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Name: _____ Date: _____

FACTORING AND PRIME NUMBERS
N-GEN MATH® 6

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When we take a number and write it as a product, it is known as **factoring** the number. There is often more than one way to factor a number.

***Exercise* #1:** Take the whole number 12 and write it as the product (factor it) of two whole numbers in as many ways as you can.

12 = _____ 12 = _____ 12 = _____

When we write a number like 12 in its **factored form**, each part of the product is known as a **factor** of 12. So, the word **factor** is both a verb and a noun.

The Two Meanings of the Word Factor

Factor (verb): To write a whole number as the product of two (or more) other whole numbers.

Factor (noun): Any one of the whole numbers involved in the product.

***Exercise* #2:** Based on your answers to Exercise #1, list all **factors** of the number 12.

***Exercise* #3:** For each of the following numbers, write it as the product of two whole numbers in as many ways as you can. Then, write all factors of each number.

(a) 4 (b) 18 (c) 24

Factorizations of 4: Factorizations of 18: Factorizations of 24:

Factors of 4: Factors of 18: Factors of 24:

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There are special whole numbers when it comes to factoring called **prime numbers**.

***Exercise* #4:** Each of the following is a **prime number**. Write each as a product of two whole numbers in as many ways as possible. Then, write the factors of the prime number.

(a) 2 (b) 3 (c) 5 (d) 7

Factors of 2: Factors of 3: Factors of 5: Factors of 7:

(e) In terms of factoring, what do you notice about **prime numbers**?

PRIME NUMBERS

Prime numbers are whole numbers **greater than 1** that **cannot** be formed from **the product** of **two smaller** whole numbers. Whole numbers that are **not prime** are called **composite.**

***Exercise* #5:** Determine if each of the following numbers is **prime** or **composite** by attempting to factor it as the product of two smaller whole numbers.

(a) 21 (b) 11 (c) 33 (d) 19

Another way to look at **prime numbers** is by considering division.

***Exercise* #6:** If there are 13 cookies (a prime number) at a birthday party, is there any way to divide them up equally amongst a group of friends so that each has a whole number of cookies? Explain your answer.

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Name: _____ Date: _____

FACTORING AND PRIME NUMBERS
N-GEN MATH® 6 HOMEWORK

FLUENCY

1. For each of the following numbers, write it as the product of two whole numbers as many ways as you can. Then, write all the factors of that whole number.

(a) 10	(b) 40	(c) 28
Factorizations of 10:	Factorizations of 40:	Factorizations of 28:
Factors of 10:	Factors of 40:	Factors of 28:
(d) 32	(e) 25	(f) 48
Factorizations of 32:	Factorizations of 25:	Factorizations of 48:
Factors of 32:	Factors of 25:	Factors of 48:

2. Which of the following is *not* a factor of 30?

(1) 10 (3) 3

(2) 2 (4) 4 _____

3. List all the prime numbers that are less than 20. Remember that 1 is **not** a prime number.

This page (front/back) is Homework - on your own

USING YOUR MATH

4. The area of a rectangle is 18 square centimeters. If the length and width are both whole numbers, list all possible values for the length and width (assuming the length is the longer side). Draw each rectangle.

5. A rectangle has an area of 11 square inches. If its length and width are both whole numbers, what is the **perimeter** of this rectangle in units of inches? **Remember:** perimeter is the total length that surrounds a figure. Show how you found your answer.

REVIEWING YOUR MATH

6. What is the least common multiple of 6 and 10?

7. Evaluate each of the following:

(a) $\begin{array}{r} 52 \\ \times\ 7 \\ \hline \end{array}$ (b) $8\overline{)184}$

8. Donna has 32 cards in her deck which is four times as many as Laura has. If Laura adds six cards to her deck, how many will she have? Justify your answer.