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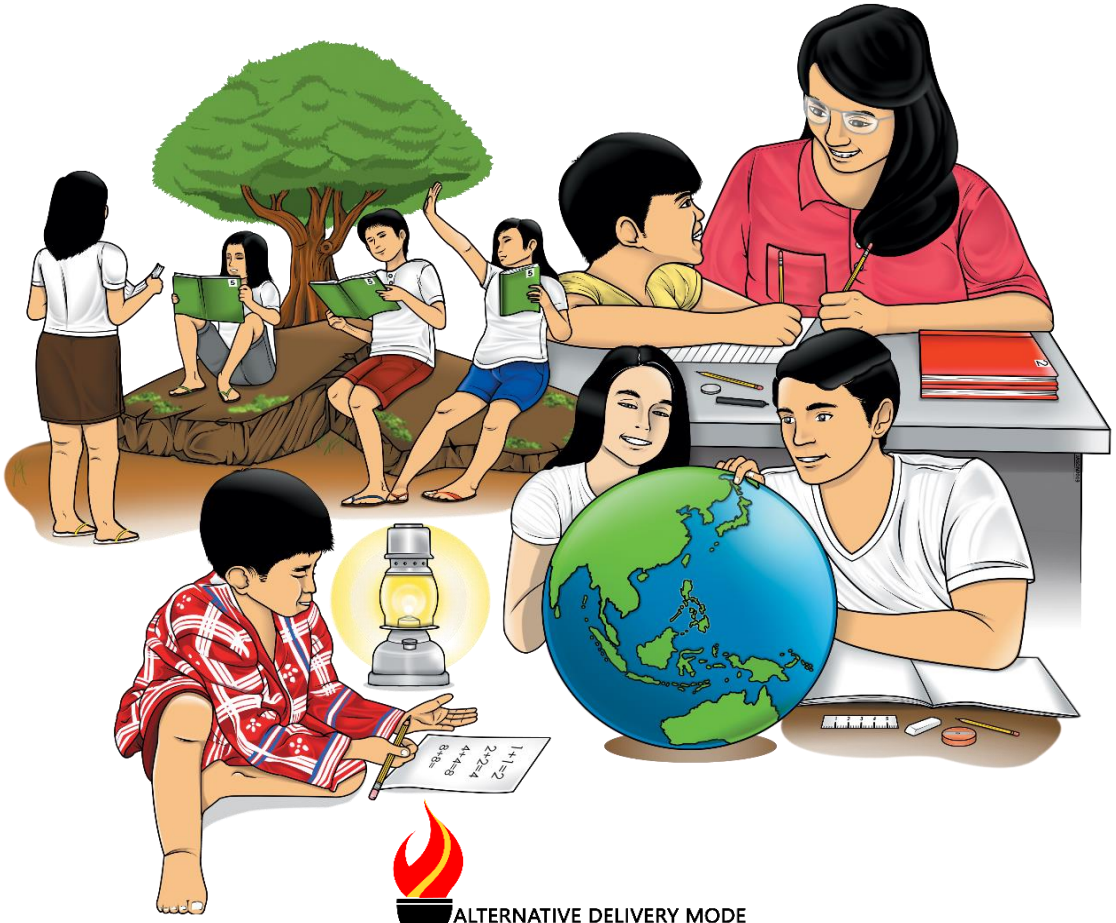
Mathematics
Quarter 2 – Module 3:
Least Common Multiple



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Mathematics
Quarter 2 – Module 3:
Least Common Multiple

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

In our day to day living, we sometimes encounter situations where we need to think of things like: Do we have an event that will be repeating over and over? Do we have to purchase or get multiple items in order to have enough? Are we trying to figure out when something will happen again at the same time? This is when we use the concept of Least Common Multiple (LCM).

Least Common Multiple can be of great help in our daily living. In this module, you will perform exercises that will help you understand Least Common Multiple (LCM).

