

Grade 4 Mathematics

Number and Number Relations: Lesson 2

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol (\Rightarrow) by them.

Purpose of Lesson 2:

- In this lesson, the tutor and the students will
 - ✓ understand the terminology of more, less, between, compare, and order;
 - ✓ compare whole numbers;
 - ✓ use the symbols for $<$, $>$, $=$; and
 - ✓ order whole numbers.

Equipment/Materials Needed:

- Sets of 10 number cards with the digits 0 – 9 for each student and one for yourself (See Student Sheet 6.)
- Copies of Student Sheets 7 and 8
- Paper and pencils, paper clips

Preparations before beginning Lesson 2:

- Run off a few copies of Student Sheet 6. You can get 3 sets of cards from each sheet. Run off on card stock or heavy paper. It would be better if each set of cards were a different color. Cut out the numbers. Paper clip a set for each student.
- Run off 1 copy of Student Sheets 7 and 8 for each student.
- Have paper and pencils available.

Lesson 2: Number and Number Relations

Say:

What does it mean to have “more” than 5 apples? (Sample Response: something like 6 apples. They have given you “one” more than 5.) **Could you have 100 apples, 1000 apples, 1 million apples?** (Yes.) **Any amount greater than 5 would be more. More means to have an additional amount.**

If you had 4 apples, would you have more than 5? (No.) This question leads to the idea of *less*. 4 is 1 less than 5. **How many apples could you have and still have fewer than 5 apples?** (4, 3, 2, 1, 0 apples) **Another word for less is fewer. When we compare two numbers we decide which number is greater or less (fewer).**

Introduce the idea of “between.” **I am going to have a party with between 10 and 15 people. How many people will be at my party?** (They should say 10, 11, 12, 13, 14, or 15. Technically, the answer should be 11, 12, 13, or 14 because you have asked for the numbers between 10 and 15. Between does not include the endpoints. However, in everyday use, we often include 10 and 15.)

⇒ Give the students sets of the 10 number cards from Student Sheet 6. Have a set for yourself. Each student should shuffle his/her cards. You should turn up 1 card and have the students do the same.

Say:

We are each going to use the cards to make numbers. Turn up 1 card. I will do the same. Does your card show a number that is more or less than mine? Put those cards on the side and turn up a new card. **Does your card show a number that is more or less than mine?** Continue until you have gone through all 10 cards. As you and the students turn up cards, change the questions that you ask. **Is your number larger than mine is? Is your number smaller than mine is? Does anyone have a card that is 1 more than mine?** When the last card is turned up, have the students put the cards in order from least to greatest. Return these cards to the students. (It helps if each student’s set of cards is a different color.)

⇒ Use the cards (shuffle again) to make new numbers. This time, you are allowed to use 2 cards to make a number, but the students can use only 1 card.

Say:

I am going to use two cards this time. I will make a 2-digit number. The first card that I turn up will be the number in the tens place; the second card will be in the number in the ones place. You can turn up only 1 card. What place will your card show? (ones) Does your card show an amount that is more or less than my cards show?

Each time you compare the numbers, yours will be larger. (The only time that the numbers might be the same is if you pull a 0 for the first card. For you to have a zero would mean that you have no tens. For example, 09 is the same as 9.) Continue comparing cards. Two or 3 times should be enough for students to see that your amount will always be greater. **Why do you think my amount was always greater than yours?** (Numbers with tens digits will always be larger than numbers with only ones digits.)

⇒ Shuffle the cards again. This time both you and the students will use 2 cards. Turn up your 2 cards and compare them to each student's cards.

Say:

This time, we can both use 2 cards. How many digits will our numbers have? (2) You must place the cards in the order that you turn them up. The first card will be the number in the tens place; the second card will be the number in the ones place. Is the amount that your cards show greater than the amount that my cards show? How do you know that your number is greater?

(Sample responses: I have more tens than you have. We have the same number of tens, but I have more ones than you have, etc.) After you have done this activity maybe 5 times, allow the students to change the rules. They can place the digits in either order. On the last round, have the students put the numbers in order from smallest to largest. Watch what they are doing. They will need to compare two numbers, then compare two other numbers, etc. until they have all of the numbers in order.

⇒ Shuffle the cards again. This time you get to use 3 cards to make a number, but the children can use only 2.

Say:

This time I will use 3 cards to make a number, but you can use only two. How many digits will my number have? (3) How many digits will your number have? (2) My number will have digits in hundreds, tens, and ones places. In which places will your numbers have digits? (Tens and ones) Both you and the students should show your numbers. Does anyone have a number that is greater than mine? (No.) Why not?

(With the exception of a zero in the hundreds place, you can make numbers in the hundreds; they can only make numbers with tens and ones. This activity is really important to do a few times. You want them to discover that the number of digits and the place value of the digits are important. Be careful not to say something like “My number is larger because it has more digits.” This statement is true only if you are comparing whole numbers: for example, 4.55 is not greater than 45.

⇒ Shuffle the cards again. This time both you and the students can use 3 cards. Lay yours down and challenge them to use their 3 cards to make a number that is greater than yours, or smaller, or one with the same hundreds digit., etc. Do this activity at least 4 or 5 times.

⇒ Shuffle the cards again. This time you can use 4 cards to make a number and they can use only 3. Hopefully, they will realize that your number will always be greater. If this fact is still not obvious, make a few numbers. Shuffle the cards again. This time you and the students both use 4 cards. Lay yours down and challenge them to make a larger, smaller, etc. number.

