Three-Digit Place Value

Strand: Number and Number Sense

Topic: Identifying the ten-to-one relationship among ones, tens, and hundreds

Primary SOL: 2.1 The student will

                     c)   compare two whole numbers between 0 and 999

Related SOL: 2.1a

Materials:
- Base-10 blocks
- Place-value Mat (attached)
- Three-Digit Place-value Recording Sheet (attached)
- Deck of playing cards or number cards

Vocabulary:
 digit, equal, greater than, greatest, least, less than, place value (earlier grades), *value*

Student/Teacher Actions: What should students be doing? What should teachers be doing?

(Note: Precede this activity with an activity for students to demonstrate understanding of the ten-to-one relationship among ones, tens, and hundreds, using manipulatives.)

1. Tell students that they will play the Three-digit Place Value game. Distribute the Three-digit Place-value Recording Sheet and Place-value Mat. Group students into pairs, and give each pair a deck of cards from which all tens and all face cards have been removed, a place value mat, and a set of base-10 blocks. Tell students that ace cards count the same as ones. If you are using a standard deck of playing cards, the ace counts as one.

2. Direct one student in each pair to draw a card and place it above the hundreds place on the Place-value Mat. Instruct the student to create in the top part of the hundreds column the number shown on the card, using base-10 blocks. Then, direct the second student in each pair to take a turn, drawing a second card and placing it above the tens place, and creating the drawn number in the top part of the tens column, using blocks. The first player then takes another turn, creating the drawn number in the top part of the ones column. Once the three-digit numeral has been created, have student pairs write the three digits above the first three boxes on their recording sheets and draw the base-10 block models of the three digits *inside* the boxes.

3. Have student pairs repeat step 2 to create a second three-digit numeral in the bottom part of their place value mats and write and draw it above and inside the next three boxes on their recording sheets. See example below:

4. When student pairs have written and drawn two three-digit numerals side-by-side on their recording sheets, have them discuss whether the first numeral is *greater than, less than,* or *equal to* the second. Have them write >, <, or = in the circle between the two numerals.

5. Finally, have pairs write a justification for the comparison underneath (e.g., "I know that [first three-digit numeral] is greater than/less than/equal to [second three-digit numeral] because _____." Encourage students to use the base-10 block models to help them make the justification.

6. Have student pairs play several more rounds of the game to create several more pairs of three-digit numerals for comparison.

7. As a closing activity, write a three-digit number on the board. Each group will build a number that is *greater than, less than,* or *equal to* the number written on the board.

8. Review and summarize with the class what students did and learned in the activity.

Assessment
- **Questions**
  - When comparing three-digit numbers to determine which number is greater, what place value should be considered first? Why?
  - What does *equal* mean?
  - How is comparing three-digit numbers similar to comparing two-digit numbers? How is it different?
  - How can a number line be helpful in comparing numbers?

- **Journal/writing prompts**
  - Natalia has these three cards: 3, 8, 4. Describe how she can arrange the cards to make the largest possible number. Also, describe how she can arrange them to make the smallest possible number. Explain why Natalia would choose to arrange them in this order.
  - Vince and Kevin are playing the Three-Digit Place Value game to see who can make the largest three-digit number. Vince has these cards: 4, 2, 6. Kevin has these cards: 8, 5, 7. If Vince has made the largest three-digit number, explain what card he drew first and what card Kevin drew first. How do you know?
  - Natasha is playing the Three-Digit Place Value game. Her cards were drawn in this order: 7, 2, 6. After comparing her hundreds place to her opponent's hundreds place, she realizes that she has the smaller number. Draw a picture of Natasha's place value mat and the possible place value mat of her opponent. Explain your thinking about Natasha's opponent's number.

- **Other Assessments**
  - Circulate during the activity to observe students' strategies and rationales for creating the models of the three-digit numbers and comparisons. Note who is having difficulty identifying the values, making the models of them, and/or comparing the three-digit numbers. Give help, as needed.

- o Display a three-digit number. Ask students to create a number greater than the displayed number, a number less than the displayed number, and a number equal to the displayed number. Have students record their comparisons on small sheets of paper and explain their reasoning as exit tickets. Collect passes for assessment.
- o Create signal cards (green, yellow, and red) to check for understanding. Green means "I got it." Yellow means "I'm not sure," or "Maybe." Red means "I'm lost. I need more help." Pause at different points in the activity, and ask students to hold up their signal cards. Give help, as needed.

Extensions and Connections (for all students)

- Have the students play "Fill-in-the-Blank." They each select three cards and place them in any order they wish to meet the specified criteria (e.g., the smallest three-digit number or the largest three-digit number). Ask questions such as: "Who has the largest/smallest number? Does anyone have a number greater than/smaller than Joe/Sue? How do you know?"
- Have students do this activity using only two-digit numbers. They might also find the difference between the larger two-digit number and smaller two-digit number (e.g., I draw a 2 and a 7; therefore, 72 is my larger two-digit number and 27 is my smaller. I then find the difference between 72 and 27).
- Repeat the activity, but have one student in each pair create a two-digit number while the other student creates a three-digit number.
- Add the jokers to the decks of cards to represent zero. Have the students play again, using zero. Ask, *"If you pull zero as your card, where are you most likely to place it? Why?"*

Strategies for Differentiation

- Use grid paper to help students compare place values vertically rather than horizontally.
- Use dot or number cubes instead of cards.
- Have students use a blank number line and make decisions about where to place numbers on it. By placing the numbers being compared to each other on the number line, students are able to see instantly which number is larger and which is smaller by looking at their position on the line. Students may choose to add as many other numbers to the line as needed to make a good comparison.
- If students are having trouble using the left-to-right order for comparison, teach a mini-lesson to model starting on the left, using appropriate language.
- Use green and red highlighters to color the first number in the comparison green and the second number red. This visual suggests to students that green is where you start and red is where you stop or finish.
- Search for online activities, using key terms such as, "number comparison," "number chomping," and "greater than less than." Online activities may be displayed on interactive whiteboards or through student computers.

- Create a card with the expression "is greater than" and the symbol written on one side and the expression "is less than" and the symbol written on the other. Have students flip the card as needed to complete the comparison. Have them take turns saying the comparison.
- Redirection and corrective feedback should be given throughout lesson.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Number Cards

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

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

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

Three-Digit Place-value Recording Sheet

Round 1

I know that _____, because
_____.

Round 2

I know that _____, because
_____.

Round 3

I know that _____, because
_____.

Round 4

I know that _____, because
_____.

Place Value Mat

Hundreds	Tens	Ones