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Comparing and Ordering Decimals

In this video lesson, you'll find out how you can look at any two decimals and immediately tell which is greater than the other. You'll also learn how to quickly sort decimals from least to greatest or vice versa.

Decimals

Before we talk about comparing and ordering decimals, let's cover some definitions. A **decimal number** is defined as a number that has a decimal point in it. A **decimal point** is a point or dot used to show the beginning of digits that are smaller than 1. Decimal numbers are another way to represent fractions.

For example, the decimal number 21.5 is another way of saying 21 1/2. The decimal point is placed before the 5 to separate the 21 (the whole number) from the .5 (the fraction). The point shows that the 5 is smaller than, or just a fraction of, the whole number 1. We know that 0.5 is actually half of 1. The same is true of the decimal 3.14. The number after the decimal, 0.14, is smaller than 1.

Using Decimals to Count

We count decimals in a similar manner to regular numbers. For regular numbers, we start with 1, then 2, then 3, then 4, etc. As the numbers get bigger, the numbers also get longer. For example, 201 is bigger than 31. This is the way we count for the part of the decimal number that is to the left of the decimal point (the whole part of the number). But once we reach the number to the right of the decimal point (the fraction part of the number), the way we count changes a bit.

I want you to stop for a moment and think about how we alphabetize names. Picture a filing cabinet with a drawer open. What do you see? I have a filing cabinet in my office, and the way I alphabetize is by the first letter, followed by the second letter, and so on and so forth. Each successive letter in a word helps me to get even more detailed in my filing.

A folder called 'BOY' is more specific than something called 'BO,' and I can file it after 'BO' but before 'BP.' Counting decimals is similar. The first digit after the decimal point is like our first letter. The second digit after the decimal point is like our second letter.

Similar to the alphabet, we can count with just our first digit after the decimal point or we can get even more detailed. Just like we can say A, B, C, D, E, F, G, and so on, we can count with just the first digit after the decimal point like this:

0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9

Just like we can get more specific when alphabetizing by filing things by AA, AB, AC, AD, AE, AF, AG, and so on, we can count with another digit to be more even specific, like this:

0.11, 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19

I stopped counting when the last digit reached 9 because at this point, something unique happens to decimal numbers. For regular numbers, what happens after you reach 9 or 19? Why, the digit to the left increases by 1, and your 9 changes to a 0. The 9 becomes a 10 or the 19 becomes a 20. And then you keep counting by increasing your last digit by ones again. For decimal numbers, when you reach 0.9 or 0.19, what you do is you also increase the digit to the left of the 9 by 1. Your decimal point stays put. So the 0.9 becomes a 1.0 and the 0.19 becomes a 0.20.

Unless the problem tells you otherwise, we don't write zeroes at the ends of decimals. So the 1.0 will be written as 1 and the 0.20 will be written as 0.2. You can compare this to alphabetizing. With alphabetizing, when you reach 'BZ,' you roll over to 'C.' After the 'C,' you can start getting specific again, with 'CA,' 'CB,' and so on.

If we continue counting from the 0.9, we would get 1, then 1.1, then 1.2, and so on, until we reach 1.9. When we reach this point, we increase our digit to the left of the 9 by 1 to get 2. Then, we will continue again at 2.1 and so on. If we continue counting from the 0.19, we would get 0.2, then 0.21, then 0.22, and so on. When we reach 0.29, we would go to 0.3 and then continue to 0.31 and so on.

Comparing Two Decimals

To compare two decimals to each other to see which is greater, think about alphabetizing again. If you were going to file two different folders, one called 'T' and the other called 'BEACH,' which one would you put in front? You would file the folder called 'T' in the back and the one called 'BEACH' in the front because the 'T' is bigger than the 'B' and therefore goes in the back. When alphabetizing, you look at the first letter, then the second, and so on. If the first letter is bigger, then it goes behind the other folder no matter how large of a word the other folder has.

So, just like with alphabetizing and looking at the first letter, then the next, and so on, you do the same with decimal numbers. You look at the first digit after the decimal point, then the next, and so on. If the first digit after the decimal point is bigger, then that number is automatically bigger no matter how long the other decimal is.

If the first digit to the right of the decimal point is the same, then you look at the digit after that. For example, 0.8 is bigger than 0.5 and even 0.3401 - even though 0.3401 has four digits instead of just one. This is where decimal numbers differ from regular numbers. In regular numbers, 3,401 would definitely be bigger than 8. Remember this distinction. Think of alphabetizing. Just like 'AB' comes before 'AC,' so 0.34 comes before 0.35. And just like 'APPLE' comes before 'APY,' 0.56879 comes before 0.569.

Ordering Decimals

Now that you know about counting and comparing decimals, you can use both of these skills to put decimal numbers in order. If you were given a bunch of decimals like these, you would use what you have just learned to order them from least to greatest.

0.432, 1.34, 2.1, 5.312, 0.89, 0.7

You can think about alphabetizing and compare each number. Look at the first digit to the right of the decimal point. If that first digit is the same in two different decimal numbers, then you would look at the digit after that to see which one is greater.

Looking at the first two numbers, 0.432 and 1.34, I see right away that 1.34 is bigger than 0.432 because 1 is bigger than 0. These are the numbers before the decimal, so I use the rule of regular numbers. The third number is 2.1, and this is bigger than 1.34, so I put that in third place. 5.312 is next, and that one is in fourth place because the 5 is bigger than the 2. The next one is 0.89, and that one is less than 1.34, but is it bigger than 0.432?

I look at the first digit to the right of the decimal point and I see a 4 in the one and an 8 in the other. Okay. The 8 is bigger, so the 0.89 goes after the 0.432 and before the 1.34. Now what about the 0.7? Where does that one go? Well, I think about alphabetizing and I see that 0.7 is between 0.89 and 0.432, so I will place it there. So, my final ordering from smallest to largest is 0.432, 0.7, 0.89, 1.34, 2.1, and 5.312.

Lesson Summary

So what did we learn? We recalled that **decimal numbers** are numbers with a decimal point. And a **decimal point** is just a dot that is placed before the digits that tells you about the fraction part of the number - the numbers smaller than 1. For example, 0.5 is smaller than 1. In the decimal number 3.14, the 0.14 is smaller than 1.

Counting decimal numbers is similar to counting regular numbers until you get to the decimal point. When you get to the decimal point, you count like you would when alphabetizing. You go from 0.39 to 0.4 the same way you would go from 'TZ' to 'U.'

When comparing and ordering decimal numbers, you start by comparing the first digit immediately after the decimal point to see which is bigger. If those two are the same, you compare the next digits. If those two are the same, then you move on and compare the next digits. This is similar to alphabetizing, such as when you are comparing 'CAT' to 'CAR.' When you order decimal numbers, you use the skills you learned from counting and comparing decimals to place all the decimals in order.

Learning Outcomes

After you have completed this lesson, you should be able to:

- Recognize decimal numbers
- Count decimal numbers
- Compare and order decimal numbers