest, less than, more than, none, smaller, smallest, some

E. Procedures/Activities
   1. Tell the children to pretend it is the night before a school party. Each child is supposed to make 5 cookies and put them in the cookie jar so that they can bring them to the party the next day.
   2. Distribute sets of 5 playing chips to the children so that each child has all the chips of one color.
   3. Have the children count their chips to make sure they each have five chips.
   4. Have the children put their chips into the container. Remind the children that the container is the cookie jar and the playing chips are cookies.
   5. Ask the children if they remember what color and how many chips they put in. If someone cannot remember, empty the can so the children can recount their cookies.
   6. Tell the children that a little mouse is going to come while they are sleeping and sneak one of the cookies out of the cookie jar.
   7. Have the children close their eyes and pretend to sleep. Explain that you are going to be the mouse. While the children have their eyes closed, sneak one of the chips out of the container and hide it in the cloth.
   8. Tell the children, “Wake up! A mouse has been in the cookie jar.”
   9. The children will have to figure out whose cookie the mouse took, so he or she can ask the mouse to give the cookie back.
   10. Ask the children for ideas about how to figure out whose cookie the mouse took, and allow plenty of time for the children to discuss the problem.
   11. If no one suggests emptying the cookie jar and counting all the chips, suggest it as a possibility.
   12. Empty the cookie jar onto the table and have the children retrieve and count their own chips to determine which color set is missing one.
13. When a child claims that the mouse took his or her chip, ask the child to explain how he or she knows. Encourage children to use numbers in their explanations. A child might say, “Because I had 5 and now I only have 4, so 1 is missing.”

14. Once a determination is made and verified, and all the children are satisfied that it is accurate, ask the children to predict whose cookie the mouse took. Have the child ask for his or her chip back. The mouse should reveal the cookie to confirm.

15. After several rounds, invite volunteers to be the mouse. Remind the children that the mouse can take only one cookie.

F. Go A Little Further
1. For children who have difficulty counting a group of 5 objects reliably, you might want to use 3 playing chips instead of 5 for the first several rounds of game play.
2. Once the children are comfortable with the stated level of play, make the game more challenging by increasing quantities of chips (up to 10) and by having the mouse remove two cookies from the cookie jar.

G. Assessment/Evaluation
1. Observation data of student responses to teacher questions: teacher may make informal notes or create a specific checklist to track students’ progress.
2. Periodic use of the Number Knowledge Test (fall, winter, spring) to assess students’ overall development.

Lesson Five: Catch the Teacher (Picture Land)
A. Daily Objectives
   Detect an error in counting and identify which number was omitted from the sequence
   Use tally marks to represent and compare quantities

B. Grouping
   Whole group

C. Materials & Preparation
   Two columns on a chalkboard, one marked ‘Students,’ the other marked ‘Teacher’ to be used to keep tally mark scores

D. Language of Instruction
   1. Teacher: count, how many, number, compare
   2. Students: all, any, equal, fewer than, larger, largest, less than, more than, none, smaller, smallest, some

E. Procedures/Activities
   1. Tell the children that to play today’s game, they should listen very carefully to see if they can catch you making a counting mistake. Explain the rules of the game.
   2. The children should listen carefully while you count, and they should raise their hands if they hear you make a mistake.
   3. The students will get one point if the child who raises his or her hand can tell you which number you left out.
   4. The teacher will get one point if no one catches your mistake, or if the child who is called on cannot say which number was omitted.
   5. When the children understand the rules, remind them to listen carefully to make sure that you say all of the numbers and do not leave any out. Then begin the game.
   6. Count to 5, leaving out the number 4.
7. If the children do not catch your mistake, tell them to listen very carefully to see if they can catch you leaving out a number. Count to 5 again, leaving out the number 4.
8. If the children raise their hands while you are counting, stop counting and ask the child with the raised hand which number you left out.
9. If a child who is called on cannot remember the number, which was omitted, call on someone else whose hand is raised. If the child says a wrong number, ask the other children if they agree with the child’s choice. If they do not agree, ask another child what number was omitted. Then confirm this child’s answer by asking, “Do you all agree that I forgot to say the number 4?”
10. Award one tally point to the Students if they correctly tell you which number you left out.
11. Award one tally point to the Teacher if they do not catch your mistake.
12. Repeat the procedure, counting from 1 to 5, sometimes leaving out different numbers and other times counting correctly.
13. At the end of the game ask the children to look at the tally marks in each column to try to figure out who won. Make sure the children understand whose scoring column is whose. Give several children a chance to provide an answer and say how they figured it out. If the children do not suggest counting the tally marks in each column to see who has the most marks, suggest it as a strategy.

F. Go A Little Further
1. When the children are ready, repeat the procedure counting up to 10, up to 15, and up to 20. This is a good activity to revisit and adjust several different days as the children’s abilities grow.
2. Play ‘Catch the Teacher Backwards’. Use the above procedure but count backwards. Start with 5 and then gradually work up to 10, 15, and 20 as the students’ abilities progress.

