Lesson 2.1 Understanding Place Value to Millions

Write the value of the
underlined digit.
2,3<u>2</u>5,976

The value of the 2 is 2 ten
thousands, or 20,000.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	3	2	5	9	7	6

Write the numerical value of the digit in the place named.

	a	b	c	d
1.	5,363,246 millions _____5,000,000_____	952,418 ten thousands _____	4,510,367 tens _____	8,123,405 ones _____
2.	9,867,823 hundred thousands _____	567,345 thousands _____	1,328,976 millions _____	5,004,002 thousands _____
3.	2,982,023 thousands _____	345,632 ten thousands _____	6,543,211 millions _____	2,566,900 hundred thousands _____

Name the place of the underlined digit.

	a	b
4.	2,<u>5</u>64,740	<u>3</u>,297,134
	___ is in the _____ place.	___ is in the _____ place.
5.	8,7<u>6</u>1,089	<u>9</u>,345,187
	___ is in the _____ place.	___ is in the _____ place.
6.	<u>8</u>59,632	<u>4</u>,689,322
	___ is in the _____ place.	___ is in the _____ place.

Lesson 2.2 Understanding Place Value with Decimals

In 1,324.973 what place value is the 9?

thousands	hundreds	tens	ones	tenths	hundredths	thousandths
1	3	2	4 .	9	7	3

The 9 can be named nine tenths, $\frac{9}{10}$, or 0.9.

Write the place value of the given number.

	a	b	c
1.	3 in $10.03	7 in 7,000.2	5 in 13.5
2.	2 in $25.75	4 in 5,238.004	8 in 11.8
3.	1 in $561.07	3 in 0.037	6 in 0.136

Write the digit that is in the given place value.

	a	b	c	d
4.	432.14 hundreds	325.17 tenths	3,214.005 thousandths	25.132 tens
5.	30.146 hundredths	25.523 thousandths	125.043 tenths	1,325 thousands
6.	100.304 tenths	1.325 hundredths	1.005 thousandths	731.045 ones

Lesson 2.3 Powers of Ten

An **exponent** is a number that shows how many times a base number is to be used in multiplication. A **power of ten** is an exponent where the base number is always 10.

$10^1 = 1\underline{0} = 1\underline{0}$
$10^2 = 1\underline{0} \times 1\underline{0} = 1\underline{00}$
$10^3 = 1\underline{0} \times 1\underline{0} \times 1\underline{0} = 1,\underline{000}$
$10^4 = 1\underline{0} \times 1\underline{0} \times 1\underline{0} \times 1\underline{0} = 1\underline{0,000}$

Convert the values below to a power of ten.

	a	b	c
1.	100,000	1,000,000	10
	_____	_____	_____
2.	10,000,000	100	1,000,000,000
	_____	_____	_____

Convert these powers of ten to standard numbers.

	a	b	c
3.	10^7	10^5	10^3
	_____	_____	_____
4.	10^8	10^{12}	10^6
	_____	_____	_____

Lesson 2.4 Patterns of Zeros and Decimals in Products and Quotients

When a number is multiplied or divided by a multiple of 10, the number of zeros and decimals in the product or quotient will vary based on the value of the multiple of 10 that is used.

0.2658×1	=	0.2658		$265,800. \div 1$	=	265,800.0
0.2658×10	=	2.658		$265,800. \div 10$	=	26,580.0
0.2658×100	=	26.58		$265,800. \div 100$	=	2,658.0
$0.2658 \times 1,000$	=	265.8		$265,800. \div 1,000$	=	265.8
$0.2658 \times 10,000$	=	2,658.0		$265,800. \div 10,000$	=	26.58
$0.2658 \times 100,000$	=	26,580.0		$265,800. \div 100,000$	=	2.658
$0.2658 \times 1,000,000$	=	265,800.0		$265,800. \div 1,000,000$	=	0.2658

When a number is multiplied by a power of 10, the decimal in the product moves to the right and zeros are added to the left of the decimal when needed.

When a number is divided by a power of 10, the decimal in the product moves to the left and zeros are added to the right of the decimal when needed.

Multiply by the power of ten to find the product.

	a	b	c
1.	21.48×10	$6.07 \times 1,000$	7.58×100
	_____	_____	_____
2.	$7.434 \times 100,000$	$0.7 \times 1,000$	$0.502 \times 10,000$
	_____	_____	_____

Divide by the power of ten to find the quotient.

3.	$13.4 \div 10$	$27.65 \div 100$	$320.7 \div 10$
	_____	_____	_____
4.	$3.457 \div 100$	$82.93 \div 10$	$726.9 \div 1,000$
	_____	_____	_____

Lesson 2.5 Expanded Form with Whole Numbers

Expanded form is a way to write a number that shows the sum of values of each digit of a number. To use expanded form, a number has to be separated into each of its parts using place value.