After going through this module, you are expected to:

1. find the common multiples and the least common multiple (LCM) of two numbers using the following methods: listing, prime factorization, and continuous division; and
2. solve real-life problems involving LCM of 2 given numbers.

Lesson 1

Finding the Common Multiples and the Least Common Multiple of Two Numbers

What I Know

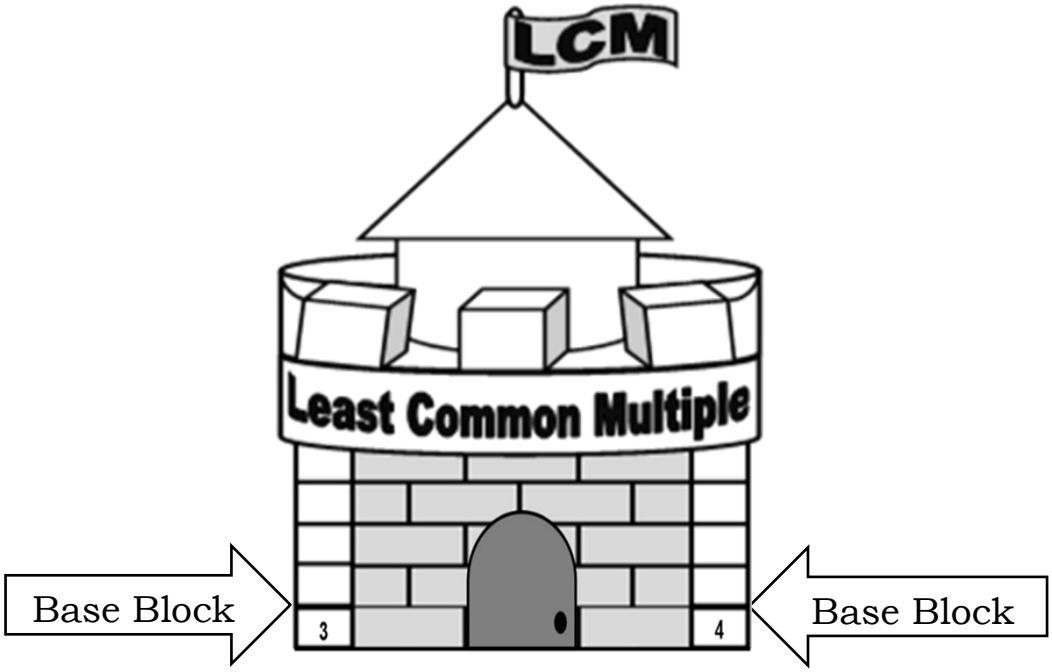
Let us try to see what you know about Least Common Multiple (LCM).

"TOWER CLIMB"

Try to find the Least Common Multiple (LCM) of 3 and 4 using Tower Climb.

Follow the steps:

1. Copy the tower shown in a piece of paper.
2. Write 3 and 4 in the base blocks.
3. Climb the tower by skip counting. Use the given numbers to give their multiples, write the next number in the next block (upward direction).



4. Fill in the needed data based from your observation.

I observed that the first 4 multiples of 3 are:

1. ____
2. ____
3. ____
4. ____

I observed that the first 4 multiples of 4 are:

5. ____
6. ____
7. ____
8. ____

I observed that the first common multiple of 3 and 4 is:

9. ____

Their Least Common Multiple (LCM) is:

10.____

If you are done answering the activity, please go to the ***Answer Key*** on page 20 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

What's In

Let us review first some of the concepts that can help you understand Least Common Multiple (LCM).

A. Find the Greatest Common Factor (GCF) of the given pair of numbers using any of the following methods: listing, prime factorization, and continuous division.

1. 18 and 54
2. 21 and 56
3. 81 and 99
4. 72 and 66
5. 64 and 72

If you are done answering the activity, please go to the ***Answer Key*** on page 20 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

Notes to the Teacher

The activities may be supplemented and enhanced with some contextualized problems that will get the interest of the learners to perform well in finding the common multiples and LCM of two numbers.

