

6th Grade

MS319

Mathematics Department

[6TH GRADE MATHEMATICS]

New York Cares, Saturday Tutoring Program

Name: _____ Class: _____

Lesson 3: Factors and Multiples**OBJECTIVE: SWBAT**

1. Determine the greatest common factor and least common multiple of two or more numbers.
2. Solve real world problems involving factors and multiples. **(6.NS.4)**

INTRODUCTION + Vocabulary:

Organizers of banquets and other special events plan many things, including menus, seating arrangements, table decorations, and party favors. Factors and multiples can be helpful in this work as follow:

1. To split things into smaller sections.
2. To equally distribute 2 or more sets of items into their largest grouping
3. To figure out how many people we can be invited to an invited.
4. To arrange something into rows or groups.

Furthermore, most modern cryptography computer programs are based on the fact that it's easy to multiply large numbers together, but very difficult to factor the result. This makes it possible to easily encode messages, but almost impossible to decode them without the key. That principle is what allows us to keep so much information (bank records, etc.) online without worrying that it will be stolen.

- **Common factors** of two or more numbers: Factors that are the same
- The **greatest common factor** (GCF) of two numbers is the greatest factor shared by those numbers
- The **least common multiple** (LCM) of two or more numbers is the least number, other than zero, that is a multiple of all the numbers.

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MINI-LESSON (I DO):**Multiples: everyday examples**

1. A shop sells 4 chairs in a set.

Which of the following numbers of chairs make complete sets (circle your answers)?

10, 12, 15, 20, 22, 28, 35

Tip: think of sets of chairs around a table.

**Solution:**

Since chairs come in sets of 4, we have to determine all multiples of 4 that are in the list.

The multiples of 4 are: 4, 8, 12, 16, 20, 24, 28, 32, 36...

We stopped at 36 because 36 is bigger than largest number in the problem, 35.

Next, we to determine which numbers in in the problem are found in the list of multiples of 4: 12, 20, and 38.

Therefore, 12, 20, and 28 make complete sets of 4 because they are multiples of 4.

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Guided Practice: (We do):

Machines S and T were both cleaned this week.

- Machine S is cleaned every 12 weeks.
- Machine T is cleaned every 8 weeks.

What is the **fewest** number of weeks that will pass before both machines are cleaned again in the same week?

Solution:

To answer this question, we need to know the least common multiple of 12 and 8. To find the least common multiple of two numbers, we find the multiples of each numbers, and then compare the multiples to identify the smaller in common multiple.

Multiples of 12: 12, **24**, 36, 48, 60, 72, 84, 96, 108...

Multiples of 8: 8, 16, **24**, 36...

The least common multiple is 24. This means that Machines S and Machines T will be both cleaned, in the same week, in 24 weeks.

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Independent Practice (You do):

Problem 1:

Use the numbers 14 and 28 to complete the following steps.

Part A: Find the factors of 14.

Part B: Find the factors of 28.

Part C: List any numbers that are factors of both numbers.

Part D: Explain how these two numbers can have some of the same factors.

Part E: What is the least common factor of 14 and 28?

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Problem 2:

What is the least common multiple of 12 and 10?

- A** 2
- B** 4
- C** 60
- D** 120

Problem 3:

What is the greatest common factor of 64 and 84?

- A** 2
- B** 4
- C** 6
- D** 8

Problem 4:

What is the least common multiple of 4, 10, and 12?

- A** 2
- B** 60
- C** 120
- D** 480

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Problem 5:

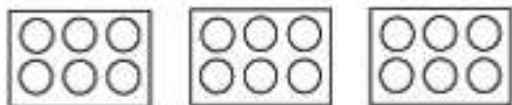


2. Eggs are packed in boxes of 6.

Which of the following amount of eggs fill a whole number of boxes (circle your answers)?

10, 12, 15, 21, 24, 25, 30

Tip: draw some boxes of eggs.



Show your work.

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Problem 6:

Adrian is planning a class picnic. He wants to buy an equal number of hot dogs and hotdog buns. Hot dogs come in packages of 12. Hot dog buns come in packages of eight.

Part A:

What is the fewest number of packages he could buy to have an equal number of each?

Part B:

Adrian is expecting 60 people at the picnic. How many packages should he buy to have an equal number of each, and have enough for all the people at the picnic?

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Problem 7:

Timothy went to a baseball game. After the game, he wanted to ride the bus home. The red line and the blue line buses both stop at the stadium.

- A red line and a blue line bus both left the stadium at 4:00 p.m.
- Red line buses were scheduled to leave the stadium every 6 minutes.
- Blue line buses were scheduled to leave the stadium every 8 minutes.

If the buses run on schedule, when is the next time a red line and a blue line bus will leave together?

Show your work.

Answer _____ p.m.

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Problem 8:

Mr. Yee works as an air traffic controller. He noticed that, beginning at 6 p.m., West Air flights arrive every 15 minutes and Air Saskatchewan flights arrive every 12 minutes. At which times will Mr. Yee be most occupied?

Show your work.

Problem 9:

Mrs. Evans has 120 crayons and 30 pieces of paper to give to her students. What is the largest number of students she can have in her class so that each student gets equal number of crayons and equal number of paper.

Show your work.

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Problem 10:

Two bikers are riding a circular path. The first rider completes a round in 12 minutes. The second rider completes a round in 18 minutes. If they both started at the same place and time and go in the same direction, after how many minutes will they meet again at the starting point?

Show your work.

Final Summary

In a U-Shape:

1. Re-state the objective to assess if students learn it
2. Elicit from students what they have learned and what they want to learn more about.
3. Tie what they learn to the lesson, and upcoming lessons (Next Saturday ratios and unit rates)