$5,423 = 5,000 + 400 + 20 + 3$

$39,572 = 30,000 + 9,000 + 500 + 70 + 2$

Write each number in expanded form.

	a	b
1.	430	721
2.	3,465	43,645
3.	90,327	4,009
4.	653,410	103,254
5.	199,482	32,451
6.	9,342,751	2,500,055
7.	598,721	69,003

Lesson 2.6 Expanded Form with Decimals

Expanded form can also be used with decimals. When a number contains decimal parts, they can be separated in the same way whole number parts can.

$396.636 = 300 + 90 + 6 + 0.6 + 0.03 + 0.006$

$94,524.51 = 90,000 + 4,000 + 500 + 20 + 4 + 0.5 + 0.01$

Write each number in expanded form.

	a	b
1.	268.849	657.254
2.	182.19	9989.52
3.	756.234	332.115
4.	435.461	14.514
5.	2,948.23	69.241
6.	219.833	38,966.3
7.	519.5	971.396

Lesson 2.7 Comparing Decimals

Which is larger: 4.218 or 4.222?

4.2_18   4.2_22

The ones are the same.
The tenths are the same.
The hundredths are different.

4.218 < 4.222
4.218 is less than 4.222.

Compare each pair of decimals using <, >, or =.

	a	**b**	**c**
1.	5.213 _____ 5.312	3.1 _____ 3.10	28.35 _____ 28.251
2.	6.32 _____ 6.032	5.17 _____ 5.172	144.3 _____ 144
3.	7.325 _____ 6.425	3.14 _____ 2.99	48.28 _____ 48.280
4.	0.213 _____ 0.223	1.006 _____ 1.060	0.010 _____ 0.001
5.	0.674 _____ 0.644	3.122 _____ 3.220	43.01 _____ 43.100
6.	2.897 _____ 2.90	0.43 _____ 0.430	0.790 _____ 0.789
7.	.0.571 _____ 0.58	10.462 _____ 100.46	9.36 _____ 9.306
8.	17.110 _____ 17.101	0.182 _____ 1.820	98.999 _____ 99.001
9.	1.090 _____ 1.009	25.224 _____ 25.242	63.12 _____ 63.2
10.	5.703 _____ 5.730	0.479 _____ 4.79	81.40 _____ 81.400

Lesson 2.8 Ordering Decimals

To order a group of decimals, line up the decimal points.

2.14, 2.08, 2.1, and 2.01

2.14
2.08
2.1
2.01

All the ones are the same. 2.14 and 2.1 have the same tenths digit, but 4 is greater than zero. In the other two numbers, 8 is greater than 1.

List from least to greatest:
2.01, 2.08, 2.1, 2.14

Order the decimals from least to greatest.

1. 7.52, 7.498, 7.521, 7.6

_____

2. 0.028, 0.080, 0.082, 0.008

_____

3. 12.193, 12.201, 12.191, 12.200

_____

4. 0.116, 0.108, 0.113, 0.117

_____

5. 22.5, 22.67, 23.8, 23.703

_____

6. 12.249, 12.13, 12.5, 12.2

_____

Lesson 2.9 Rounding to the Nearest Whole Number

Round 15.897 to the nearest whole number.	Round 234.054 to the nearest whole number.
Look at the tenths digit. 15.<u>8</u>97	Look at the tenths digit. 234.<u>0</u>54
8 is greater than or equal to 5, so round 5 to 6 in the ones place.	0 is less than 5, so keep the 4 in the ones place.
16	234

Round each to the nearest whole number.

	a	b	c	d
1.	6.421	5.882	19.235	2.371
2.	45.288	97.5	12.003	72.71
3.	13.936	8.42	1.100	65.39
4.	98.55	269.57	14.369	23.09
5.	95.645	8.67	99.198	51.70
6.	29.98	98.4	33.333	67.67

Lesson 2.10 Rounding Decimals

Round 2.137 to the nearest tenth.	Round 8.447 to the nearest hundredth.
Look at the hundredths digit. 2.1<u>3</u>7	Look at the thousandths digit. 8.44<u>7</u>
3 is less than 5, so keep the 1 in the tenths place.	7 is greater than or equal to 5, so round 4 to 5 in the hundredths place.
2.1	8.45

Round each number to the nearest tenth.

	a	b	c	d
1.	7.322	1.156	3.770	6.923
	_____	_____	_____	_____
2.	7.953	4.438	5.299	8.171
	_____	_____	_____	_____
3.	4.734	5.629	0.138	9.818
	_____	_____	_____	_____

Round each number to the nearest hundredth.

4.	5.872	2.212	6.447	1.735
	_____	_____	_____	_____
5.	4.397	4.442	9.161	3.476
	_____	_____	_____	_____
6.	5.849	4.484	0.987	0.155
	_____	_____	_____	_____