Name_____ Lesson 1.1

Place Value Through Millions

You can use a place-value chart to help you read and write whole numbers and find the value of a digit. A **period** is a group of three digits. The three periods shown in the chart below are ones, hundreds, and **millions**.

Millions Period			Hundreds Period			Ones Period		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
3	0	1	2	5	6	8	7	8

Each period is separated by a comma.

Standard Form: 301,256,878

Expanded Form:

Multiply each digit by its place value to write expanded form.

300,000,000 + 1,000,000 + 200,000 + 50,000 + 6,000 + 800 + 70 + 8

Word Form:

Write the word name for the numbers in each period followed by the name of each period and a comma.

three hundred one million, two hundred fifty-six thousand, eight hundred seventy-eight

To find the value of a underlined digit, multiply the digit by its place value.

In 3̲01,256,878 the digit 3 is equal to 3 × 100,000,000 = 300,000,000.

Write the value of the underlined digit.

1. 2̲34,621,889 _____
2. 34̲7,254,901 _____
3. 3̲8,507 _____
4. 61̲7,008,235 _____
5. 15̲3,709 _____
6. 4̲8,227,304 _____

Write each number in two other forms.

7. 803,154

_____

_____

_____

8. 60,000,000 + 30,000 + 9,000 + 20 + 4

_____

_____

_____

Reteach

Name_____ Lesson 1.2

Compare and Order Whole Numbers

A place-value chart can help you compare whole numbers.

Compare 2,306,821 and 2,310,084. Write <, >, or =.

Millions Period			Thousands Period			Ones Period		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
		2	3	0	6	8	2	1
		2	3	1	0	0	8	4

Compare the digits in the one millions place. $2 = 2$

Compare the digits in the hundred thousands place. $3 = 3$

Compare the digits in the ten thousands place. $0 < 1$

Since 0 ten thousand is less than 1 ten thousand, then, $2{,}306{,}821 < 2{,}310{,}084$

Compare. Write <, >, or = for each ◯.

1. 2,518 ◯ 2,815
2. 130,870 ◯ 130,870
3. 5,266,918 ◯ 5,264,613
4. 525,100 ◯ 625,100
5. 670,430 ◯ 640,470
6. 13,275,104 ◯ 13,276,819
7. 962,338 ◯ 962,338
8. 18,181 ◯ 18,818
9. 72,345,995 ◯ 72,345,795

Name the greatest place-value position where the digits differ.
Name the greater number.

10. 3,218; 3,208 _____ _____
11. 270,908; 270,608 _____ _____
12. 8,306,722; 8,360,272 _____ _____
13. 3,541,320; 3,541,230 _____ _____
14. 324,060; 326,040 _____ _____
15. 12,452,671; 12,543,671 _____ _____

Name _____ Lesson 1.3

Estimate Sums and Differences

You can **estimate** to find an answer that is close to the exact answer.
Use **compatible numbers** to estimate.
Compatible numbers are easy to compute mentally.

Estimate using compatible numbers.

103,883 + 71,852

103,883 → 104,000
+ 71,000 → + 72,000
176,000

Think: 104 + 72 is easy to add mentally, so 104,000 + 72,000 are good compatible numbers to use for an estimate.

Estimate by rounding.

1. 294,322
+ 163,582 +

2. 925,461
− 173,509 −

3. 529,617
− 237,150

4. 72,543
+ 29,583

5. $63,895
+ 37,228

6. 773,645
+ 135,710

7. 745,556
− 132.881

Estimate by using compatible numbers.

8. 47,738
−21,559 −

9. 263,776
+ 613,886 +

10. 223,873
+ 78,905

11. 56,108
+ 42,336

12. $8,423
− 1,825

13. 95,223
+ 103,229

14. 554,903
− 125,318

Reteach

Name _____ Lesson 1.4

Add and Subtract Whole Numbers

You can use a place-value chart to help you add or subtract.

When you add, you find the sum of two or more numbers. When you subtract, you find the difference of two numbers.

Inverse operations are operations that undo each other. The inverse relationship allows you to check addition by using subtraction and to check subtraction by using addition.

