Closer To

Overview

Students arrange 3-digit cards to make a number closest to 0, 250, 500, or 1000. They compare numbers and prove which number is closer.

Objectives

Thinking Skills:	Students use number sense to create a number closest to a given number. They use reasoning and mathematical ideas to compare numbers and determine which of two is closer to 0, 250, 500, or 1000.
Mastery Skills:	Students develop strategies (counting up, using a number line, blocks, or algorithm) for naming exact differences between numbers.

Materials

Each pair of students needs:
- Digit Cards/Spinner Blackline Master: Copy on medium weight paper
- 1 paper clip
- 2 pencils
- 1 Score Sheet

- A supply of blocks (to 1000)
- 0 – 1000 number line: Consider using -
  1. A laminated 0-1000 number line included in the grade 2-4 class set.
  2. A student-constructed number line from Grade 3, Weekly Pack-it Lesson #307: "The Big Count."
  3. A metric measuring tape that has millimeter hash marks. This is appropriate only for those students who are up for the challenge. Practice using the tape beforehand to clarify how to locate numbers. For example 278 would be .278 meters, or 278 millimeters, or 2 decimeters, 7 centimeters, and 8 millimeters.

Class Introduction   (20 - 25 minutes)

Demonstrate "Closer To," having two student volunteers play two rounds. Divide the class in half, each half being the "advisors" to each player. To begin:
- Have each student shuffle a set of digit cards and place them face down.
- Each student draws three cards, then names and shows the digits for the class to hear and see.
- One of the players spins the spinner and names the number.
- Each player arranges the digit cards to make the number closest to the number indicated on the spinner. **The number may be higher or lower than the spinner number**: the goal is simply to make a number that is as close as possible.
- Elicit suggestions from the class "advisors" and discuss various arrangements of the digit cards. Have students justify their thinking as they decide on the closest number they can make.

Have students **prove** which number is closer using the number line or blocks. Many differences will be easy to "eyeball" without having to find exact numbers. But students, as mathematicians, must be encouraged to explain and justify their reasoning.
- Have students determine the exact distance, or difference, of each player's number from the number indicated on the spinner. Share strategies for naming differences. Many students will count up to find

the difference, which is a very useful strategy. The number line is an especially good visual aid in this case. Other students, who recognize this task as a comparison subtraction problem, may choose to use an algorithm and/or blocks to find differences.

- All strategies that "work" should be encouraged, as students may use one strategy to find a difference and a second strategy to check their thinking.
- The player who makes the closer number is the round winner. **Both players must agree** on the round winner before playing the next round.

Play another demonstration round, having the second player spin the spinner. Determine the round winner again.

Activity   (10 - 15 minutes)

Explain to students that they will work in pairs and play five rounds, or a game, of "Closer To."

- They will determine the winner of each round, and finally determine the game winner as the player who wins more rounds.

Provide student pairs with digit cards, a spinner, and score sheet. Have a supply of blocks and number lines available, as well.

- Explain how they are to complete the score sheet.
- Observe students as they are working and have them think aloud as they determine the closer number and record it.

Closure   (5-10 minutes)

 After students have played the game, have them reflect on their work. Some questions to guide discussion are:

- What was their closest round?
- Did partners disagree during the game? Did anyone have to convince a partner that they were closer to the number on the spinner? How did they do so?
- What numbers were most challenging/easiest to work with? Why?

- What strategies for determining differences worked well/didn't work well?

Students will likely note that it is easier to compare two numbers that are both higher, or both lower than the number on the spinner. For example, if the spinner reads 500, it is easy to determine if 476 or 482 is closer to 500. It is more challenging, however, to figure out the closer number when numbers are on "either side" of the number on the spinner, for example 462 and 537.

Assessment

As students work, observe and note:
Do they-
- Have a "gut" sense of the relative size of numbers?
- Compare numbers with confidence?
- Justify their thinking with mathematical proof?
- Use materials (blocks, number line) to represent/support their ideas?
- Understand and communicate different strategies for comparing numbers?
- Rely on a more concrete, or abstract, method for determining differences?

Extension

❑ Challenge students to determine a Point Winner for each game. Students add up the differences of their 5 rounds. The player with the **smallest total difference** is the Point Winner of the game.
❑ Modify the spinner to make it easier or more challenging. For example, use half of the number line (0 – 500) and a 6-part spinner with spaces labeled 0, 100, 200, 300, 400, 500 to make an easier game. Or, write numbers such as 426, 732, 291, and 465 on the spinner to challenge students to work with less "friendly" numbers as they determine differences.
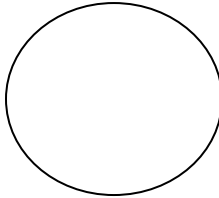
Closer To

Directions:

1. Draw 3 digit cards.
2. Spin the spinner. Write the number in the ◯ .
3. Arrange your digit cards to make a number closest to the number you spun.
4. Record your number in the spaces.
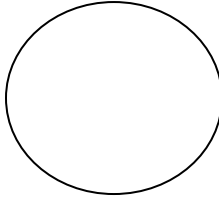5. Determine which number is closer. Draw a loop around the closer number.
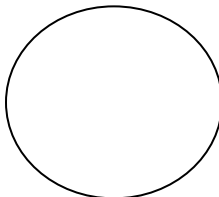

Player #1: _____   Player #2: _____
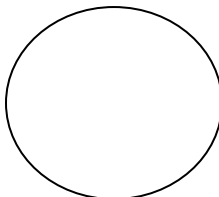
___ ___ ___   ◯   ___ ___ ___

___ ___ ___   ◯   ___ ___ ___

___ ___ ___   ◯   ___ ___ ___

___ ___ ___   ◯   ___ ___ ___
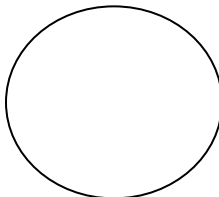
___ ___ ___   ◯   ___ ___ ___

Digit Cards: Each player cuts out and uses a set of 0 – 9.

0	1	2	3	4
5	6	7	8	9
0	1	2	3	4
5	6	7	8	9

Spinner: Use a paper clip and pencil to make a spinner.

0	250
1000	500