G. Assessment/Evaluation
1. Observation data of student responses to teacher questions: teacher may make informal notes or create a specific checklist to track students’ progress.
2. Periodic use of the Number Knowledge Test (fall, winter, spring) to assess students’ overall development.

Lesson Six: Step-by-Step Number Line (Line Land)
A. Daily Objectives
Learn the position of each number in the 1-10 sequence
Associate moving forward on a number line with the next number up in a sequence and moving backward with the next number down
Associate position on a number line with distance traveled towards a goal
Compare positions on the number line to identify who has traveled a farther or shorter distance towards a goal (challenge activity)

B. Grouping
Whole group

C. Materials & Preparation
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 to
2. Students: any, equal, close, far, larger, largest, less than, more than, none, smaller, smallest
E. Procedures/Activities
1. Learning to associate numbers in the counting sequence with position on a number line helps children realize that numbers that come later in the sequence are bigger and farther away from 1 than numbers that come earlier in the sequence.
2. Tell the children they are going to play the Step-by-Step Number Line, in which one child at a time will act as a pawn, moving forward or backward one space at a time along the line in response to requests made by the group.
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.
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 game play and ask the children to describe the position of the pawn, encouraging the children to use numbers in their descriptions. You might ask, “How far along is the pawn? On which number is the pawn standing? What does this tell us about how far along the line he or she is?”

F. Go A Little Further
1. For children who need to work on a smaller set size, fold the number line under at 5 and use only the numbers up to 5. (Similarly, if you are constructing the number line, only go as far as 5.)
2. Use two Step-by-Step Number Lines for a challenge.
3. Tell the children that they are going to play the game with two children at a time acting as pawns, moving forward or backward one space at a time along the line in response to requests made by the group.
4. Divide the class into two groups and assign each group to one of the number lines. Select one child from each group to be the pawn.
5. Have the other children in each group take turns directing the pawn to move forward or backward one space.
6. Before the child actually moves, have the children try to figure out which number the child will be standing on after performing the request.
7. At various points during the activity, stop 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 questions: teacher may make informal notes or create a specific checklist to track students’ progress.
2. Periodic use of the Number Knowledge Test (fall, winter, spring) to assess students’ overall development.

Lesson Seven: Drop the Playing Chip (Sky Land)
A. Daily Objectives
   Count a set of objects and identify how many there are
   Record quantity as units on a bar graph
   Associate increasing quantity with increasing the height of a scale measure
   Use graph recordings to compare quantities
B. Grouping
Whole group (may also be adapted to use in small group setting)

C. Materials & Preparation
- 5 playing chips for each group
- 1 record sheet for each child (two column bar graph, one with a symbol for ‘chips in’ the container and one with a symbol for ‘chips out’ of the container)
- Large, wide-mouthed container, such as a coffee can for each group
- 1 crayon for each child
- Chair for each group

D. Language of Instruction
1. Teacher: count, how many, number, compare
2. Students: all, any, equal, fewer than, larger, largest, less than, more than, none, smaller, smallest, some, taller, tallest, shorter, shortest

E. Procedures/Activities
1. Representing objects in a bar graph will show children the relationship between a set size and scale height. It will also lay a foundation for understanding charts and graphs when these topics are introduced more formally at higher grades.
2. This activity works well when the whole class, divided into groups, plays at the same time. Tell the children that, in each group, one child at a time will drop playing chips aiming for the container, and another child will record how many chips fall into the container and how many fall onto the floor, while the rest of the group watches to make sure the children drop and record correctly.
3. Distribute one chair and one container to each group, and to each child distribute one record sheet and one crayon, making sure that each child in the group has a different color.
4. Have the children write their names on their record sheets. Explain to the children how to use the record sheet, modeling the procedure for the children as you explain it.
5. After dropping the chips, the children will start with the square above the ‘chips in’ column and color in as many squares up as chips fall into the container.
6. The children will start with the square above the ‘chips out’ graphic and color in as many squares up as chips fall onto the floor.
7. Help the children determine the order of play for chip dropping and recording. One suggestion is to have children pair up. One person drops, the other records and then the two switch roles.
8. Have the first child kneel on the seat of a sturdy chair so that the child is facing the chair back. Place the container on the floor beneath and slightly in front of the kneeling child.
9. Tell the child to keep his or her arm straight out and level with the top of the chair back while dropping the chips one at a time into the container.
10. Have the rest of the children count out loud as each chip is dropped.
11. After all the chips have been dropped, have the recorder fill in the record form to shop how many chips fell into the container and the number of chips that fell onto the floor.
12. Have the children take turns dropping and recording.
13. Ask the children questions, which require them to count and compare their and their group mates’ record forms. For example, “How many chips did you drop onto the floor? Who dropped the most/least number of chips into the container?”

F. Go A Little Further
1. Gradually increase the number of chips used up to 10. This is an activity that you can revisit on different days using higher quantities as the children progress.
2. Have the children play multiple rounds that require them to add to their bar graphs. For example, if a child drops 3 chips in and 2 chips out on the first round and 4 chips in and 1 chip out on the second, the graph should show 7 chips in and 3 chips out altogether.

