

Lesson 3: Digits to the Left and Right

☐ Getting Started

What would you like 10 times more of? For example, if a friend gave you one dollar, would you prefer to have ten dollars? Or would you like to have 10 times more minutes to play video games or read or be with friends?

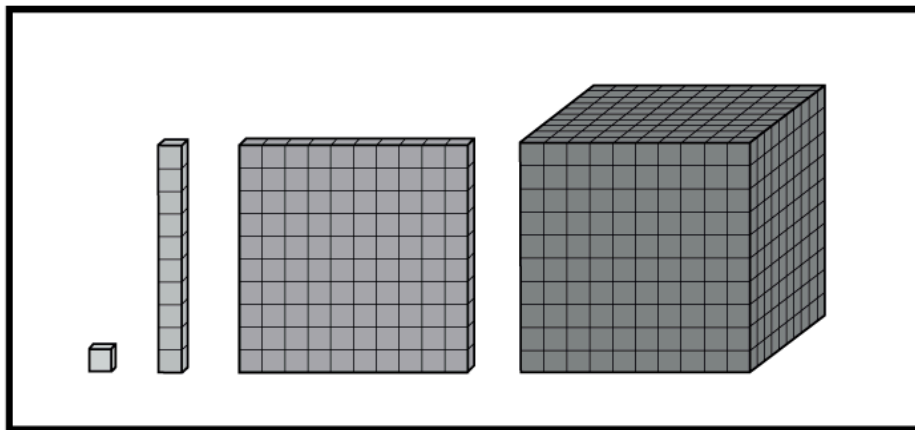
Is there anything you'd like $\frac{1}{10}$ of? For example, would you like $\frac{1}{10}$ the amount of schoolwork or $\frac{1}{10}$ the number of chores? Keep in mind that a fraction is less than a whole. So having $\frac{1}{10}$ of your chores would mean having fewer chores.

When we're very young, we're taught to count by ones, but often, it's faster to count by tens, and because our number system is based on the number ten, counting by tens is easy.

Think about these numbers, what they mean, and how they compare to one another. For example, how does 2 compare to 20? And how does 200,000 compare to 2,000,000?

2 20 200 2,000 20,000 200,000 2,000,000

When you first learned about place value, you probably worked with base-ten blocks. These blocks include unit blocks, ten rods, hundred flats, and thousand cubes. You probably remember that 10 unit blocks equal 1 ten rod, that 10 ten rods equal 1 hundred flat, and that 10 hundred flats equal 1 thousand cube.



During this lesson, you're going to extend your understanding of basic place value to explore patterns when moving from one place value to another, going either left or right.

Stuff You Need

- calculator
- Interactive Notebook

Ideas to Think About

- How does place value work?
- How do you read and write decimal numbers?

Things to Know

- **Decimal number:** a number that has a decimal point
- **Decimal point:** the most important part of a decimal number that shows where numbers begin getting larger than 1 (to the left of the decimal point) and where they begin getting smaller than 1 (to the right of the decimal point)
- The digits to the left of the decimal point are whole numbers.
- The digit to the right of a decimal point is in the tenths place, and the digit to the right of the tenths place is in the hundredths place.
- A digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left.

Activities☐ **Activity 1: Working With Whole Numbers**

Read the information and answer the questions on the "Digit Values" sheets. When you get to the second sheet, remember that a fraction is just another way to show division. So, $1/10$ means "1 divided into 10 pieces" or "1 divided by 10." When you've finished reading both sheets, you can store them in your Interactive Notebook.

☐ **Activity 2: Working With Decimals**

Watch the video at the following web link to review some basic information about decimal numbers.

**Working with Decimals**

www.beyondthepage.com/link/8581/

Next, visit the following web link and practice multiplying and dividing decimals by 10.



Multiply and Divide Decimals by 10
www.beyondthepage.com/link/12357/

You're going to practice multiplying and dividing by 10 (finding $1/10$ of a number) on the "Values Left and Right" sheet. Keep in mind that when you multiply by 10, numbers get greater, and when you divide by 10, numbers get smaller.

Wrapping Up

During this lesson, you began looking at decimal numbers and how they fit into our overall place value system. During the next lesson, you'll dive more deeply into decimals and extend what you already know about them.

Learning Gates

Take the [Learning Gates quiz](#) for this lesson.

Digit Values

Each place value is 10 times the place to its right. So values get **GREATER** as we move to the left...

A ten is 10 times a one.

$$1 \times 10 = 10$$

A hundred is 10 times a ten.

$$10 \times 10 = 100$$

A thousand is 10 times a hundred.

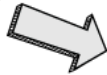
$$100 \times 10 = 1,000$$

A ten thousand is 10 times a thousand

$$1,000 \times 10 = 10,000$$

...and so on!

