Discover!

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# MATH

## INSTRUCTOR GUIDE

LESSON 14

# Comparing Numbers With Symbols

## Lesson Objectives

By the end of this lesson, your student will be able to:

- compare numbers using greater-than and less-than signs
- order numbers from least to greatest

## Supporting Your Student

The pages in this section contain two types of text.

The standard text describes tips for implementing the lesson with your student. It is not intended to be read aloud. The italicized text is intended to be read aloud to your student as you complete the lesson together.

**Take a Closer Look** ***(Which Group Has More?)***

*These kids are hiking at the Oregon Trail Nature Park. Are more kids girls or boys? Tell your instructor how you know.*

If your student needs support, guide their thinking by sharing the following prompts: *How can you find out which group has more? Start by counting the girls and counting the boys. Now, what do you notice about those numbers? Which is larger? How do you know 4 is greater than 3?*

**Explore**

*You have arrived at your first pit stop on your voyage, the Oregon Trail Nature Park in Kansas. Over 150 years ago, immigrants passed through this very spot on their expedition to the West. While at the park, you read that popular animals are often seen, such as prairie chickens, quail, wild turkeys, white-tailed deer, and raccoons.*

*While walking on the nature trail, you stumble across some different eggs. How can you tell which bird has laid more eggs?*

*Place value is a useful tool that helps you understand how much is in a number. It can also help you compare numbers to understand which is bigger or smaller.*

*For example, think about the 13 prairie chicken eggs and the 35 quail eggs you found. You probably know right away which set has more eggs in it, but how do you know?*

*You probably used place value to compare these numbers, even if you did not realize it! How do you think place value helps you compare numbers? Talk to your instructor about your thoughts.*

## Sharpen Your Skills

Go to the digital content for this lesson to practice the addition facts for 13. You can practice with digital flashcards and take a quiz. If you do not have access to the digital content, you can use physical flashcards to practice the facts.

**Read** ***(Comparing With Place Value)***

*Your second stop is in Guernsey, Wyoming. This is a beautiful spot right outside the Oregon Trail Ruts State Historic Site and has some of the best-preserved wagon marks anywhere. It was more than 150 years ago and the wagon wheel marks from traveling are still in the dirt.*

*You are curious to know how many miles the pioneers traveled each day by wagon and foot. Resources say that an average of 15 miles were traveled each day. If the weather was nice and the pioneers had no mishaps, they could travel up to 20 miles per day.*

*In Lesson 9, you learned that when you* ***compare*** *numbers, you tell if a set has more or less than another set. Place value can help you compare. Think back about the number of miles the pioneers could travel per day. They could travel between 15 and 20 miles per day. How do you know which of these numbers is greater?*

*Using your place value mat and place value blocks, look at the tens place. 15 has a 1 in the tens place. 20 has a 2 in the tens place. Since 2 is larger than 1, 20 is greater than 15.*

*Now, use place value to compare 15 and 17. Both have a 1 in the tens place. The tens are equal, so look at the ones place instead. 15 has five ones, and 17 has seven ones. Since 7 is larger than 5, 17 is greater than 15.*

**Write** ***(Explain how you can use place value to compare the numbers 45 and 71.)***

To help your student explain how they can use place value to compare the numbers 45 and 71, ask them to identify the number in the tens place of both 45 and 71. Then, talk to them about which of those numbers

is larger. If needed, encourage your student to draw a model to compare the numbers 4 and 7. Allow your student to draw an answer with labels in place of writing, if necessary.

### Read *(Greater Than and Less Than)*

*Before heading on the road again, you come across the road sign with two different symbols on it. The symbols are pictures and they help people know traffic laws, hazards, locations, directions, and where services are located. The symbols you see on the road sign help you understand if you are going the right way on the rest of your journey.*

*There are also many symbols used in math. Some symbols are for comparing numbers.*

*The > symbol is called the greater-than symbol. It is used to make comparisons like 34 > 17.*

*< is the less-than symbol. It is used to make comparisons like 42 < 68.*

*In some comparisons, the numbers are not greater or less than each other. Instead, they are the same or equal. You use an equal sign, =, for these comparisons.*

*The equal sign is not only for equations. It means that the numbers, or groups of numbers, on both sides of the sign are the same or equal to each other.*

Think about the greater-than and less-than symbols as arrows. The greater-than symbol would be pointing to the right of the number line because it is telling you that number is higher than what you are comparing it to. The less-than symbol is the opposite. It points down the number line because it is telling you that the number is lower than what you are comparing it to.