	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
		1 7	1 8	9	0	1 3	9
+		3	2	5	1	5	5
	1	1	1	4	1	9	4

Find the sum of 789,039 + 325,155.
Start adding from right to left. Regroup as needed.

First add the ones. Regroup 14 ones as 1 tens and 4 ones.

Then add then tens.

Then add the hundreds.

Add the thousands. Regroup 14 thousands as 1 ten thousands and 4 thousands.

Then add the ten thousands. Regroup 11 ten thousands as 1 hundred thousands and 1 ten thousand. Last add the hundred thousands.

Regroup 11 hundred thousands as 1 millions and 1 hundred thousands.

So, the sum is 1,114,194.

Find each sum or difference.

1. 5,382 + 8,723

2. 33,617 + 29,218

3. 306,657 − 182,322

4. 129,336 + 647,273

5. 259,562 + 487,018 + 241,393

6. 4,678,128 − 2,119,625

7. 319,007 − 227,242

8. 603,438 + 617,634

9. 18,275 + 5,225 + 3,093

10. 2,705,243 − 1,192,013

11. 500,601 − 74,581

Name _____ Lesson 1.5

Problem Solving Workshop Strategy: Work Backward

On Saturdays, Samantha has stretching class for 45 minutes and ballet for an hour and a half. After a 30-minute break, she has jazz class for 1 hour, which is over at 1:45 P.M. At what time does she begin?

Read to Understand

1. What does the problem ask you to find?

_____

Plan

2. What strategy can you use to solve the problem?

_____

_____

Solve

3. Solve the problem. Use the space below to show how you worked backward to solve the problem.

4. Write your answer in a complete sentence.

_____

Check

5. Is there another strategy you could use to solve the problem?

_____

_____

Work backward to solve.

6. The school pep club spent $326 on supplies to decorate the school. They also spent $85 to print banners to put above the bleachers. They now have $183 left in their budget. How much money did they start with in their budget?

_____

7. From 2006 to 2007, the number of students signed up for summer sports increased by 635. From 2007 to 2008 the number increased by 224. In 2008, 1,783 students were signed up for summer sports. How many students were signed up in 2006?

_____

Reteach

Name_____ Lesson 1.6

Multiples and the Least Common Multiple

A **multiple** of a number is the product of that number and any other number.

List the first ten multiples of 9.

To find the first ten multiples, multiply 9 by 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

$9 \times 1 = \mathbf{9}$ $9 \times 2 = \mathbf{18}$ $9 \times 3 = \mathbf{27}$ $9 \times 4 = \mathbf{36}$ $9 \times 5 = \mathbf{45}$

$9 \times 6 = \mathbf{54}$ $9 \times 7 = \mathbf{63}$ $9 \times 8 = \mathbf{72}$ $9 \times 9 = \mathbf{81}$ $9 \times 10 = \mathbf{90}$

So, the first 10 multiples of 9 are 9, 18, 27, 36, 45, 54, 63, 72, 81, and 90.

When a number is a multiple of two or more numbers it is a **common multiple.**

The **least common multiple,** or (LCM), of two or more numbers is the least number that is a multiple of all of the numbers.

Write the least common multiple for 4, 8, and 12.

Multiples of 4:	4	8	12	16	20	(24)	28	32	...
Multiples of 8:	8	16	(24)	32	40	48	56	64	...
Multiples of 12:	12	(24)	36	48	60	72	84	96	...

So, 24 is the least common multiple.

List the first ten multiples of each number.

1. 6

2. 10

_____ _____

_____ _____

Write the least common multiple for each set of numbers.

3. 6 and 7

4. 4, 5, and 10

Name_____ Lesson 1.7

Divisibility

A number is **divisible** by another number if the quotient is a whole number and the remainder is 0.

$24 \div 4 = 6$ ⟵ 24 is divisible by 4.

$24 \div 5 = 4$ R4 ⟵ 24 is not divisible by 5.

Test the following number to see if it is divisible by 2, 3, 5, 6, 9, or 10.

