College- and Career-Readiness Standards for Mathematics

Exemplar Lesson Plan

“Fun with Cardinality”

K.CC.4
K.CC.5
K.CC.6
Carey M. Wright, Ed.D., State Superintendent of Education

**Office of the Chief Academic Officer**
Kim S. Benton, Ed.D., Chief Academic Officer

**Office of Professional Development**
Trecina Green, Executive Director
Carol Ladner, Professional Development Coordinator
Elizabeth Fulmer, Professional Development Coordinator

**Office of Secondary Education**
Jean Massey, Executive Director
Marla Davis, Ph.D., NBCT, Bureau Director

**Office of Elementary Education and Reading**
Nathan Oakley, Executive Director
GRADE: Kindergarten

Title: Fun with Cardinality!

Estimated Duration: 3 days

Real World Purpose:
Learning to count in sequence and understanding cardinality is a skill that each person uses in everyday life. In order to be successful mathematical thinkers, students must have good number sense.

I Can:

K. CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality.
   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
   c. Understand that each successive number name refers to a quantity that one is larger.

K.CC.5: Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

K.CC.6: Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

Prerequisite Skills: Mathematics Standards (Four year old children)
https://districtaccess.mde.k12.ms.us/curriculumandInstruction/EarlyChildhood/4-year-old-standards.pdf
   • With prompting and support, recite numbers 1 to 30 in the correct order.
   • With prompting and support, recognize, name, and attempt writing numerals 1-10.
   • With guidance and support, understand the relationship between numerals and quantities.
   • Recognize that a numeral is a symbol that represents a number of objects, using developmentally appropriate pre-kindergarten materials.
• Match quantities and numerals 0-5.
• Count many kinds of concrete objects and actions up to 10, using one-to-one correspondence; and, with guidance and support, count up to 7 things in a scattered design.
• Use the number name to represent the number of objects in a set, using developmentally appropriate pre-kindergarten materials.

**Materials/Resources:**

- linking cubes
- ten frame blank cards
- color tiles
- Ziploc bags
- number cards
- [Ten Flashing Fireflies](#) by Philemon Sturges
- circle counters
- dot cards
- foam dice
- small cups/tubs
- index cards
- string/yarn
- **Attachments (Total: 6)**

**Key Vocabulary** (* = words defined in the MS CCR Mathematics)

- count
- counting on*
- set
- sequence
- tens
- one
- more
- less
- numeral
- greater than
- less than
- equal
- number words (zero - twenty)
- number line diagram*
- cardinality

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**Lesson Introduction**

**Student Exploration Activity:**

Prior to beginning this unit, the teacher will set up 4 to 5 centers for students to explore the manipulatives that will be used throughout the lessons. Each center will be identical in that it will include dice, linking cubes, counters, ten frame cards, tiles, number cards and dot cards. Allow students in groups of 4 to spend a few minutes exploring these items. The teacher will listen as groups discuss manipulatives to pre-assess student levels in regards to counting, cardinality and subitizing (the ability to instantly see how many). Have each student group share out things they observe or notice about the manipulatives. The teacher will guide the conversation so that students recognize and/or state the correct name for each manipulative.
**Lesson Activities**

**Day 1**

1. The teacher will pass out ten frames and counters to students. The teacher will read the book *Ten Flashing Fireflies* aloud to the class. Students will add one counter to the ten frame each time a firefly is added to the jar. Pause during the reading to allow the students to count the total number of counters on the ten frame. Then have students remove one counter each time a firefly flies away.

2. The teacher will arrange cubes (quantities from 0-10) in a line and have students place the corresponding number of counters on their ten frame. Then show the numeral and number word.

3. The teacher will continue to call out numbers (0-10) in random order until each number has been represented on the ten frame.

4. The teacher will have the students set aside the ten frame and display a number (0-10). The students will display the corresponding number of counters on their desks. Have students count aloud the number of counters and discuss the meaning of the last number they say when counting.

5. The teacher will continue to display a few more numbers allowing the students to set aside that many counters. The teacher will call on students that have counters arranged in various arrangements (line, circle or array). Share the various arrangements and ensure that students understand that the position or arrangement of the counters does not change the number. Model this for the students.
6. The teacher will display a number 0-10 and ask the students to display the corresponding number of counters. Then ask the students to add one more counter. The teacher will ask, “How many?” and allow the students to respond. Repeat the procedure and observe student responses. Note students that need additional intervention.