Try this!
Using a calculator,
solve these problems.



$$3 \times 10 = \underline{\hspace{2cm}}$$

$$30 \times 10 = \underline{\hspace{2cm}}$$

$$300 \times 10 = \underline{\hspace{2cm}}$$

$$3,000 \times 10 = \underline{\hspace{2cm}}$$

$$30,000 \times 10 = \underline{\hspace{2cm}}$$



What happens each time you multiply by 10? _____

In 451,603, the digit 1 represents 1 thousand or 1,000.
In 315,902, the digit 1 represents 1 ten thousand or 10,000.

What does the digit 2 represent in each of these numbers? Write the values in two ways.

342,560 _____

428,901 _____

Remember: A fraction is just another way to write a division problem.

$\frac{1}{10}$ is the same as 1 divided by 10. So, $\frac{1}{10}$ of 100 is the same as $100 \div 10$!

Imagine you have ten dimes.



How many cents is this? _____

What is $\frac{1}{10}$ of this group of dimes? _____ How many cents is this? _____

So, $100 \div 10 = 10$!

Each place value is $\frac{1}{10}$ of the place to its left. So values get **SMALLER** as we move to the right...

$$1,000,000 \div 10 = 100,000$$

$$100,000 \div 10 = 10,000$$

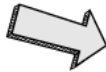
$$10,000 \div 10 = 1,000$$

$$1,000 \div 10 = 100$$

$$100 \div 10 = 10$$

What's happening to the numbers? _____

Try this!
Use what you know to
solve these problems.



$$400,000 \div 10 = \underline{\hspace{2cm}}$$

$$40,000 \div 10 = \underline{\hspace{2cm}}$$

$$4,000 \div 10 = \underline{\hspace{2cm}}$$

$$400 \div 10 = \underline{\hspace{2cm}}$$

Think About It! If you REALLY love jellybeans, would you rather have 400 jellybeans OR $\frac{1}{10}$ of 40,000 jellybeans? Why? _____

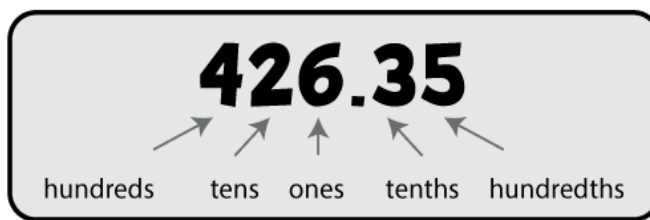
Sandy took 13,000 steps in one day. Mitchell took $\frac{1}{10}$ of 130,000 steps in the same day. Who took more steps that day? _____

Values Left and Right

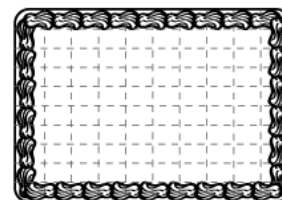
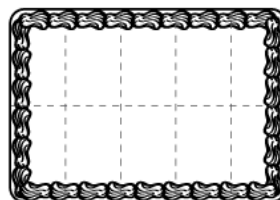
As we move to the  **LEFT**, each place value position gets .

As we move to the  **RIGHT**, each place value position gets .

This is true with both **WHOLE NUMBERS** and **DECIMALS**.



Would you rather have
one-tenth ($\frac{1}{10}$) of a cake
or one-hundredth ($\frac{1}{100}$)
of a cake? _____



Instructions: Multiply and divide as directed. Use the tool on the web page as needed.

Example 1: $6,000 \div 10 = 600$

Example 2: $5.4 \times 10 = 54$

Example 3: $1.2 \div 10 = 0.12$

$500 \times 10 = \underline{\hspace{2cm}}$

$200,000 \times 10 = \underline{\hspace{2cm}}$

$500 \div 10 = \underline{\hspace{2cm}}$

$200,000 \div 10 = \underline{\hspace{2cm}}$

$6.5 \times 10 = \underline{\hspace{2cm}}$

$0.7 \times 10 = \underline{\hspace{2cm}}$

$6.5 \div 10 = \underline{\hspace{2cm}}$

$0.7 \div 10 = \underline{\hspace{2cm}}$

Instructions: Fill in the blanks.

_____ is 10 times as much as 20.

_____ is $\frac{1}{10}$ of 500.

_____ is 10 times as much as 4.5.

_____ is $\frac{1}{10}$ of 34.5.

Lesson 3: Digits to the Left and Right

Getting Started

? Ideas to Think About

- How does place value work?
- How do you read and write decimal numbers?



