

## Lesson 18: Least Common Multiple and Greatest Common Factor

### Classwork

#### Opening

The **Greatest Common Factor** of two whole numbers  $a$  and  $b$ , written  $GCF(a, b)$ , is the greatest whole number, which is a factor of both  $a$  and  $b$ .

The **Least Common Multiple** of two nonzero numbers  $a$  and  $b$ , written  $LCM(a, b)$ , is the least whole number (larger than zero), which is a multiple of both  $a$  and  $b$ .

#### Example 1: Greatest Common Factor

Find the greatest common factor of 12 and 18.

- Listing these factor pairs in order can help you not miss any. Start with one times the number.
- Circle all factors that appear on both lists.
- Place a triangle around the greatest of these common factors.

GCF (12, 18)

12


18


**Example 2: Least Common Multiple**

Find the least common multiple of 12 and 18.

LCM (12, 18)

Write the first 10 multiples of 12.

Write the first 10 multiples of 18.

Circle the multiples that appear on both lists.

Put a rectangle around the least of these common multiples.

**Exercises****Station 1: Factors and GCF**

Choose one of these problems that has not yet been solved. Solve it together on your student page. Then, use your marker to copy your work neatly on the chart paper. Use your marker to cross out your choice so that the next group solves a different problem.

GCF (30, 50)

GCF (30, 45)

GCF (45, 60)

GCF (42, 70)

GCF (96, 144)



**Station 2: Multiples and LCM**

Choose one of these problems that has not yet been solved. Solve it together on your student page. Then, use your marker to copy your work neatly on the chart paper. Use your marker to cross out your choice so that the next group solves a different problem.

LCM (9, 12)

LCM (8, 18)

LCM (4, 30)

LCM (12, 30)

LCM (20, 50)

Next, choose one of these problems that has not yet been solved. Solve it together on your student page. Then, use your marker to copy your work neatly on this chart paper. Use your marker to cross out your choice so that the next group solves a different problem.

- Hot dogs come packed 10 in a package. Hot dog buns come packed 8 in a package. If we want one hot dog for each bun for a picnic, with none left over, what is the least amount of each we need to buy? How many packages of each item would we have to buy?
- Starting at 6:00a.m., a bus makes a stop at my street corner every 15 minutes. Also starting at 6:00a.m., a taxi cab comes by every 12 minutes. What is the next time there will be a bus and a taxi at the corner at the same time?
- Two gears in a machine are aligned by a mark drawn from the center of one gear to the center of the other. If the first gear has 24 teeth, and the second gear has 40 teeth, how many revolutions of the first gear are needed until the marks line up again?

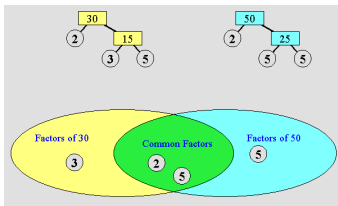
d. Is the LCM of a pair of numbers ever equal to one of the numbers? Explain with an example.

e. Is the LCM of a pair of numbers ever less than both numbers? Explain with an example.

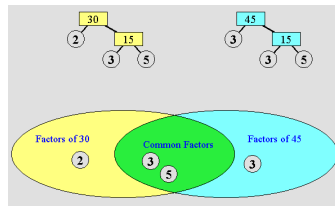
**Station 3: Using Prime Factors to Determine GCF**

Choose one of these problems that has not yet been solved. Solve it together on your student page. Then, use your marker to copy your work neatly on the chart paper. Use your marker to cross out your choice so that the next group solves a different problem.

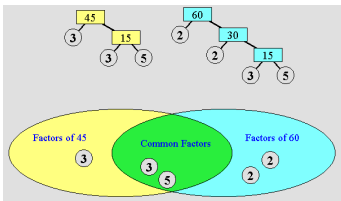
GCF (30, 50)



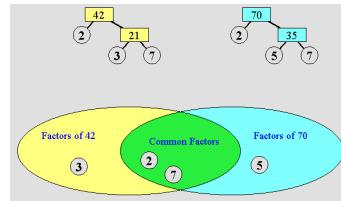
GCF (30, 45)



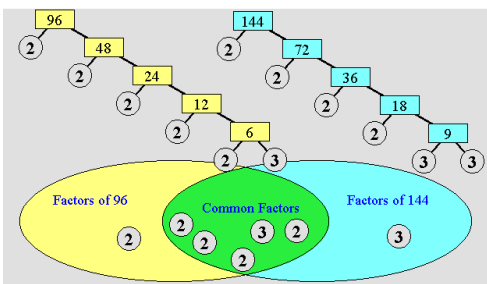
GCF (45, 60)



GCF (42, 70)



GCF (96, 144)



Next, choose one of these problems that has not yet been solved:

- Would you rather find all the factors of a number or find all the prime factors of a number? Why?
- Find the GCF of your original pair of numbers.
- Is the product of your LCM and GCF less than, greater than, or equal to the product of your numbers?
- Glenn's favorite number is very special because it reminds him of the day his daughter, Sarah, was born. The factors of this number do not repeat, and all the prime numbers are less than 12. What is Glenn's number? When was Sarah born?

#### Station 4: Applying Factors to the Distributive Property

Choose one of these problems that has not yet been solved. Solve it together on your student page. Then, use your marker to copy your work neatly on the chart paper. Use your marker to cross out your choice so that the next group solves a different problem.

Find the GCF from the two numbers, and rewrite the sum using the distributive property.

- $12 + 18 =$
- $42 + 14 =$
- $36 + 27 =$
- $16 + 72 =$
- $44 + 33 =$

Next, add another new example to one of these two statements applying factors to the distributive property.

Choose any numbers for  $n$ ,  $a$ , and  $b$ .

$$n(a) + n(b) = n(a + b)$$

$$n(a) - n(b) = n(a - b)$$

### Problem Set

Complete the remaining stations from class.