

Math 7

2018-2019

Unit 1 Extension

Topics:

- Place Value
- Factors and Multiples
- Prime and Composite Numbers
- Greatest Common Factor
- Least Common Multiple



Name: _____

Team: ____ Math Ext Per: ____ Teacher: _____

Lesson 1Ext: *Place Value and Rounding*

Place Value

A place-value chart can help you read and write numbers. The number 345,012,678,912.5784 (three hundred forty-five billion, twelve million, six hundred seventy-eight thousand, nine hundred twelve and five thousand seven hundred eighty-four ten-thousandths) is shown.

Billions	Millions	Thousands	Ones	Tenths	Hundredths	Thousandths	Ten-Thousandths
345,	012,	678,	912	5	7	8	4

Name the place value of the underlined digit.

1. 123,456,789,123.0594
2. 123,456,789,123.0594
3. 123,456,789,123.0594
4. 123,456,789,123.0594
5. 123,456,789,123.0594
6. 123,456,789,123.0594

Rounding

To round to a certain place, follow these steps.

1. Locate the digit in that place, and consider the next digit to the right.
2. If the digit to the right is 5 or greater, round up. Otherwise, round down.
3. Change each digit to the right of the rounding place to zero.

Round 259,345.278 to the place indicated.

7. Hundred thousand
8. Ten thousand
9. Thousand
10. hundred

Lesson 2Ext: Prime & Composite numbers, prime factorization

Factors and Multiples

- When two whole numbers are multiplied to get a third, the two numbers are said to be factors of the third number.
- Multiples of a number can be found by multiplying the number by 1, 2, 3, 4, and so on.

PRACTICE

List all the factors of each number.

1. 8

4. 51

2. 20

5. 16

3. 9

6. 27

Write the first five multiples of each number.

7. 9

10. 15

8. 10

11. 7

9. 20

12. 18

Divisibility Rules

A number is divisible by another number if the division results in a remainder of 0. Some divisibility rules are shown below:

A number is divisible by:	DIVISIBLE	NOT DIVISIBLE
2 if the last digit is an even number		
3 if the sum of the digits is divisible by 3.		
4 if the last TWO digits form a number divisible by 4.		
5 if the last digit is 0 or 5.		
6 if the number is even AND divisible by 3.		
8 if the last THREE digits form a number divisible by 8.		
9 if the sum of the digits is divisible by 9.		
10 if the last digit is 0.		

PRACTICE

Determine which of these numbers each number is divisible by: 2, 3, 4, 5, 6, 8, 9, 10
(list them below)

1. 56 _____
2. 200 _____
3. 75 _____
4. 324 _____
5. 42 _____
6. 812 _____
7. 784 _____
8. 501 _____
9. 2,345 _____
10. 555,555 _____
11. 3009 _____
12. 2001 _____

Prime and Composite Numbers

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

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

PRACTICE

Determine whether each number is prime, composite, or neither.

1. 5 _____

5. 1 _____

9. 72 _____

2. 14 _____

6. 27 _____

10. 49 _____

3. 18 _____

7. 13 _____

11. 9 _____

4. 2 _____

8. 39 _____

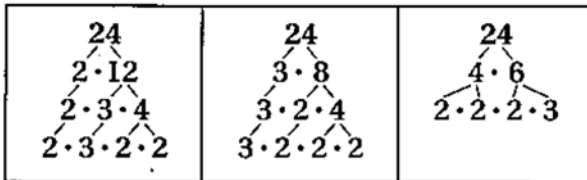
12. 89 _____

Prime Factorization

A composite number can be expressed as a product of prime numbers. This is the **prime factorization** of the number. To find the prime factorization of a number, you can use a factor tree.

EXAMPLE

Find the prime factorization of 24.



The prime factorization of 24 is $2 \cdot 2 \cdot 2 \cdot 3$, or $2^3 \cdot 3$.

PRACTICE

Find the prime factorization of each number.

1. 25

2. 16

3. 56

4. 18

5. 72

6. 40

Lesson 3Ext: *Least Common Multiple & Greatest Common Factor*

Greatest Common Factor (GCF)

The **greatest common factor (GCF)** of two whole numbers is the greatest factor the numbers have in common.

EXAMPLE

Find the GCF of 24 and 60.

Method 1: List all the factors of both numbers.

Find all the common factors.

24: 1, 2, 3, 4, 6, 8, 12, 24

60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

The common factors are 1, 2, 3, 4, 6, and 12.
So the GCF is 12.

Method 2: Find the prime factorizations.

24: $2^3 \cdot 3$

60: $2^2 \cdot 3 \cdot 5$

Find the least power of each common prime factor: 2^2 and 3. The product of these is the GCF.

So the GCF is $2^2 \cdot 3 = 12$.

PRACTICE

Find the GCF of each pair of numbers by either method.

1. 9, 15

2. 25, 75

3. 18, 30

4. 4, 10

5. 12, 17

6. 30, 96

7. 54, 72

8. 15, 20

9. 40, 60

10. 40, 50

11. 14, 21

12. 14, 28

Least Common Multiple (LCM)

The **least common multiple (LCM)** of two whole numbers is the least multiple the numbers share.

EXAMPLE

Find the least common multiple of 8 and 10.

Method 1: List multiples of both numbers.

8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80

10: 10, 20, 30, 40, 50, 60, 70, 80, 90

The smallest common multiple is 40.

So the LCM is 40.

Method 2: Find the prime factorizations.

8: 2^3

10: $2 \cdot 5$

Find the greatest power of each prime factor: 2^3 and 5. The product of these is the LCM.

So the LCM is $2^3 \cdot 5 = 40$.

PRACTICE

Find the LCM of each pair of numbers by either method.

1. 2, 4

2. 3, 15

3. 10, 25

4. 10, 15

5. 3, 7

6. 18, 27

7. 12, 21

8. 9, 21

9. 24, 30

10. 9, 18

11. 16, 24

12. 8, 36