### Take a Closer Look *(Which Way?)*

*To remember the difference between the > and < symbols, think about an alligator's mouth. A hungry alligator would want to eat the larger number. Listen as your instructor says two numbers. Use your arms to make an alligator mouth to show the correct symbol.*

Demonstrate with your arms the greater-than and less-than symbols. Say the numbers, then your student will pretend they are an alligator. You will write two numbers on a board or paper. Your student will show which one the alligator would eat by using their arms. Remember, the alligator is super hungry and will always eat the bigger number.

Some suggestions for numbers to use are the following:

- 14 and 23
- 16 and 14
- 26 and 29
- 38 and 48

### Write *(Is it true that 68 < 54? Use place value to explain how you know.)*

Encourage your student to begin by reading this comparison to you: 68 is less than 54. Once they have read it and determined the meaning of the < symbol, ask them if that comparison makes sense. How do they know? Remind them to think about the tens and ones to help them answer this question.

### Practice *(Comparison Symbols)*

*Fill in a number to make each comparison true.*

1. ____ > 17
2. ____ < 51
3. ____ = 16
4. ____ > 20

Read each blank as "something" to start. For example, the first problem says "something" is greater than 17. Ask your student: What number could it be? Is there only one answer, or is there more than one way to answer this?

### Play *(Comparing Numbers)*

*Create your own card game to practice comparing numbers. Start by making a set of cards. Cut some pieces of paper into small rectangles. Write a different number between 10 and 100 on each card. Split the cards into two piles and place both piles facedown. Keep a pile and give a pile to your instructor. Flip over a card from each pile and compare them. Whose number is larger? How do you know?*

### Read *(Ordering Numbers)*

*Pioneers on the Oregon Trail were moving for the same reasons as people move to places today. Your parents probably have moved for a better job, a house to accommodate your family, or even to be closer to family.*

# Comparing Numbers With Symbols

*Since the pioneers could only bring what would fit in their covered wagon, they had to think about what was the most important and what was the least important, taking only the items that were truly needed.*

*Also, when preparing meals, they needed to count what they had the greatest of and the food they had the least of. If they needed more of something, they could trade with other pioneers or be creative with what they had.*

*Look at the image. The **least number** is the smallest number. The 3 loaves of bread are the smallest amount, so they are first. The **greatest number** is the largest number. The potatoes have the greatest amount of 7, so they are arranged last.*

*If you look at a number chart or number line, you see that 4 is in between 3 and 7, so the bags of cornmeal go in the middle.*

If your student needs additional guidance in understanding this concept, encourage them with a number line or a hundreds chart. Ask them which number comes first in the number line or chart. Then, ask the number that comes next and so on. They may need the math tools throughout the lesson.

### Write *(Number Arrangement)*

*What if they arranged the food from greatest to least? What would that order look like and what changed?*

Before your student writes, have them arrange the numbers from greatest to least. Ask them the following questions to help prepare them for the writing portion.

- Is the same number going to be first?
- What about last?
- Does the middle number move? Why or why not?

### Practice *(Comparing and Ordering)*

*Write the name of each symbol.*

**1.** > ____

**2.** < ____

**3.** = ____

Write the following numbers from least to greatest.

**4.** 9, 5, 16, 13, 6, ____, ____, ____, ____, ____

**5.** 20, 1, 7, 14, 12, ____, ____, ____, ____, ____

Answer the following question.

**6.** Draw tens and ones to prove why each of these comparisons is true.

To answer items 1 through 3, encourage your student to think about the way the arrow is pointing to help them answer. If needed, they may benefit from writing numbers on either side to visualize the use of the symbol. For the drawing segment, have your student draw a tens and ones model of each number. Then, encourage them to consider the difference between each model and circle it.