7. The students will set aside the ten frames and counters and work with a partner to draw or illustrate numbers from 0-10. Students may use pictures, numbers or words in their work.

**Day 2**

1. The teacher will pass out 2 ten frames and 20 counters for students to work in pairs. The teacher will discuss using 2 ten frames instead of just 1. Display a number 0-10 and let students put the number of corresponding counters on the ten frames. Repeat the process for numbers 11-20 displaying the number in random order.

2. Play Fill the Frames (Attachment #1) with the whole group. Each student will have a copy of Fill the Frames. The teacher will roll one die (or two dice) and instruct the students to place the corresponding number of counters on the ten frame. The teacher will continue the procedure until students have filled up most of the spaces on the ten frames. Students may be allowed to play this game in pairs if additional practice is deemed necessary. *Note: Ten Frames may also be purchased from www.EAIEducation.com for long-term use.*
3. The teacher will instruct the students to set aside the ten frames and counters get paper and pencil for this activity. Introduce the vocabulary words “more” and “less” to the students and display the words in the classroom. The teacher will display a number card 0-20 for the entire class. The teacher will ask students to write a number on their paper that is “more” than the displayed number. Repeat the same procedure and ask the students to write a number that is “less” than the displayed number. The teacher will share written student responses and allow students to explain their thinking and prove their answers. The teacher will continue to ask more complex questions such as, “Can you name a number that is less than 7 but more than 3?” The students may use counters in proving their answers. The teacher will guide the discussion and begin to use the terms “greater than” and “less than” in sharing the student responses. Observe student understanding and note those needing intervention.

4. The students will work in pairs to play Get to 20! (Attachment #2) while the teacher assesses students individually. The teacher will use the Dot Cards and Number Cards 11-20 (Attachment #3) to assess each student individually. Students will match the dot card with the correct number. The teacher will randomly ask students to show a number card that is greater than or less than another number. Note the counting strategies of each student (example: counts dots individually or recognizes a set of five or ten on the ten frames).

Day 3
1. The teacher will reintroduce the terms “greater than” and “less than.” Have the students turn to a shoulder partner and briefly discuss the terms. Have students share their thinking (perhaps even modeling the terms using tiles).
2. The teacher will display two sets of tiles for students to decide which set is greater than the other one. Repeat the procedure having students point out one set that is less than the other one. A third set of tiles can be added if needed. Students will continue to decide which is greater than or less than the other ones.

3. Pass out one ziploc bag of color tiles to each group of four students. Bags should contain between 11 to 20 tiles each. Students will empty the bag and separate the tiles by color (red, yellow, blue, green). After separating the tiles, the teacher will ask questions about the number of tiles. (Examples: How many red tiles? How many yellow tiles?) Observe the groups as they tell which color tiles has the greatest number and the smallest number within their group. Encourage students to agree or disagree with other students and explain their thinking.

4. The teacher will introduce the term “equal” as it arises within the groups. The teacher will identify student groups that have an equal number of the same colored tiles. The teacher will have these students share their tiles and explain how they know the tiles are equal in number.

5. Pass out copies of the Greater Than/Less Than Template (Attachment #4) to each student along with dice for students to use in groups of two. The number of dice (either one, two or three) will vary depending upon prior teacher observation. Students will take turns rolling the dice, count the dots and use the color tiles to make a number equal to, greater than and less than the number. Students will use the template to display their tiles when completing the activity.

Lesson Closure


2. Art Activity and Number line – allow students to create number drawings on index cards to use in creating a number line. Assign

Essential Questions:

- Why do we use numbers?
- What is the value of a numeral?
- What do numerals represent?
- What is counting and how do we use it?
- How are numbers used in daily life?
- How do we use “greater than” and “less than” every day?
students a number to write on the front of the index card and draw the corresponding number of objects on the back. Have students place their cards in the correct positions on the number line made of yarn/string and clip it to the string (using clothespins or clips). Display the number line in the classroom.

3. Think, Pair, Share – students will think of things they have learned about numbers and discuss with a partner. Then students will share out responses. Write student responses on chart paper to post in the classroom.

