NAME_____

Module 4 **Fractions, Decimals, Percents, and Factors**
Lesson 4 **Prime Factorization, GCF, and LCM**

Challenge Problems 4.4

Set 1

1. Johnny found the LCM of 8, 16, and 20 by listing the multiples of 16 and 20 only. Explain why Johnny does not have to list the multiples of eight.

Set 2

1. When is the LCM of two numbers the same as one of the numbers? Use prime factorization to explain the answer.

2. When is the LCM of two numbers the product of the two numbers? Use prime factorization to explain the answer.

Set 3

1. Explain how to find the LCM of three numbers using prime factorization.

2. Explain how to find the GCF of three numbers using prime factorization.

3. Explain when the GCF would be needed to solve a word problem.

Possible Answers

Set 1

1. **Johnny does not have to list the multiples of eight because every multiple of 16 is also a multiple of eight.**

Set 2

1. **The LCM of two numbers is the same as one of the numbers when the greater number is a multiple of the lesser number.**

   If the prime factorization of the lesser number is repeated exactly in the greater number's prime factorization, then the greater number will be the LCM of the two numbers.

2. **The LCM of two numbers is the product of the two numbers when the two prime factorizations have no prime factors in common.**

Set 3

1. **To find the LCM of three numbers using prime factorization, write the prime factorization of each number. The LCM is the product of the prime factors. Each prime factor is used the greatest number of times it occurs in any one factorization.**

2. **To find the GCF of three numbers using prime factorization, write the prime factorization of each number. The GCF is the product of all the prime numbers common to all three prime factorizations.**

3. **The GCF needs to be found when a problem requires equal groups of different things or when a problem requires identical combinations of different things.**