LOWEST COMMON MULTIPLE

3.20.2019

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

3

Overview

This lesson plan covers teaching content for;

1. Calculating and identifying multiples of a number.
2. Factorization of numbers
3. Expressing numbers as a product of prime factors.
4. Calculating the LCM of two or more numbers less than or equal to 9.

Objectives

Students should be able to;

1. Successfully factorize numbers and express numbers as a product of factors.
2. List the first ten multiples of any whole number less than or equal to 9.
3. Determine the LCM of two whole numbers less than or equal to 9.
4. Solve for the LCM of numbers using any of the methods of factorization to be explained (Prime factorization method, division method)

Activity Starter/Instruction

Guide students to fill in and understand some concepts and definitions. Let them know that this is the most important part of the lesson.

1. **Multiple** – a multiple of a number is the product of that number and another whole number greater than 0. For example, the multiples of 3 simply go up by 3 each time. Also explain that the multiples of 3 are 3x1, 3x2, 3x3, etc. In addition, talk about the fact that a multiple is a number that another number can go into with having a remainder!
2. **Common multiples** – multiples that two of more numbers share.
3. **Least common multiple** – the least multiple that two or more numbers share.
4. **Prime Number** - a number that has exactly two different factors, 1 and itself.
5. **Factor -** one of two or more numbers that can be multiplied to form a product. “2, 3, and 5 are all factors of 30”.
6. Test the students by asking them to list examples of prime numbers, factors and multiples of numbers.

Teacher Guide

Day 1/ Lesson 1: 15 Mins

1. Remind the students that when we find the least common multiple, we find the smallest multiple that two numbers have in common. In order to do this, we must first list several multiples of each number.
2. Write a number e.g. 3 on the board. Have students help you list the multiples. Remind them that in order to come up with the multiples, they can either count by 3s or use multiplication.
3. After listing several multiples of 3, write another number e.g. 6 on the board. Have students help you list the multiples of this number (6).
4. Show students how to underline the multiples that are common, and then circle the one that is the smallest.
5. In this example, students should see that 6 is the least common multiple.

Materials Required

- Blank Sheet
- Index cards
- Pencils
- White Board

Additional Resources

- https://www.math-only-math.com/to-find-least-common-multiple-by-using-division-method.html
- https://aminghori.blogspot.com/2017/02/normal-0-false-false-false-en-us-x-none.html
- https://www.education.com/lesson-plan/clap-counting-with-multiples/
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 20 Mins

1. The teacher explains that L.C.M. Can also be calculated using the prime factorization method:
2. Resolve each number into its prime factors and express the factors in exponent form (product of its prime factors).
   E.g.
   For two numbers, 6 and 8,
   $6 = 2 * 3$
   $8 = 2 * 2 * 2 = 2^3$
3. Separate all highest power factors from all factorizations. Find the product of the highest powers of all the factors that occur in any of the given numbers.
   In our example, the product of the factors with the highest power = $2^3 * 3$
4. The product obtained above is the required least common multiple
   Therefore we have
   $2^3 * 3 = 24$.

Teacher Guide

Day 3/ Lesson 3: 25 Mins

1. The teacher also teaches the students how to find L.C.M. using division method
2. Write the numbers in a horizontal line, separating them by using commas.
3. Divide them by a suitable prime number, which exactly divides at least two (2) of the given numbers.
4. We put the quotient (i.e. division result) directly under the numbers in the next row. If the number is not divided exactly, we bring it down to the next row.
5. Continue the two steps above until all co-prime numbers are left in the last row.
6. We multiply all the prime numbers by which we have divided and the co-prime numbers left in the last row.
7. This product is the least common multiple.
8. For example, to find the L.C.M. of 6, 8 and 10

2	6, 8, 10
2	3, 4, 5
2	3, 2, 5
3	3, 1, 5
5	1, 1, 5
	1, 1, 1

Therefore, the L.C.M. of 6,8,10 is
$2*2*2*3*5 = 120$.

Teacher Guide

Day 4/ Lesson 4: 25 Mins

1. Have students stand up and create a circle around the classroom.
2. Explain that they will be doing something called "clap counting."
3. The teacher will give a number. Students will take turns counting up by one.
4. If a student's number is a multiple of the given number, they will clap instead of saying the number. The next person will continue counting up. For example, if the number three were given, the sequence would be as follows: one, two, clap, four, five, clap, seven, eight, clap, etc. The sequence will continue until all students have said a number or clapped.
5. Complete this exercise several times with various numbers.
6. Have students sit back down and work with a partner and distribute scratch paper to them. Give them two sets of numbers of which to find the least common multiple.
7. Instruct students to write down the multiples of the two numbers assigned to them. Students should do "clap counting" with each number as they list the multiples.

Assessment Activity

Assessment Activity

1. The teacher gives students a problem to work through on their own.
2. The teacher suggests that they try both methods, before they decided which method they prefer.
3. As students work, circulate to answer any questions and to assess students' understanding.
4. A common mistake when using method 2 is students only multiply the numbers in the non-overlapping sections of the diagram instead of all of the numbers.
5. Find the LCM of 12 and 15..

Assessment Activity

1. The teacher sets a word problem question for the students and explain the concept to them. He then tells them to solve and get the answer.

Question:

During the summer months, one ice cream truck visits Jeannette's neighborhood every 4 days and another ice cream truck visits her neighborhood every 5 days. If both trucks visited today, when is the next time both trucks will visit on the same day?

Truck	Days of Visits
1	4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, ...
2	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, ..

Summary

Review and Closing

1. The teacher gives each student an index card/blank sheet and the problem "Find the prime factorization of 32" to solve.
2. They will show their work on the index card/sheet and hand it in before leaving class.
3. The teacher explains to students that this is not a quiz or test, but just a way for me to check on their understanding.
4. Use these cards/sheet to assess students' understanding of prime factorization.

Review and Closing

1. Remind students that the skill of finding the least common multiple will come in handy as they begin solving more complex fraction problems!