What's New

Let us start learning the new concept with the help of this story problem.

Read the story problem.

The Grade 4 pupils of Ms. Rachel participated in the recycling activity of the school. They collected plastic bottles and arranged them in boxes of 4 and 6. What is the least possible number of bottles that the class gathered?

What is asked in the problem?

- The least possible number of bottles that the class gathered.

What are the given facts that can help you solve the problem?

- boxes of 4, boxes of 6

What can you say about the class of Ms. Rachel?

- They are helping restore our planet by means of recycling.

Try to answer the problem. Have patience and have fun!

We will find out on the next part of this module whether you answered the problem properly and correctly.

What is It

This problem is about finding the least common multiple because it requires us to find the least possible number of bottles that the class gathered.

Least Common Multiple (LCM) is the smallest multiple common to the given numbers.

You can find the answer to the given problem using different methods.

Study the solutions below.

Method 1. Listing Method

List the multiples of 4 and 6.

multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, …
multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, …

Find the common multiples of 4 and 6.
Common Multiples: 12 , 24, 36, …

Get the smallest or Least Common Multiple (LCM) of 4 and 6.
LCM: 12

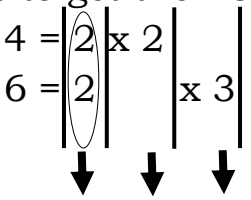
Method 2. Prime Factorization

Write each number as a product of its prime factors using factor tree method.

List down the prime factors of 4 and 6.

4 = 2 x 2
6 = 2 x 3

Multiply the common prime factor of 4 and 6 to the other factors to get the LCM.



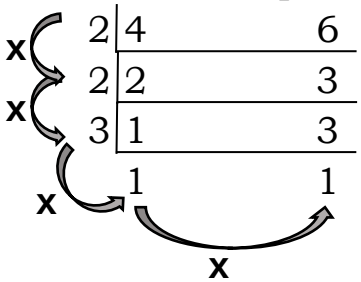
2 x 2 x 3 = 12

LCM: 12

Method 3. Continuous Division

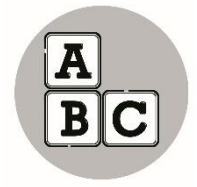
Continuous Division is done following the steps below.

1. Write the numbers horizontally and find a prime number that will divide the numbers, if possible.
2. Divide the numbers by that prime number and write each quotient below the respective dividends. Copy any numbers not yet divided below the dividend.
3. Continue the process until all the quotients are 1.



4. Multiply all the prime divisors to get the LCM.
   2 x 2 x 3 x 1 x 1 = 12
   LCM :12

Therefore, the least possible number of bottles that the class gathered is 12.



What's More

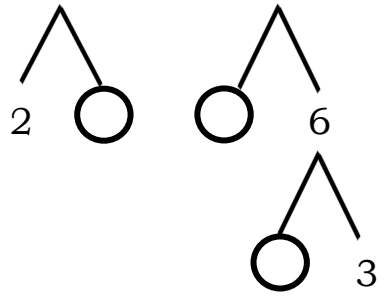
Let us see if you already know how to find the Least Common Multiple (LCM) of a given pair of numbers.

Activity 1. Find the first 3 common multiples and the Least Common Multiple (LCM) of each pair of numbers. Some of the multiples are already given.

1. 2 = 2, 4, 6, 8, 10, …
   4 = 4, 8, 12, 16, 20, …
   Common Multiples:_____
   LCM:_____
2. 5 = 5, 10, 15, 20, 25, …
   6 = 6, 12, 18, 24, 30, …
   Common Multiples:_____
   LCM:_____
3. 4 = 4, 8, 12, 16, 20, …
   8 = 8, 16, 24, 32, 40, …
   Common Multiples:_____
   LCM:_____
4. 3 = 3, 6, 9, 12, 15, …
   9 = 9, 18, 27, 36, 45,
   Common Multiples:_____
   LCM:_____
5. 10 = 10, 20, 30, 40, 50, …
   15 = 15, 30, 45, 60, 75, …
   Common Multiples:_____
   LCM:_____

