



Constructing Task: Seating the Class

Approximately 3-5 days

STANDARDS FOR MATHEMATICAL CONTENT

MCC2.OA.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

~~**MCC2.MD.10.** Draw a picture graph and a bar graph (with single unit scale) to represent a data set with up to four categories. Solve simple put together, take apart, and compare problems using information presented in a bar graph.~~

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.

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson*****

BACKGROUND KNOWLEDGE

(Information quoted from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades K-3, page 83)

“In the beginning, children will be able to use the same models- sets and number lines- for all four operations. A model not generally used for addition but extremely important and widely used for multiplication and division is the array. An *array* is any arrangement of things in rows and column, such as a rectangle of square tiles or blocks.

To make the clear connection to addition, early multiplication activities should also include writing an addition sentence for the same model.”

ESSENTIAL QUESTIONS

- What is an array?
- What is repeated addition?
- How can rectangular arrays help us with repeated addition?
- How are arrays and repeated addition related?
- How does skip counting help us solve repeated addition problems?
- How can we model repeated addition equation with an array?
- How can we determine if a number is odd or even?

MATERIALS

- Counters, square tiles, other manipulatives
- Half-Sheet of Chart Paper

GROUPING

Small Group

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

Review the concepts of repeated addition or equal groups by demonstrating examples with students on the whiteboard using the following task:

Mrs. Evans wants to rearrange the desks in her classroom. She wants to organize the students to sit in an array, with each row having the same number of desks. If her class has twenty students, how many different arrays could Mrs. Evans make her desks? Explain your thinking using pictures, equations and words.

Put the students into small groups to allow them to decide on ways that Mrs. Evans could organize her class into equal rows. You may want to incorporate the word “group” so students can begin to focus on the grouping as it associates with rows and repeated addition. **You can expose them to the word divide (separate), but it should not be a focus as you are talking to the students about what they are doing.** Encourage students to come up with as many ways possible. Have students use the chart paper to demonstrate the various ways they divided up the 20 students, and help them explain the strategy they used. Make sure to have students explain the arrays they created using pictures, words, and repeated addition. Encourage conversations on how to use their understanding of odd and even to assist in this task.

Teacher note: Understanding the connection between repeated addition and equal groups is the goal; this will develop a foundation for multiplication. As students are working, look for students who have found various ways to organize the desks.

Part II

After students have completed the task, choose students who used a variety of strategies to share with the class. Act out some of their strategies. Keep a class chart to document the different ways the class could arrange the 20 students into rows. Ask students what they notice about the number 20. Is there only one way to separate the 20 students? What addend combinations created a total of 20? In other words, how many different repeated addition equations were we able to write?

FORMATIVE ASSESSMENT QUESTIONS

- How many total students does Mrs. Evans have?
- What is your plan to arrange up the students?
- Will your rows be equal? Should they be? Why?

- How many students will be in each row? How did you figure that out?
- How can you show this through repeated addition?
- Is there another way you could group/divide up the students?
- What strategies did you use to group the 20 students?
- Is there only one way to separate the 20 students?
- What addend combinations created a total of 20?
- How many different repeated addition equations were we able to write?

DIFFERENTIATION

Extension

- If students complete the task, tell the students the class just received a new student. How will they rearrange the desks to fit 21 students?
- How many students could Mrs. Evans have if she is unable to arrange the desks in an array?

Intervention

- Allow students to use square tiles to manipulate to better understand that variety of arrays.

Name: _____



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