3. For children who need additional support, play the game as a small group where everyone records a cumulative number of chips in and out. For example, if 4 students play, each could drop two chips. Recording would take place after everyone had gone. The bar graphs would reflect the results of 8 chips dropped (e.g. 6 chips in and 2 chips out). The teacher would direct the record keeping; each child’s graph would look the same.

G. Assessment/Evaluation
1. Observation data of student responses to teacher questions: teacher may make informal notes or create a specific checklist to track students’ progress.
2. Completed bar graphs
3. Periodic use of the Number Knowledge Test (fall, winter, spring) to assess students’ overall development.

Lesson Eight: Count Up/Count Down (Circle Land)
A. Daily Objectives
1. Count up from 1-5 and from 1-9
2. Associate counting up with movement around a dial
3. Count down from 5 to 0 and from 9-0
4. Associate counting down with moving back on a dial

B. Grouping
Whole group

C. Materials & Preparation
Classroom dial

D. Language of Instruction
1. Teacher: count, number
2. Students: zero, one, two, three, four, five, six, seven, eight, nine

E. Procedures/Activities
1. Watching a hand move around a dial while counting up or down helps children see that numbers can be used for measurement as well as for counting. It also helps them see that the hand on the dial moves farther around (or back) as each successive number up (or down) is said, laying a foundation for addition or subtraction.

2. Count Up: Have the children practice counting from 1-5. Sit in a semicircle with the children. Tell them that they are going to see who can count all the way from 1 to 5 while moving the hand on the classroom dial to match each number counted.

3. Review the number sequence 1-5 with the children. Model counting up to 5 for the children, and then have the children say the numbers with you while you say the sequence again and move the hand on the classroom dial to correspond with each number counted.

4. After everyone has counted together, invite volunteers to count and move the hand on the classroom dial to correspond with each number that they count.

5. While an individual child is counting, the rest of the children should listen and watch to make sure the child says all the numbers in sequence and moves the hand of the dial correctly with each number counted.

6. If a child hesitates, allow some wait time to give the child time to think.
7. If you think a child is unable to say the next number, ask the child if he or she is still trying to figure it out.
8. If the child needs help, either ask the other children to say the next number or prompt the child.
9. **Count Down:** Follow the same sequence for counting up (above) replacing the number sequence 1-5 with 5-1. It is fun to add in a ‘spaceship’ theme and allow the children to jump up and yell, “Blastoff!” when they finish.
10. **Note:** It is your decision whether or not to include ‘zero’ in this count down sequence. Children do not usually include ‘zero’ in their counting up, but often want to when they are counting down to ‘blastoff’.

**F. Go A Little Further**

1. Once the children are comfortable counting up and down using the 1-5 sequence, increase the sequence to 1-9.
2. The dial may also be used to ‘name the number’. Give the children a number and ask a volunteer to position the pointer at the given number. You may also introduce question such as, “I’m looking for the number that comes right after 3.” Children can take turns positioning the pointer using these clues.

**G. Assessment/Evaluation**

1. Observation data of student responses to teacher questions: teacher may make informal notes or create a specific checklist to track students’ progress.
2. Periodic use of the *Number Knowledge Test* (fall, winter, spring) to assess students’ overall development.

** VII. HANDOUTS/STUDENT WORKSHEETS**

A. Appendix A, directions for making color sorting mats and classroom dial
B. Appendix B, Drop & Count graph

** VIII. BIBLIOGRAPHY**

A. *Core Knowledge Preschool Sequence*. Charlottesville, VA: Core Knowledge Foundation.

Appendix A

**Color Sorting Mat**

**Materials:** red, yellow, green, blue construction paper, heavy cardstock or oak tag, scissors, glue, laminate (optional)

**Directions:**
1. Cut oak tag to 13”x 11” rectangle.
2. From the construction paper, cut four small rectangles to 5 ½ “ x 6 ½”, one of each color.
3. Glue rectangles onto oak tag in a 2-row/2-column line-up. (Color position does not matter here, use your own judgment.)
4. For greater durability, laminate sorting mat.

**Classroom Dial**

**Materials:** paper plate (or heavy stock paper cut into a circle), brass brad, black marker, black construction paper, ruler, pencil, scissors

**Directions:**
1. This looks like a clock.
2. With ruler and pencil, make dividing lines on the paper plate (or circle) so that there are 10 equal sections. (This should look like an evenly sectioned pie graph.)
3. Starting at the top section, pencil in one numeral for each section beginning with zero (0) and ending with nine (9).
4. Make a pointer for the dial using the black construction paper. (Think in terms of one hand of a clock.)
5. Fasten the pointer to the center of the circle with the brass brad.
6. Once you are happy with the length of the pointer and the size of the numerals, use the black marker to go back and darken the dividing lines between the sections and the numerals.
7. Hint: If your pointer begins to slip around the dial when you are holding it up for the children to see, cut a small circle of felt with a slit half way through to the center and slide it around the legs of the fastener at the back of the dial. This should provide enough friction to keep the pointer stationary while you are holding the dial upright.