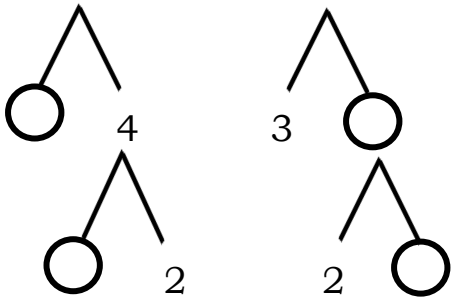
Activity 2. Find the Least Common Multiple (LCM) of each pair of numbers using Prime Factorization.

1. 4 and 12



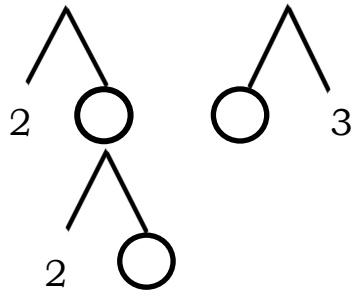
LCM:___

2. 8 and 12



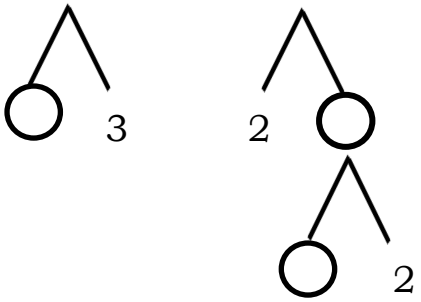
LCM:___

3. 12 and 6



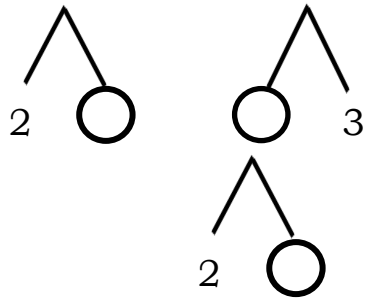
LCM:___

4. 9 and 8



LCM:___

5. 10 and 12



LCM:___

Activity 3. Find the Least Common Multiple (LCM) of each pair of numbers using Continuous Division.

1.

3	6 and 9
2	2 3
3	1 3
	1 1

LCM : ____

4.

3	15 and 30
5	5 10
2	1 2
	1 1

LCM : ____

2.

7	35 and 21
5	5 3
3	1 3
	1 1

LCM : ____

5.

3	15 and 45
5	5 15
3	1 3
	1 1

LCM : ____

3.

2	12 and 24
2	6 12
3	3 6
2	1 2
	1 1

LCM : ____

If you are done answering the activity, please go to the ***Answer Key*** on page 20 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

What I Have Learned

You are doing great!

Just always remember:

1. Least Common Multiple (LCM) is the smallest multiple common to the given numbers.
2. We can find the Least Common Multiple (LCM) of two numbers using three different ways: listing method, prime factorization and continuous division.

What I Can Do

Let us see if you are now ready to solve this problem.

Read and understand the problem, then answer the questions that follow.

Manuel and Amy love dogs. Manuel buys food for his dogs every 4 days while Amy buys food for her dogs every 6 days. If they buy food for their pets today, on what day will they buy again food for their pets at the same time?

What can you say about Manuel and Amy? What kind of persons are they?

What is asked in the problem?

What are the given facts that can help you solve the problem?

If you will solve for the LCM of 4 and 6, what will be the answer?

If you are done answering the activity, please go to the ***Answer Key*** on page 20 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

Assessment

You are now ready for the next activity.

A. Find the Least Common Multiple (LCM) of the given pair of numbers using any of the following methods: listing, prime factorization, and continuous division.