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<thead>
<tr>
<th>Standards for Mathematical Practice</th>
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<tbody>
<tr>
<td>✓ Make sense of problems and persevere in solving them.</td>
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<td>✓ Reason abstractly and quantitatively.</td>
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<td>✓ Construct viable arguments and critique the reasoning of others.</td>
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<td>✓ Model with mathematics.</td>
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<td>✓ Use appropriate tools strategically.</td>
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<td>✓ Attend to precision.</td>
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<td>✓ Look for and make use of structure.</td>
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<td>✓ Look for and express regularity in repeated reasoning.</td>
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### Supplemental Activities

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<th>Intervention</th>
<th>Enrichment</th>
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<td>• Identify different size groups of objects up to 5 or 10 with individual at-risk students. The teacher should place various items (counters, cubes, and tiles) in sets for the students to count.</td>
<td>• Allow students to use multiple ten frames to make numbers larger than 20. The teacher can use a 100 chart to allow students to select a number to create using counters on the ten frames.</td>
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• Where do we see numbers each day?  
• How can we represent numbers using counters?
• Identify correct number of objects (counters or tiles) for a given number up to 20. The teacher should display a number card for the students to count out the corresponding number of objects.

• Count to 20 by ones. The teacher may use a number line to support students in counting to 20.

• Demonstrate one to one correspondence using number cards and various counting objects (buttons or cubes). The teacher can work with the students individually to count out the number of objects to match each number card. The teacher will make sure the student is touching each object when counting aloud.

• Use only one die for the Greater Than/Less Than activity (Attachment #4)

• The teacher can work with struggling students to define “greater than”, “less than”, and “equal to” in kid friendly language. Make sure students understand that “greater than” means more and “less than” means less. Begin to use “more” and “less” than statements in the classroom. The teacher should look for ways to use the terms throughout the school day.

• Use a 100 chart for students to locate numbers and discuss greater than and less than. The teacher can say aloud a number (1-100) and allow students to find a number that is greater than and less than that number.

• Allow students to create a number line displaying numbers larger than 20.

• Work extensively with dot cards so students begin to subitize. The teacher can display a dot card to the students for a few seconds and then turn it over. The students will draw the arrangement of dots they saw on the dot card. Then have students share their drawings and display the original dot card to facilitate discussion.

• Fill in missing numbers in a series. The teacher may use a blank 100 chart and fill in many of the numbers. Then allow the students to fill in the missing numbers.
### Performance Based Assessment Task

**Performance Task:** Counting - Greater Than, Less Than or Equal

**Performance Target:** (K.CC.4, K.CC.5, and K.CC.6)
- Understand relationship between numbers and counting
- Count to answer “how many?” questions about 20 objects or less
- Identify whether the number of objects in a group is greater than, less than, or equal to the number of objects in another group

**Materials:**
- 6 small clear cups or tubs
  (using a dry erase marker, label the cups with the numbers 3, 5, 10, 12, 14, and 17)
- 40 counters
- Greater Than, Less Than, Equal To Cards (*Attachment # 5*)

**Procedures:**
1. Display sets of counters in various arrangements
   (sets of 4, 9, and 15)
   Have student count aloud the number in each set.

**Rubric:** Student Score Sheet (*Attachment #6*)

Possible/plausible student responses: (15 points possible)

1. Student will receive 1 point for correctly counting each set of 4, 9, and 15 counters (total of 3 points possible).
2. Student will receive 1 point for each cup that is correctly filled with counters (total of 6 points)
3. Student will receive 1 point for each correct answer (total of 6 points). Accept any student answer that meets the “greater than,” “less than” or “equal” criteria.
2. Place the 6 cups in front of the student. Have the student place counters in each cup to correspond with the number written on the cup.
3. Place a “greater than,” “less than,” or “equal” card in front of each cup. Instruct the student to tell a number that corresponds with the card.
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Mathematics
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Fill the Frames

Note: Ten Frames may also be purchased from www.EAIEducation.com for long-term use.

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Get to 20!

**Materials Needed:**

- 1 foam die
- Two-color counters

**Objective:** Students will work in pairs to see who can “get to the number 20” first.

**Directions:**

1. One student rolls the die and collects that number of counters on the table.
2. The second student rolls the die and adds that many counters to the collection on the table.
3. Each pair of students will count aloud together to determine the total number of counters on the table after each student has a turn.
4. Play continues until each student has collected a combined total of 20 counters or more.

**Extension options:**

- Use two or more dice.
- Collect counters to “get to the number 30” or a larger.
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Dot Cards and Number Cards 11-20
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Dot Cards and Number Cards 11-20

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Greater Than/Less Than Template

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Greater Than/Less Than or Equal To Cards

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Note: The teacher may add or remove rows based on class size.