*In this lesson, you learned:*

- *Place value can be used to compare numbers.*
- *> is the greater than symbol, and < is the less than symbol.*
- *Some comparisons use an equal sign (=).*

*Think About It*

*Do most comparisons have only one answer or more than one answer? Why?*

### Skill Builder *(Operations and Algebraic Thinking)*

*Equations can be compared with symbols too. Solve both sides of the following equations. Then, fill in the missing >, <, or = sign.*

**1.** *5 + 1 ____ 3 + 3*

**2.** *10 + 0 ____ 6 + 2*

**3.** *16 + 2 ____ 10 - 10*

**4.** *4 + 4 ____ 6 + 6*

Your student may want to write the answer to each equation over the addition or subtraction problem, then compare those and fill in the missing symbols.

### Skill Builder *(Measurement and Data)*

*Use the chart to finish each comparison statement.*

*1. More people like carrots than _____.*

*2. Fewer people like crackers than _____.*

*3. More people like grapes than _____.*

*4. Fewer people like pretzels than _____.*

Remember, there is more than one way to answer many comparisons! Remind your student to look for

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an item from the chart that can make each of these comparisons true.

### Show What You Know

*Read each comparison statement.*

*Circle True or False.*

**1.** *True or False 46 > 17*

**2.** *True or False 19 > 31*

**3.** *True or False 62 = 26*

**4.** *True or False 72 > 27*

**5.** *True or False 19 < 14*

*Complete each comparison. Use >, <, or = to fill in the blanks.*

**6.** *40 _____ 50*

**7.** *54 _____ 52*

**8.** *39 _____ 39*

**9.** *10 _____ 100*

*Choose the correct answer.*

**10.** *Which numbers are shown from least to greatest?*

**A.** *3, 8, 5, 7, 1*

**B.** *13, 15, 5, 17, 4*

**C.** *6, 9, 13, 15, 18*

**D.** *5, 7, 2, 10, 14*

*Answer the following questions.*

**11.** *Put the numbers 14, 4, 16, 20, 1, 3,10, 7 in order from least to greatest.*

**12.** *Explain how you could use place value to compare the numbers 54 and 51.*

## Learning Styles

**Auditory learners** may enjoy verbally responding to prompts such as, "Tell me a number greater than 43" or "Tell me a number less than 61".

**Visual learners** may enjoy comparing groups of items in different pictures to determine which has more or less.

**Kinesthetic learners** may enjoy building different numbers using base ten blocks or connecting cubes and using these models as a basis for comparisons. They may also enjoy making the "alligator mouth" with their arms to practice greater than and less than.

## Sharpen Your Skills Support

Math facts and skills are included in each lesson to provide your student with opportunities to practice the skills they need to be successful in their coursework. Flashcards can be used to sharpen your student's math facts and skills.

To help your student with their math facts or skills, use the digital content or physical flashcards to practice. If your student has already mastered this math fact or skill, challenge them with another math fact or skill they still struggle to understand.

## Booster Activity

### Decomposing Numbers

Use base ten blocks to encourage your student to explore decomposing numbers in various ways. Prompt them to use their base ten blocks to build a number between 10–100, or larger numbers for an additional challenge. Then, encourage them to use their base ten blocks to find at least two different ways to decompose the number by breaking the base ten blocks into different groups. They may also wish to exchange a ten for ten ones to find even more ways to decompose each number. Once they have decomposed each number, give them another number to decompose and prompt them to identify if it is more or less than the previous number they worked with.

### How Am I Counting?

Increase your student's skip counting and comparison fluency by having them identify patterns. Verbally skip count forward or backward by twos, fives, tens, or even twenties. Start at numbers other than one as well. As you do so, prompt them to identify if you are counting forward or backward, what the pattern is, and how they know. Then, challenge them to continue counting from the spot where you left off.

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# Comparing Numbers With Symbols

## Co-op Activities

### Order Up

Give each student a whiteboard or a piece of scrap paper. Have them select a number from 1–100 to write on their paper. Then, set a timer for one minute. During that minute, have your students work to compare all their numbers and line them up in order from least to greatest. If two students wrote the same number, they should recognize that their numbers are equal and stand in front of one another rather than side by side. At the end of the minute, check to confirm that the line is in the correct order. Then, have your students select new numbers and repeat this process. Consider changing the sorting order from greatest to least as well.