1. 11 and 22
2. 10 and 20
3. 12 and 3
4. 8 and 24
5. 4 and 16

B. True or False. Write True if the statement is correct and False if the statement is incorrect.

6. 30 is a common multiple of 5 and 6.
7. The product of 2 whole numbers is not a common multiple of the 2 numbers.
8. The LCM of 8 and 11 is 88.
9. 15 is the LCM of 10 and 15.
10. The LCM of 14 and 42 is 42.

If you are done answering the activity, please go to the ***Answer Key*** on page 21 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

Additional Activities

Let us try some more.

A. Find the Least Common Multiple (LCM) of the given pair of numbers using any of the following methods: listing, prime factorization, and continuous division.

1. 8 and 12 2. 20 and 30

B. Write the letter of the correct answer.

1. Which of the following is a common multiple of 3 and 4?

a. 5 b. 7 c. 8 d. 12

2. The following are multiples of 2 and 6, except one. Which of the following is not a multiple of 2 and 6?

a. 6 b. 8 c. 12 d. 18

3. If 9 is the LCM of 3 and 9, then __ is the LCM of 3 and 10?

a. 30 b. 40 c. 50 d. 60

If you are done answering the activity, please go to the ***Answer Key*** on page 21 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

Lesson 2

Solving Word Problems Involving Least Common Multiple

What I Know

Let us try to see what you know about Least Common Multiple (LCM).

Read each problem and answer the questions that follow.

1. What is the smallest number of mangoes that can be placed in boxes with 12 and 15 pieces?
   a. What is asked in the problem?
   b. What facts are given?
   c. How will you solve the problem?
   d. Show your solution.
   e. What is the answer to the problem?

2. Annabelle noticed in her math subject that the page number assigned for their homework is divisible by both 10 and 15. What could be the smallest possible page number assigned for their homework?
   a. What is asked in the problem?
   b. What facts are given?
   c. How will you solve the problem?
   d. Show your solution.
   e. What is the answer to the problem?

If you are done answering the activity, please go to the ***Answer Key*** on page 21 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

What's In

Let us review first some of the concepts that can help you understand Least Common Multiple (LCM).

Read each problem and answer the questions that follow.

1. Manuel is to pack biscuits in small paper bags of 15 and 25 pieces. What is the least number of biscuits that can be packed using the paper bags?

   a. What is asked in the problem?
   b. What facts are given?
   c. How will you solve the problem?
   d. Show your solution.
   e. What is the answer to the problem?

2. Mugs are sold 4 in a pack and glasses are sold 6 in a pack. If you want to have the same number of each item for your family, what is the least number of packs of each item will you need to buy?

   a. What is asked in the problem?
   b. What facts are given?
   c. How will you solve the problem?
   d. Show your solution.
   e. What is the answer to the problem?

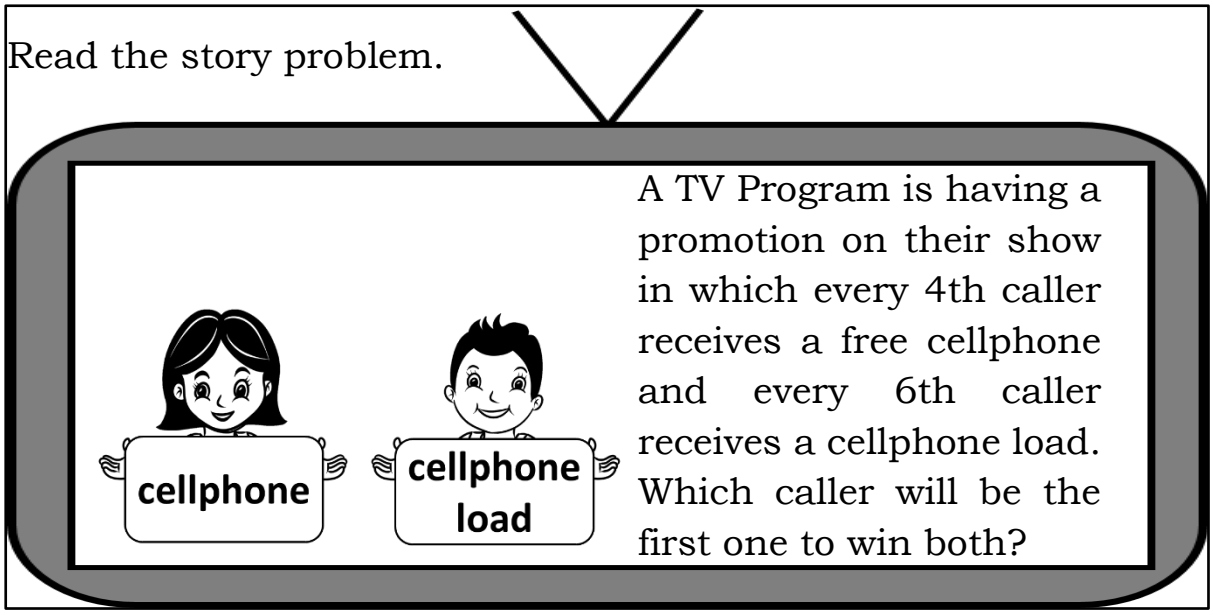
If you are done answering the activity, please go to the ***Answer Key*** on page 21 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

