Unit 7, Lesson 17

Common Multiples

Let's use multiples to solve problems.

17.1 Notice and Wonder: Multiples

Circle all the multiples of 4 in this list.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

Circle all the multiples of 6 in this list.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

What do you notice? What do you wonder?

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17.2 The Florist's Order

A florist can order roses in bunches of 12 and lilies in bunches of 8. Last month she ordered the same number of roses and lilies.

1. If she ordered no more than 100 of each kind of flower, how many different orders could she have placed? List all the possible orders she could have placed and how many of each kind of flower she would have received.

2. In which order would she receive the smallest number of flowers? How many flowers would she receive?

17.3 Least Common Multiple

The **least common multiple** of 6 and 8 is 24.

1. What do you think the term "least common multiple" means?

2. Find all of the **multiples** of 10 and 8 that are less than 100. Find the least common multiple of 10 and 8.

3. Find all of the multiples of 7 and 9 that are less than 100. Find the least common multiple of 7 and 9.

Are you ready for more?

1. What is the least common multiple of 10 and 20?

2. What is the least common multiple of 4 and 24?

3. In the previous two questions, one number is a multiple of the other. What do you notice about their least common multiple? Do you think this will always happen when one number is a multiple of the other? Explain your reasoning.

17.4 Prizes on Grand Opening Day

Lin's uncle is opening a bakery. On the bakery's grand opening day, he plans to give away prizes to the first 50 customers that enter the shop. Every 5th customer will get a free bagel. Every 9th customer will get a free blueberry muffin. Every 12th customer will get a free slice of carrot cake.

1. Diego is waiting in line and is the 23rd customer. He thinks that he should get farther back in line in order to get a prize. Do you agree?? If so, how far back should he go to get at least one prize? Explain your reasoning.

2. Jada is the 36th customer.

   a. Will she get a prize? If so, what prize will she get?

   b. Is it possible for her to get more than one prize? How do you know? Explain your reasoning.

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Lesson 17 Summary

A multiple of a whole number is a product of that number with another whole number. For example, 20 is a multiple of 4 because $20 = 5 \cdot 4$.

A **common multiple** for two whole numbers is a number that is a multiple of both numbers. For example, 20 is a multiple of 2 and a multiple of 5, so 20 is a common multiple of 2 and 5.

The **least common multiple** (sometimes written as LCM) of two whole numbers is the smallest multiple they have in common. For example, 30 is the least common multiple of 6 and 10.

One way to find the least common multiple of two numbers is to list multiples of each number in order until we find the smallest multiple they have in common. Let's find the least common multiple for 4 and 10. First, we list some multiples of each number.

- Multiples of 4: 4, 8, 12, 16, **20**, 24, 28, 32, 36, **40**, 44, . . .
- Multiples of 10: 10, **20**, 30, **40**, 50, . . .

20 and 40 are both common multiples of 4 and 10 (as are 60, 80, . . .), but 20 is the smallest number that is on *both* lists, so 20 is the least common multiple.