### Comparison Basketball

Give each student two to five pieces of scrap paper. Have them write a number from 1–100 on each piece of scrap paper. Collect the pieces of paper and mix them together in a basket. Have the students form a line. Set two trash cans or baskets in front of them. Label one basket "< 50" and the other basket "> 50." Label a third basket "= 50," but do not set this one out. The student at the front of the line will take a number, read it, decide if it is greater than or less than 50, crumple it into a ball, and throw it into the correct basket. Then, they will go to the back of the line and the next student will take a turn. Repeat this process until all numbers have been sorted. If any cards read "50," discuss with your student where it should go. Encourage them to notice that 50 is neither greater than nor less than 50, but equal to it, and it should go in its own basket or pile.

## Extension Activities

### Comparing Results

Have your student create and issue a survey to at least 10 people. It can be about a topic of their choosing, like their favorite ice cream flavors or favorite type of pet. If necessary, help your student generate data to use in place of surveying different people. Then, encourage your student to find at least three ways to describe their data using comparisons. For example, they might say, "More people liked mint chocolate chip ice cream than strawberry ice cream." Challenge them to use subtraction to make their comparisons even more specific.

### Guess My Number

Take turns playing this game with your student. Write a number on a small piece of paper and keep it a secret. Have your student guess a number and respond to tell them if your number is greater than or less than their guess. For example, if your number is 51 and they guess 72, tell them it is *less than*. Have your student continue guessing by following your clues until they are able to guess your number. Then, switch roles.

## Answer Key

### Take a Closer Look *(Are There More?)*

Discussion responses will vary. Possible answer: There are two boys and four girls. Four is greater than two because two comes first when counting.

### Explore

Discussion responses will vary. Your student may notice that 13 has a 1 in the tens place, but 35 has a 3, making it larger.

### In the Real World *(Different Eggs)*

Discussion responses will vary. Your student may note that they would be eating more if they had two chicken eggs since they are larger than quail eggs.

### Write *(Explain how you can use place value to compare the numbers 45 and 71.)*

Answers will vary. Possible answer: 45 has a 4 in the tens place, and 71 has a 7. 7 is greater than 4, so 71 is greater than 45.

### Write *(Is it true that 68 < 54? Use place value to explain how you know.)*

Answers will vary. Possible answer: It is not true that 68 < 54. 68 has 6 tens, and 54 has 5. 6 is more than 5. That means 68 > 54.

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# Comparing Numbers With Symbols

**Practice** ***(Comparison Symbols)***

Answers will vary as numbers 1, 2, and 4 can be answered with multiple different numbers. Possible answers:

**1.** 24

**2.** 50

**3.** 16

**4.** 30

**Write** ***(Number Arrangement)***

The first and last number will be switched. 7, 4, 3. Answers will vary. Possible answer: The number in the middle will still be the same.

**Practice** ***(Comparing and Ordering)***

**1.** greater-than (symbol)

**2.** less-than (symbol)

**3.** equal sign

**4.** 5, 6, 9, 13, 16

**5.** 1, 7, 12, 14, 20

**6.** Drawn responses will vary, but should show place value for each number in the comparisons. Your student may also circle the difference between these numbers, such as indicating which has more tens. Check that drawings show the following amounts of tens and ones: 19 has 1 ten and 9 ones, 6 has 6 ones, 42 has 4 tens and 2 ones, 65 has 6 tens and 5 ones, 24 has 2 tens and 4 ones, 32 has 3 tens and 2 ones, 23 has 2 tens and 3 ones

**Skill Builder** ***(Operations and Algebraic Thinking)***

**1.** =

**2.** >

**3.** >

**4.** <

**Skill Builder** ***(Measurement and Data)***

**1.** pretzels

**2.** grapes

**3.** Answers will vary. Possible answers: carrots, pretzels, crackers

**4.** Answers will vary. Possible answers: crackers, grapes, carrots

**Show What You Know**

**1.** True

**2.** False

**3.** False

**4.** True

**5.** False

**6.** <

**7.** >

**8.** =

**9.** <

**10.** C

**11.** 1, 3, 4, 7, 10, 14, 16, 20

**12.** Answers will vary. Possible answer: 54 and 51 both have 5 tens, so I need to look at the ones place. 54 has 4 ones and 51 has 1. 4 is greater than 1, so 54 > 51.

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