What's New

Let us start learning the new concept with the help of this story problem.

Read the story problem.



A TV Program is having a promotion on their show in which every 4th caller receives a free cellphone and every 6th caller receives a cellphone load. Which caller will be the first one to win both?

How will you solve the problem?

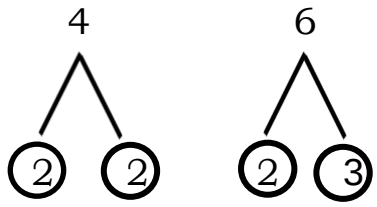
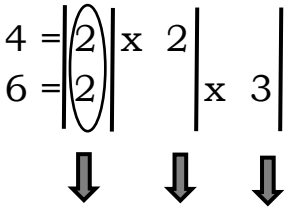
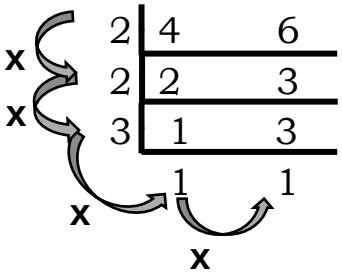
Try to answer the problem. Have patience and have fun!

We will find out on the next part of this module whether you answered the problem properly and correctly.

What is It

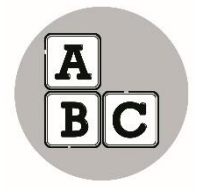
This problem is about finding the least common multiple because it requires us to find the first possible caller to win both prizes.

You can use the 4-step plan in solving for the answer. Study the solution on the next page.

Step 1. Understand	
What is asked in the problem?	The first caller to win both prizes
What facts are given?	4th caller, 6th caller
Step 2. Plan	
How will you solve the problem?	By finding the Least Common Multiple (LCM)
Step 3. Solve	
How is the solution done?	**Listing Method:** 4: 4, 8, 12, 16, 20, 24, … 6: 6, 12, 18, 24, 30, 36, … LCM: 12 **Prime Factorization:**   2 x 2 x 3 = 12 LCM: 12 **Continuous Division:**  2 x 2 x 3 x 1 x 1 = 12 LCM : 12

Step 4. Check and Look Back	
What is the answer to the problem?	The 12th caller will be the first to receive both

Therefore, the 12th caller will be the first to win both the cellphone and the cellphone load.



What's More

Let us see if you already know how to solve word problems involving Least Common Multiple.

Read each problem and answer the questions that follow.

1. Aldrin and Aisa are going to pack old books with 14 Mathematics books and 10 Science books in a box. What will be the smallest number of Mathematics and Science books that they can pack if these are of the same number?

a. What is asked in the problem?
b. What facts are given?
c. How will you solve the problem?
d. Show your solution.
e. What is the answer to the problem?

