G4 Playlist: Understanding Place Value

Aligns with *CCSS.MATH.CONTENT.4.NBT.A.1*: Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.

Related Standards

- CCSS.MATH.CONTENT.2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
    - CCSS.MATH.CONTENT.2.NBT.A.1.A: 100 can be thought of as a bundle of ten tens — called a "hundred."
    - CCSS.MATH.CONTENT.2.NBT.A.1.B: The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
- CCSS.MATH.CONTENT.4.NBT.A.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- CCSS.MATH.CONTENT.4.NBT.A.3: Use place value understanding to round multi-digit whole numbers to any place.
- CCSS.MATH.CONTENT.5.NBT.A.1: 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.
- CCSS.MATH.CONTENT.5.NBT.A.2: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Objectives

In this module, you will learn and practice the following skills:

- Understand the relationship between a digit's position in a number and its value.
- Compare the values of digits in different places.
- Multiply and divide numbers by powers of 10 and explain the result.

Let's get started!

Key Terms

- **Place value** is the value of a digit, based on its position in a number.

Welcome

Letters can be arranged in different ways to create words with different meanings. For example, WAS and SAW use the same three letters, but since the letters are in different places in each word, the words have different meanings.

Similarly, the digits 1, 2, 3, 4, 5, 6, 7, 8, and 9 can be arranged in different ways to create numbers with different values. The value of each digit depends on its position in the number.

What is the value of the 2 in the number 427?

In order to work with numbers correctly, you will need to understand place value.

Watch!

For a quick overview of place value, watch this video:

- https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-place-value-rounding/cc-4th-place-value-intro/v/place-value-1

Focus: Place-Value Charts and Base-Ten Block

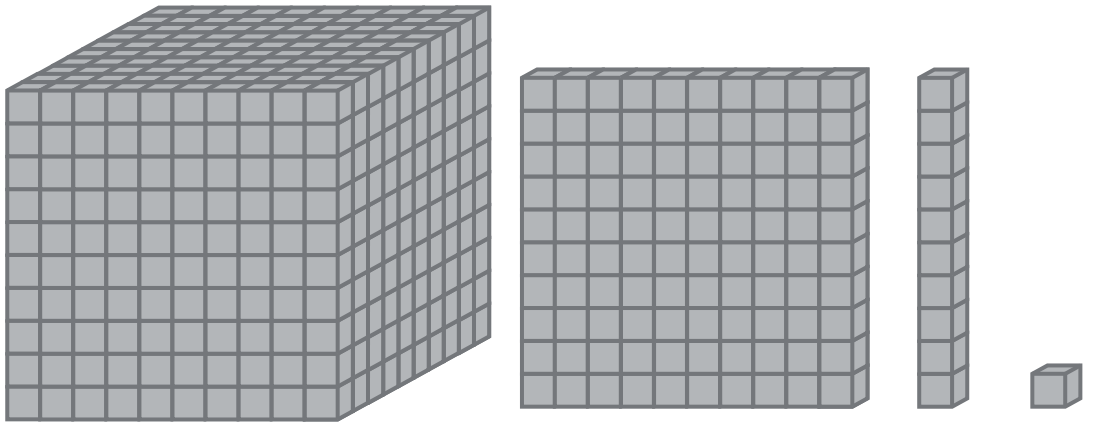
You can use place-value charts and base-ten blocks to represents numbers and help you understand place value.

In a place-value chart, each column is labeled with the value of the place. Fill in the chart with the digits of the number from right to left to find the value of each digit.

The number 427 is written in the chart below.

Thousands	Hundreds	Tens	Ones
	4	2	7

Base-ten blocks use unit cubes to represent the values of digits in different places.



Block (1,000) Flat (100) Rod (10) Unit (1)

The number 427 would be represented with 4 flats, 2 rods, and 7 units.

Answers

The 2 has a value of 20 because it is in the tens place.

Watch!

For a quick overview of place-value charts and base-ten blocks, watch this video:

- https://www.youtube.com/watch?v=1oxAeboVP68

How can you use your understanding of place value to compare the values of digits in multi-digit numbers?

Explore

Place value is the value of a digit, based on its position in a number. Each place in a number has a value 10 times greater than the place to its right.

Compare the values of the two 8s in the number 1,842,895.

Write the number in a place-value chart.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	8	4	2	8	9	5

The first 8 from the left is in the hundred thousands place. It has a value of 800,000.

The second 8 from the left is in the tens place. It has a value of 800.

The value of the first 8 is 1,000 times greater than the value of the second 8.

When you multiply a number by 10, the value of each digit increases by a factor of 10, so each digit moves one place to the left.

Multiply: 230 × 10

230 = 2 hundreds + 3 tens + 0 ones

2300 × 10 = 2 thousands + 3 hundreds = 2,300

	Thousands	Hundreds	Tens	Ones
230		2	3	0
230 × 10	2	3	0	0

When you divide a number by 10, the value of each digit decreases by a factor of 10, so each digit moves one place to the right.

Divide: 458,000 ÷ 100

458,000 = 4 hundred thousands, 5 ten thousands, 8 thousands

458,000 ÷ 100 = 4 thousands, 5 hundreds, 8 tens = 4,580

	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
458,000	4	5	8	0	0	0
458,000 ÷ 100			4	5	8	0

Watch!

For more information about place value, watch these videos:

- https://www.youtube.com/watch?v=dXCa9_eK3Ys
- https://www.youtube.com/watch?v=etvngj812Cg

Practice!

You can practice place value by completing these activities:

- https://www.khanacademy.org/math/pre-algebra/order-of-operations/place_value/e/understanding-place-value-1
- http://mrnussbaum.com/grade_4_standards/converting/
- http://mrnussbaum.com/grade_4_standards/columns/