Factors and Multiples

Vocabulary Start-Up

A *common factor* is a number that is a factor of two or more numbers. The greatest of the common factors of two or more numbers is called the **greatest common factor** (GCF).

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

Fill in the charts below. Sample answers are given.

GCF

- stands for:
  Greatest Common Factor

Define:
- Greatest **The largest of a set of values.**

- Common **The same feature among several numbers.**

- Factor **A number that is multiplied by another number.**

LCM

- stands for:
  Least Common Multiple

Define:
- Least **The smallest of a set of values.**

- Common **The same feature among several numbers.**

- Multiple **The product of a number and any whole number.**

Real-World Link

Bryan is making balloon arrangements. He has 8 blue and 12 green balloons. What is th...

Essential Question

HOW do you use equivalent rates in the real world?

Vocabulary

greatest common factor
least common multiple

CCSS Common Core State Standards

Content Standards
6.NS.4

MP Mathematical Practices
1, 3, 4, 8

Guided Practice

Find the greatest common factor of each set of numbers. (Example 1 and 2)

1. 8, 32   **8**

2. 24, 60   **12**

3. 3, 12, 18   **3**

Show your work

Find the least common multiple of each set of numbers. (Examples 3 and 4)

4. 7, 9   **63**

5. 6, 15   **30**

6. 9, 12, 15   **180**

7. The Movie House gives away a $5 coupon for every 4 movies purchased. They give away a bag of popcorn for every 3 movies purchased. How many movies would you have to purchase in all before receiving both a $5 coupon and a bag of popcorn at the same purchase? (Example 5)

   12 movies

8. **ℯ** **Building on the Essential Question** How does finding the greatest common factor help you to solve real-world problems?   **Sample answer: The greatest common factor can help you to divide a number of different items equally among a group of people.**

Rate Yourself!

Are you ready to move on? Shade the section that applies.

YES   ?   NO
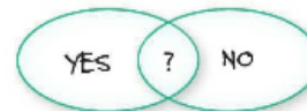
For more help, go online to the Personal Tutor.

Tutor

Independent Practice

Go online for Step-by-Step Solutions

eHelp

Find the greatest common factor of each set of numbers. (Example 2)

1. 8, 14 **2** _____

2. 21, 24, 27 **3** _____

Show your work

3. 21, 35, 49 **7** _____

4. 12, 18, 26 **2** _____

Find the least common multiple of each set of numbers. (Examples 3 and 4)

5. 5 and 6 **30** _____

6. 6 and 9 **18** _____

7 6, 12, and 15 **60** _____

8. 3, 9, and 15 **45** _____

Find the least common multiple of each set of numbers. (Examples 3 and 4)

5. 5 and 6 _30_

6. 6 and 9 _18_

7. 6, 12, and 15 _60_

8. 3, 9, and 15 _45_

9. A gardener has 27 pansies and 36 daisies. He plants an equal number of each type of flower in each row. What is the greatest possible number of pansies in each row? (Example 1)

9 pansies

10. Fourteen boys and 21 girls will be equally divided into groups. Find the greatest number of groups that can be created if no one is left out. (Example 1)

7 groups

11. Inez waters her plants every two days. She trims them every 15 days. She did both today. When will she do both again? (Example 5) **30 days**

12. 🅜 **Identify Repeated Reasoning** An airport offers two shuttles that run on different schedules. If both shuttles leave the airport at 4:00 P.M., at what time will they next leave the airport together?

4:18 P.M.

Shuttle Schedule	
Shuttle	**Departs**
A	every 6 minutes
B	every 9 minutes

🔥 H.O.T. Problems Higher Order Thinking

13. 🅜 **Model with Mathematics** Write and solve a real-world problem that can be solved using the greatest common factor of two numbers.

Sample answer: A gardener has 27 daisies and 36 marigolds. An equal

number of each flower is planted in each row. What is the greatest

number of marigolds in each row? 9 marigolds

14. 🅜 **Identify Repeated Reasoning** How can you use number patterns to find the least common multiple of 120 and 360?

Sample answer: You can divide both numbers by 10 and think about the

LCM of 12 and 36. Since 36 is the LCM of 12 and 36, 360 is the LCM of 120

and 360.

15. 🅜 **Persevere with Problems** If the GCF of two numbers is 1, they are called *relatively prime*. Find three sets of relatively prime numbers.

7 and 20, 5 and 8, 4 and 9

16.

13. **MP Model with Mathematics** Write and solve a real-world problem that can be solved using the greatest common factor of two numbers.

Sample answer: A gardener has 27 daisies and 36 marigolds. An equal number of each flower is planted in each row. What is the greatest number of marigolds in each row? 9 marigolds

14. **MP Identify Repeated Reasoning** How can you use number patterns to find the least common multiple of 120 and 360?

Sample answer: You can divide both numbers by 10 and think about the LCM of 12 and 36. Since 36 is the LCM of 12 and 36, 360 is the LCM of 120 and 360.

15. **MP Persevere with Problems** If the GCF of two numbers is 1, they are called *relatively prime*. Find three sets of relatively prime numbers.

7 and 20, 5 and 8, 4 and 9

16. **MP Use a Counterexample** Determine whether each statement is *true* or *false*. If *true*, explain why. If *false*, give a counterexample.

a. The GCF of any two even numbers is always even.

true; Sample answer: All even numbers have a factor of 2. So, the GCF will always have 2 as a factor. So the GCF of two even number is always even.

b. The GCF of any two odd numbers is always odd.

true; Sample answer: An odd number does not have a factor of 2. So, the GCF of two odd numbers will not have a factor of 2 and is always odd.

c. The GCF of an odd number and an even number is always even.

false; Sample answer: The GCF of 45 and 60 is 15.