5,675

A number is divisible by 2 if the last number is an even number.
5,675 is not divisible by 2. → 5, 6 7(5) ⟵ odd number

A number is divisible by 3 if the sum of its digits is divisible by 3.
5,675 is not divisible by 3. → 5+6+7+5=(23) ⟵ sum not divisible by 3

A number is divisible by 5 if the last digit is 0 or 5.
5,675 is divisible by 5. → 5, 6 7(5) ⟵ 5

A number is divisible by 6 if is divisible by 2 AND by 3.
5,675 is not divisible by 3, so it is not divisible by 6.

A number is divisible by 9 if the sum of its digits is divisible by 9.
5,675 is not divisible by 9. → 5+6+7+5=(23) ⟵ sum not divisible by 9

A number is divisible by 10 if the last digit is 0. → 5, 6, 7,(5) ⟵ not a 0
5,675 is not divisible by 10.

So, 5,675 is divisible by 5. It is not divisible by 2, 3, 6, 9, or 10.

Test each number to determine whether it is divisible by 2, 3, 5, 6, 9, or 10.

1. 489

2. 364

3. 6,420

4. 8,703

Name_____ Lesson 1.8

Factors and the Greatest Common Factor

A factor is a number multiplied by another number to find a product.

List the factors of 21.

$1 \times 21 = 21$

$3 \times 7 = 21$

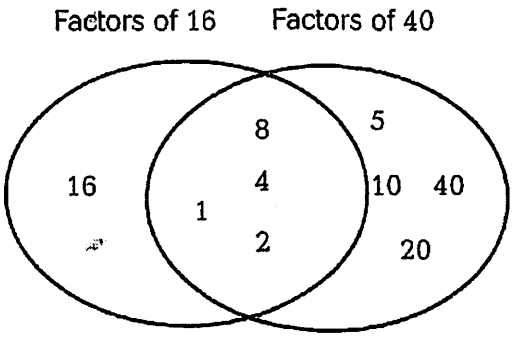
So, the factors of 21 are 1,3,7, and 21.

A **common factor** is a factor that two or more numbers share.

The **greatest common factor**, or GCF, is the greatest factor that two or more numbers have in common.

Write the greatest common factor for 16 and 40.

Use a Venn diagram to find the common factors.



Identify the greatest common factor in the overlap section, which in this case is 8.
So, the greatest common factor of 16 and 40 is 8.

List the factors of each number.

1. 14 _____
2. 27 _____
3. 16 _____
4. 32 _____

Write the common factors for each set of numbers.

5. 21, 30 _____
6. 35, 28 _____
7. 18, 24 _____
8. 45, 15 _____

Write the greatest common factor for each set of numbers.

9. 20, 35 _____
10. 18, 42 _____
11. 30, 35 _____
12. 49, 35 _____

Reteach

Name_____ Lesson 1.9

Find Prime Numbers

A **prime number** is a whole number greater than 1 with exactly two factors, 1 and the number itself.

A **composite number** is a whole number greater than 1 with more than two factors.

You can use division to find the factors of a number and tell whether the number is prime or composite.

Tell whether 55 is prime or composite.

Use division to find all the numbers by which 55 is evenly divisible. Those numbers are the factors of 55.

$55 \div 1 = 55$, so 1 and 55 are factors

$55 \div 5 = 11$, so 5 and 11 are factors

The factors of 55 are 1, 5, 11 and 55.

Since 55 has more than two factors, 55 is a composite number.

Tell whether 61 is prime or composite.

Use division to find all the numbers by which 61 is evenly divisible. Those numbers are the factors of 61.

$61 \div 1 = 61$, so 1 and 61 are factors.

There are no other numbers that divide into 61 evenly.

The factors of 61 are 1 and 61.

Since 61 has only two factors, 61 is a prime number.

Tell whether the number is *prime* or *composite*..

1. 44 _____
2. 31 _____
3. 106 _____
4. 53 _____
5. 240 _____
6. 141 _____
7. 432 _____
8. 67 _____
9. 83 _____
10. 506 _____
11. 759 _____
12. 858 _____

Name _____ Lesson 1-10

Prime and Composite Numbers

A **prime number** has exactly two factors, 1 and itself.