Say:

Remember that a few minutes ago, I said that, when comparing numbers, we look to see which number is greater. When comparing whole numbers, it may help you to list the numbers in a column, lining up the ones place. Then start at the left and compare the values of the different places. Why do you think we start comparing at the left? (The values are larger as you move to the left.)

⇒ Write the numbers 1465 and 984 on the board.

Say:

To compare the numbers 1465 and 984, line up the ones place.

1465

984

Because there are no thousands in the second number, it must be smaller.

⇒ Write the numbers 356 and 458 on the board.

Say:

These 2 numbers have the same number of places, so you have to compare the hundreds. Four hundreds is greater than 3 hundreds, so 458 must be greater than 356.

356

458

⇒ Write the numbers 3287 and 3209 on the board.

Say:

These 2 numbers have the same number of places and the same value in the thousands and hundreds places. You have to look at the tens place. Since the top number has more tens, it must be greater.

3287

3209

Say:

Sometimes we don't want to have to write out the words *greater than* and *less than*. We can use symbols for these words. The symbol for greater than is ">" and the symbol for less than is "<." (Write these symbols on the board.) Does anyone have a way that you remember what direction the sign faces? Some think of the sign as an alligator's mouth or Pacman's mouth. If I have the numbers 6 and 8 to compare, $6 < 8$. The open face of the sign always faces the larger number. The alligator would want to eat the larger number. If I wrote $8 \underline{\quad} 6$, it would be $8 > 6$. Again, the open face of the sign points to the larger number.

⇒ Give Student Sheet 7 to the students. This activity sheet will give them practice in more, less, and between, and in comparing numbers. You may want to do this activity as a group and ask one student to explain his/her thinking about each one.

Answers:

- | | | | | | |
|---------|--------|---------|---------|-------|--------|
| 1) 57 | 2) 999 | 3) 10 | 4) 1038 | 5) 68 | 6) 346 |
| 7) 8765 | 8) 150 | 9) 3049 | 10) D | 11) D | 12) > |
| 13) = | 14) < | 15) > | 16) D | 17) A | |

Say:

When ordering 3 or more numbers, you can look at two of the numbers, and compare them. Then you can look at the third number and compare it to the larger of those two. You can keep doing this activity until you get all of the numbers in order.

⇒ Write the numbers 5235, 6721, 4652, and 356 on the board.

Say:

Let's order 5235, 6721, 4652, and 356. It is easy to see that 356 is smaller than the other numbers, so it is the smallest. Next compare 5235 to 6721. Which is less? (5235) Next compare 5235 to 4652. Which is less? (4652) So the order is 356, 4652, 5235, 6721.

Another way of doing this activity is to think about place value. You know 356 is the smallest, because it has no thousands place. All of the others are in the thousands. 4000 is next, then 5000, then 6000.

⇒ Give Student Sheet 8 to the students for ordering numbers.

Answers:

- | | | | |
|---|---------------------------|----------|-----------|
| 1) Christie | 2) Nicole | 3) Scott | 4) Mark's |
| 5) Christie; Nicole | | | |
| 6) Nicole, Mark, Jessica, Scott, Christie | | | |
| 7) 4675, 3423, 3333, 1674 | 8) 1456, 2117, 2711, 3423 | | |

⇒ Have one student summarize today's lesson.

Student Sheet 6 (Number: Lesson 2)

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

Student Sheet 7 (Number: Lesson 2)

In problems 1 and 2, write the number that is 1 less.

- 1) 58 _____ 2) 1000 _____

In problems 2 and 3, write the number that is 1 more.

- 3) 9 _____ 4) 1037 _____

In problems 5 – 7, choose the number that is the larger in each pair.

- 5) 68 or 62 6) 59 or 346 7) 8765 or 8763

In problems 8 and 9, choose the number(s) that is (are) between the other 2 numbers.

- 8) 124 _____ 183 201 124 150 185

- 9) 3042 _____ 3054 3145 3055 3032 3049

10) Choose the amount that is greater than 70¢.

- A. 69¢ B. 36¢ C. 70¢ D. 84¢

11) Choose the amount that is less than 76¢.

- A. 98¢ B. 78¢ C. 83¢ D. 57¢

In problems 12 – 15, write <, >, or = in each blank.

- 12) 147 _____ 138 13) 54 _____ 54

- 14) 450 _____ 540 15) 1021 _____ 1019

In problems 16 and 17, choose the correct answer.

16) Which number is $>$ 110?

- A. 109
B. 90
C. 101
D. 120

17) Which number is $<$ 2243?

- A. 2239
B. 2423
C. 3103
D. 2250

Student Sheet 8 (Number: Lesson 2)

The chart shows the heights of the Warren children. Use the chart to answer the questions.

Name	Height
Scott	120 cm
Mark	95 cm
Christie	150 cm
Nicole	90 cm
Jessica	110 cm

1. Which child is taller than Scott? _____
2. Which child is shorter than Mark? _____
3. Which child is taller than Jessica but shorter than Christie?

4. Which child's height is between Nicole's and Jessica's?

5. Which child is the tallest? _____; the shortest? _____
6. Order the children from shortest to tallest.

7. Write the following numbers in order from greatest to least.

3423 1674 4675 3333

8. Write the following numbers in order from least to greatest.

3423 2117 2711 1456