Things to Know

- **Decimal number:** a number that has a decimal point
- **Decimal point:** the most important part of a decimal number that shows where numbers begin getting larger than 1 (to the left of the decimal point) and where they begin getting smaller than 1 (to the right of the decimal point)
- The digits to the left of the decimal point are whole numbers.
- The digit to the right of a decimal point is in the tenths place, and the digit to the right of the tenths place is in the hundredths place.
- A digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

⦿ Skills

- Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left

Introducing the Lesson

As your child builds his mastery of large numbers and decimals, it's critical that he understands that a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. For example, 200 is 10 times 20, and 200 is 1/10 of 2,000. Your child will work on solidifying his understanding during this lesson and will use this understanding in subsequent lessons. This lesson briefly reviews decimal numbers, focusing on moving the decimal point when multiplying or dividing by 10. Your child will review decimals more thoroughly during Lesson 4.

Activities

Activity 1: Working With Whole Numbers

During this activity, your child will read information and answer questions to solidify his understanding of how values change when we move left and right in whole numbers. He'll review that a fraction is another way to write a division sentence. So, 1/10 means "1 divided into 10 pieces" or "1 divided by 10."

Answer Key:

- $3 \times 10 = (30)$
- $30 \times 10 = (300)$
- $300 \times 10 = (3,000)$
- $3,000 \times 10 = (30,000)$
- $30,000 \times 10 = (300,000)$

- What happens each time you multiply by 10? (the number gets 10 times greater/another 0 is added to the end of the number)
- 342,560 — two thousands, 2,000, or (2×100)
- 428,901 — two ten thousands, 20,000, or $(2 \times 10,000)$
- How many cents is this? (100 cents)
- What is $\frac{1}{10}$ of this group of dimes? (one dime) How many cents is this? (10 cents)
- $400,000 \div 10 = (40,000)$
- $40,000 \div 10 = (4,000)$
- $4,000 \div 10 = (400)$
- $400 \div 10 = (40)$
- Think About It! If you REALLY love jellybeans, would you rather have 400 jellybeans OR $\frac{1}{10}$ of 40,000 jellybeans? Why? ($\frac{1}{10}$ of 40,000 because that equals 4,000 jellybeans)
- Sandy took 13,000 steps in one day. Mitchell took $\frac{1}{10}$ of 130,000 steps in the same day. Who took more steps that day? (neither, they both took 13,000 steps)

Activity 2: Working With Decimals

Now, your child will extend his understanding of how place values change moving left and right to working with decimal numbers to the hundredths. He will begin by watching a video about decimal numbers and then review decimals using an interactive online tool. As he works on this activity, he should keep in mind that when he multiplies by 10, numbers get greater, and when he divides by 10 (finds $\frac{1}{10}$ of a number), numbers get smaller. He should also note how decimal points move when we multiply by 10 (point moves to the right) and divide by 10 (point moves to the left). He can use the website provided to review the basics of decimals and use the interactive tool to help him solve the problems on the activity page as needed.

"Values Left and Right" Answer Key

As we move to the **LEFT**, each place value position gets **bigger, greater**

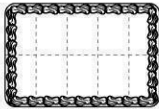
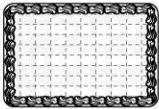
As we move to the **RIGHT**, each place value position gets **smaller, less**

This is true with both **WHOLE NUMBERS** and **DECIMALS**.



Would you rather have one-tenth ($\frac{1}{10}$) of a cake or one-hundredth ($\frac{1}{100}$) of a cake?

$\frac{1}{10}$

Instructions: Multiply and divide as directed. Use the tool on the web page as needed.

$500 \times 10 = 5,000$	$200,000 \times 10 = 2,000,000$
$500 \div 10 = 50$	$200,000 \div 10 = 20,000$
$6.5 \times 10 = 65$	$0.7 \times 10 = 7$
$6.5 \div 10 = 0.65$	$0.7 \div 10 = 0.07$

Instructions: Fill in the blanks.

<u>200</u> is 10 times as much as 20.	<u>50</u> is $\frac{1}{10}$ of 500.
<u>45</u> is 10 times as much as 4.5.	<u>3.45</u> is $\frac{1}{10}$ of 34.5.

Wrapping Up**Questions to Discuss**

- In terms of value, how much more is the hundreds place than the tens place? (10 times more)
- In terms of value, how much less is the hundredths place than the tenths place? ($\frac{1}{10}$ less)
- What happens to the decimal point when you multiply by 10? (it moves to the right)
- What happens to the decimal point when you divide by 10 or find one-tenth of a decimal number? (it moves to the left)
- When might it be important in the real world to understand the values of digits in different places? (examples include buying something expensive, comparing batting averages or other sports statistics, reading nutritional information)

Things to Review

Review that a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left