A **composite number** is a number that has more than two factors.

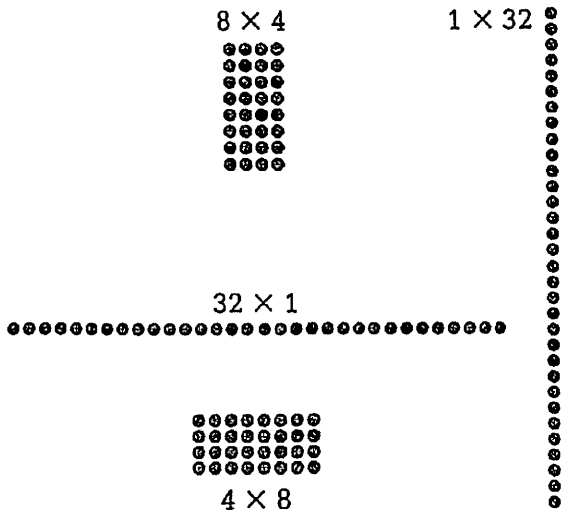
The number 1 is neither prime nor composite.

You can make arrays to find if a number is prime or composite. An *array* is an arrangement of objects in rows and columns. A number with exactly two arrays is prime. A number with more than two arrays is composite.

Write prime or composite.
You may use counters or draw arrays.
32

Draw arrays to represent 32.

- Make an array of 1 row of 32. Label it 1 × 32.
- Make an array with 8 rows of 4. Label it 8 × 4.
- Make an array of 32 rows of 1. Label it. 32 × 1.
- Make an array with 4 rows of 8. Label it 4 × 8.



Since 32 can be represented by more than 2 arrays it is not prime.

So, the number 32 is composite.

Write *prime* or *composite*. You may use counters or draw arrays.

1. 15 _____
2. 19 _____
3. 11 _____
4. 38 _____
5. 45 _____
6. 24 _____
7. 67 _____
8. 44 _____
9. 31 _____

Reteach

Name _____ Lesson 1.11

Introduction to Exponents

The **exponent** is a number that tells how many times another number, the **base**, is used as a factor.

Write in exponent form.
Then find the value.

$10 \times 10 \times 10$

What is the base? 10

How many times is the base being used as a factor? ⟶ 3 times

So, $10 \times 10 \times 10$ written in exponent form is ⟶ 10^3.

What is the value of 10×10? ⟶ 100

What is the value of 100×10? ⟶ 1,000

So, the value of $10^3 = 1{,}000$.

Write in exponent form. Find the value.

1. $10 \times 10 \times 10 \times 10 \times 10$

2. 10×10

3. $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$

4. $10 \times 10 \times 10 \times 10 \times 10 \times 10$

Find the value.

5. 10^4

6. 10^9

7. 10^6

8. 10^8

Reteach

Name_____ Lesson 1.12

Exponents and Square Numbers

You already know that an exponent is a number that tells how many times the base is used as a factor.

In the last lesson, the base was always 10. The base does not always have to be 10, though.

Write $3 \times 3 \times 3 \times 3 \times 3 \times 3$ in exponent form.

3 is the repeated factor, so 3 is the base.

The base is repeated 6 times, so 6 is the exponent.

$3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^6$

3^6 ← exponent

↑

base

A base with an exponent can be written in words.

Write 3^6 in words.

The exponent 6 means "the sixth power."

3^6 in words is "the sixth power of three."

A perfect square or a square number is the product of a number and itself. A square number can be represented with the exponent 2.

There are two ways to write the word form for an exponent of 2 or 3.

Write 4×4 and $6 \times 6 \times 6$ in exponent form and in words.

Exponent form: 4^2
Words: the second power of four
or four squared

Exponent form: 6^3
Words: the third power of six
or six cubed

Write in exponent form and then write in words.

1. $5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$

_____

_____

_____

2. $8 \times 8 \times 8$

_____

_____

_____

3. $2 \times 2 \times 2 \times 2 \times 2$

_____

_____

_____

Find the value.

4. 2^7

_____

5. 12^3

_____

6. 19^2

_____