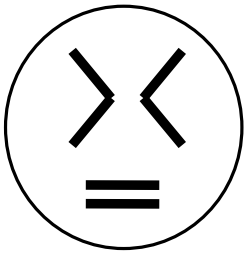


CONSTRUCTING TASK: Silly Symbols >, =, and <

Approximately 2 days

STANDARDS FOR MATHEMATICAL CONTENT

MCC1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones — called a "ten."
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

MCC1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

MCC1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

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.

BACKGROUND KNOWLEDGE

Students should be familiar with representing and comparing numbers. The symbols will be a new concept for most students and there should be ample amount of time allotted for practice. It is important that students are connecting the language with the symbols and not a trick. Often when students learn to use an aid (Pac Man, bird, alligator, etc.) for knowing which comparison sign (<, >, =) to use, the students don't associate the real meaning and name with the sign. The use of the learning aids must be accompanied by the connection to the names: < Less Than, > Greater Than, and = Equal To.

More importantly, students need to begin to develop the understanding of what it means for one number to be greater than another. In Grade 1, it means that this number has more tens, or the same number of tens, but with more ones, making it greater. Additionally, the symbols are shortcuts for writing down this relationship. Finally, students need to begin to understand that both inequality symbols (<, >) can create true statements about any two numbers where one is greater/smaller than the other, (15 < 28 and 28 >15).

ESSENTIAL QUESTIONS

- How can large quantities be counted efficiently?
- How can words and symbols be used to illustrate the comparison of numbers?
- How can number benchmarks build our understanding of numbers?

MATERIALS

- Brown Bags of 90-100 objects (colored counters, buttons, ribbons, 1-inch tiles, beans, noodles: same objects in each bag)
- Silly Symbols Recording sheet

GROUPING

Large group, Partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I

Put the numbers 24 and 41 on the board. Discuss different ways that you could represent these numbers. Allow a few students to come up to the board and draw different representations. Have the students look at the representations and decide which number is greater and which number is smaller. Display a number line and have the students identify where the number numbers are located. When you are looking at the number line, what do you notice about the size of the number and the location on the number line? Engage in a discussion about how you can compare the numbers using the terms greater than and less than. (Example: 24 is less than 41 and 41 is greater than 24) Give the students multiple numbers to identify on the number line and practice verbally comparing. The language is very important in building a deep understanding.

Introduce the symbols that match the words. It is very important that students do not learn a "trick" when understanding the symbols. The symbols should be closely connected to the words they represent. Offer several examples on the board making sure the students are developing an understanding that the size of the number representation should match the symbols and language. The number line will help students understand the size of the number representation and use the language correctly. Discuss the symbols and how they written. Allow additional time for students to practice writing the symbols and reading them correctly.

Now draw a representation of 26 and 26 and identify this number on the number line. How can you compare two numbers that have the same representation and live on the same spot on the number line? Ask the students how they might describe these two numbers in words. If no student presents the language of "equal" then you should introduce it. Discuss ways that show us that two numbers are equal and allow students time to practice writing the symbol and using the language.

Part II

Pass out one bag to each set of partners that were prepared before the lesson. Provide a student number line or remind students of a number line in the classroom for reference. Instruct students to empty the contents of their bag on their desk and separate the objects into 4 piles (the piles do not have to be equal). Students will count the number of objects in the first pile and record that number on the "Silly Symbols" recording sheet. Ask the students: How are you counting your manipulatives? Is there another way? How do you keep track of what has been counted?
As you observe students counting, look for efficient counting strategies. For example, you may observe some students counting by 2's, 3's, 5's, 10's etc. Allow students to choose their own counting strategy and picture representation. Students will do the same for the objects in the 2^{nd}, 3^{rd} and 4^{th} pile. Remind students that they need to show that number using the number and a picture representation. The students will then identify where the numbers live on the number line. The visual location of these numbers on a number line will help students understand the size of each number when comparing. Next, students will complete the sentences at the bottom using the symbols. There should be practice with completing these at the beginning of the lesson. Students can reference the numbers on the number line when reading the sentences aloud to check their work.

Part III

Play the game "Silly Symbols". Students will play the game with a partner. Each pair will need a recording sheet, brown bag with 90-100 objects game board and the 3 symbols cut out. A student number line may also be provided to aid in comparing numbers. Player 1 will reach their hand in the bag, pull out a handful and count the number of objects. Place the objects under player one of the Silly Symbols game board. Player 2 will repeat this same process. The players will decide together which symbol to place in the middle section to make the number sentence true. The students will then identify where the numbers live on the number line. The visual location of these numbers on a number line will help students understand the size of each number when comparing. Both players will then record the information on their own game sheet. In the last column, the students will create an addition sentence combining the two sets for the total sum of pieces. Place the manipulatives back in the bag and repeat for round 2-10.

After the students have completed this game, gather in a common area. Allow the students to read some of their number sentences aloud and share their experiences with this game. Several practice opportunities are needed with reading the symbols aloud for the students to build a deep understanding. The teacher can gather assessments through informal observations, conversations with individual students, and the recording sheet responses.

FORMATIVE ASSESSMENT QUESTIONS

- How can you check if you have used the correct symbol?
- How can a number line help you compare two numbers?
- How many ways can you compare two numbers?
- How did you find the total number of manipulatives for each round?

DIFFERENTIATION

Extension

- Students can write a mathematical story with at least two different comparisons. Students will need to identify the idea of the story, the numbers to be used and the comparisons with words and representations. The students may illustrate the story when complete.

Intervention

- Students can work with numbers smaller than 30, then progress to larger numbers once they have developed some experience with smaller quantities.

Name_____ **Silly Symbols Recording Sheet**

Pile A	Pile B
Number: _____ Picture:	Number: _____ Picture:
Pile C	**Pile D**
Number: _____ Picture:	Number: _____ Picture:

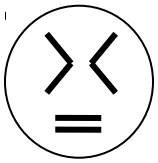
Use the following symbols to complete the sentences below. **>, =, or <**

Pile A is _____than pile B. **Pile B is _____than pile A.**

Pile C is _____than pile D. **Pile D is _____than pile C.**

Pile D is _____than Pile B. **Pile A is _____than Pile C.**

Silly Symbols Game Sheet



Round	Player 1 Number of Objects in handful	Symbol >, =, or <	Player 2 Number of Objects in handful	How many objects in all?
Example	*21*	<	*46*	*21+46=67*
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Silly Symbols Game Board

Player 2	
Symbol	
Player 1	

Cut symbols to use for Silly Symbols game. Each group will need one of each symbol.