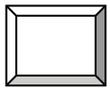
It's time to put your explorer's hat on again because we are going to head into new places. In the last lesson you learned that the ONES, TENS, and HUNDREDS each have a special **place** in our number system. Today we are going to explore the place of the ONES and the HUNDREDS.

Have you ever seen a train go by that has container cars? The containers are used to ship goods all across the country. This picture shows flat train cars with containers stacked on them. The containers keep the goods separated and in one place.

We can use pictures of container boxes to help us see the places that the ONES and TENS hold in our number system.



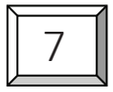
Think back to how you laid out the sticks to show the numbers from 1 through 1000. Sometimes you used bigger bundles of 100, sometimes you used smaller bundles of 10, and sometimes you used the sticks one-by-one. You used three ways of grouping the sticks: hundreds, tens, and ones.

To show those different groupings, we use separate "box cars." The ONES box car only holds ONES. The TENS box car only holds TENS. When we want to show a number, we can move the numerals into place to show how many are in each box.

Let's explore how this works. Your teacher will give you some sticks. Each stick shows us how many? Yes, ONE. Put the sticks down in front of you, counting them out one-by-one. How many do you have? Yes,

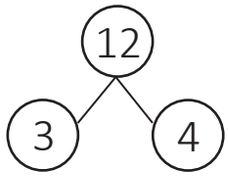
seven. The seven sticks show that you have seven ONES.

We can use a picture of the container box to show these ONES and "keep" them together in one **place**.

Can you see that the seven ONES are in the ONES place? 

When you see a single numeral by itself, such as the numeral 7, it is actually showing you that there are seven ONES. The only difference is that we don't bother to draw the container box around it. We are using the boxes to help us see the "place" that the ONES hold in our number system.

The idea is the same as when we used the number bonds to show the multiplication and division facts. We used the number bonds at first to help you see how the numbers are "connected" to one another. After a while, we didn't have to draw the circles and lines. We used the short-cut of numerals and signs instead.



3 x 4 = 12

12 ÷ 4 = 3

As we are exploring the "places" that the numbers hold in our number system, we will use the "box car" shapes to help you see the places and how the numbers can be hooked together in a "train" of numerals. We call each of the numerals used to write a number a **digit**.

To show the number twelve, for example, we can use the numeral symbol 12. We write the digit **1** and the digit **2** to form the numeral that symbolizes twelve objects.

Let's try another bunch of sticks. Put the sticks your teacher gives you down in front of you, counting them out one-by-one. How many do you have?

Yes, seventeen. The seventeen sticks show that you have seventeen ONES.

Our number system that is based on our ten fingers uses **multiples of ten** to make it easier to work with larger numbers as you saw in the last unit. What can we do to make it easier to work with these seventeen sticks?

If you said put them into as many bundles of ten as we can make, then pat yourself on the shoulder for having the right answer. How many bundles of TEN can you make? STOP

Yes, one bundle of TEN. Go ahead and put the ten sticks on top of each other and put a rubber band around the bundle of TEN. Put the bundle to the left of the single sticks. Do you have enough single sticks left to make another bundle of TEN?

No, the seven sticks are left over. Using the shapes we used to show the new numbers you learned in the last unit, the sticks should now look something like this:

Can you see that you have one bundle of TEN and seven ONES?

We can now use the box car pictures to show how many ONES and TENS we have. Remember, each way we put the sticks together has to have their one place. We can only put the ONES in the ONES box car and the TENS in the TENS box car.

TENS ONES

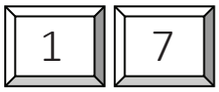
How many ONES do we have? They are shown by the single sticks. Yes, 7. So let's put those seven ONES in their place.

TENS ONES

How many bundles of TENS do we have? Yes, 1. So let's put that one bundle of TEN in the TENS place.

TENS ONES

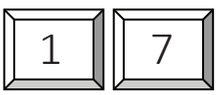
Now we can hook our two box cars together to show how many sticks we have altogether.



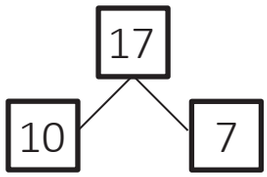
TENS ONES

With the numerals in place, we can see that we have one bundle of TEN, which is equal to 10, and we have seven ONES left over, which equals 7. 10 + 7 = **17**. How many sticks did you have when you first counted them one-by-one? Yes, **17**.

Can you see how all these pictures show us the same number? They help us see the number **seventeen** in a different way?



TENS ONES



10 + 7 = 17
17 – 10 = 7

17

The first picture with the box cars helps us see the number as part of our number system. It shows how many TENS and ONES there are in seventeen. The numeral 1 in the TENS box shows us the "value" of the TENS. It shows us how many TENS there are. The numeral 7 in the ONES box shows us the "value" of the ONES. It shows how many ONES there are.

The idea is the same as a nickel showing you the amount of cents you have. The nickel has a "value" of five cents, which is written as 5¢.

The second picture shows us one of the addition bonds for the number seventeen. It shows us that 10 + 7 = 17. It also shows us one of the

subtraction bonds for the number seventeen. It shows us 17 – 10 = 7. We used the number bonds to show you how the numbers are connected to one another. Once you understood how addition and subtraction worked, you found it easier to work with the short-cut of the number sentences.

The last picture is not really a picture at all. It is a symbol. It is the numeral we write to show the number seventeen. To write that number we use two digits: the digit 1 and the digit 7. It's easier to write the numeral than the box car picture. So why are we bothering with the box cars?

Because they show you exactly what the numeral symbol stands for. The digit 7 on the right shows the value of the ONES. It stands for the seven single sticks you had left over. It shows you that there weren't enough single sticks left to make another bundle of TEN.

1**7**

The digit 1 on the left shows the value of the TENS. It stands for the one bundle of TEN that you were able to make.

17

So now when you see the symbol that stands for seventeen objects, the numeral 17, you can picture the value of each digit in the number: one bundle of TENS and seven ONES. Can you see how the numerals you have been using all along, in this case **17**, show the "values" of each digit in the number seventeen?