2. A bell rings every 20 seconds while a horn blows every 15 seconds. If you heard the two sounds at 8:00 a.m., at what time will you hear the sounds together again?

a. What is asked in the problem?
b. What facts are given?
c. How will you solve the problem?
d. Show your solution.
e. What is the answer to the problem?

If you are done answering the activity, please go to the ***Answer Key*** on page 22 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

What I Have Learned

You are doing great!

Just always remember that we can use 4-step plan in solving word problems involving Least Common Multiple (LCM). These are as follow:

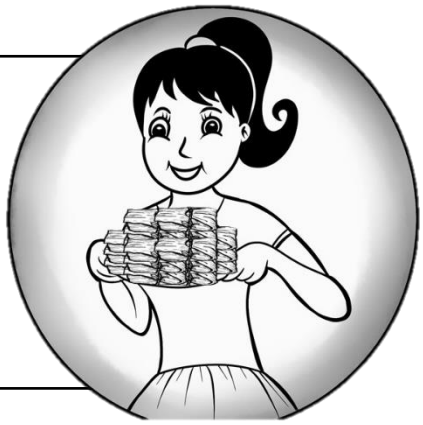
1. Understand
   a. What does the problem ask for?
   b. What facts are given?
2. Plan
   How will you solve the problem?
3. Solve
   How is the solution done?
4. Check and look back
   What is the answer to the problem?

What I Can Do

Let us see if you are now ready to solve this problem.

Read and understand the problem, then answer the questions that follow.

Aling Maria is going to sell *suman* in bundles. What is the least number of *suman* that she could sell in bundles of 6 and 7?



1. What is asked in the problem?
2. What facts are given?
3. How will you solve the problem?
4. Show your solution.
5. What is the answer to the problem?

Assessment

You are now ready for the next activity.

Read each problem and answer the questions that follow.

1. Amy noticed that the page number given for their assignment is divisible by both 11 and 8. What is the smallest possible page number that could have been given for their assignment?
   a. What is asked in the problem?
   b. What facts are given?
   c. How will you solve the problem?
   d. Show your solution.
   e. What is the answer to the problem?

2. Boxes that are 7 centimeters tall are being stacked next to boxes that are 5 centimeters tall. What is the shortest height at which the two stacks will be of the same height?
   a. What is asked in the problem?
   b. What facts are given?

c. How will you solve the problem?
d. Show your solution.
e. What is the answer to the problem?

If you are done answering the activity, please go to the ***Answer Key*** on page 22 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

Additional Activities

Let us try some more.

Challenge yourself by answering the problem.

Amanda and Rey are arranging books in the library. Amanda arranges 8 books at a time while Rey arranges 9 books at a time. If they end up arranging the same number of books, what is the smallest number of books each could have arranged?

If you are done answering the activity, please go to the ***Answer Key*** on page 22 and check if your answers are correct.

Thank you for your honesty in answering and checking your work. Hope you will do this until the end of this module.

Answer Key

LESSON 1: FINDING THE LEAST COMMON MULTIPLE OF TWO NUMBERS

What I Know

1. 3
2. 6
3. 9
4. 12
5. 4
6. 8
7. 12
8. 16
9. 12
10. 12

What's In

1. 18
2. 7
3. 9
4. 6
5. 8

What's More (pages 7-9)

Activity 1

1. Common Multiples: 4, 8, 12
   LCM: 4
2. Common Multiples: 30, 60, 90
   LCM: 30
3. Common Multiples: 8, 16, 24
   LCM: 8
4. Common Multiples: 9, 18, 27
   LCM: 9
5. Common Multiples: 30, 60, 90
   LCM: 30

Activity 3

1. 18
2. 105
3. 24
4. 30
5. 45

What I Can Do

1. They feed their pets. They are animal lovers.
2. The day that they will buy again food for their pets at the same time.
3. every 4 days, every 6 days
4. 12

Assessment

A

1. 22
2. 24
3. 20
4. 16
5. 12

B

6. True
7. False
8. True
9. False
10. True

Additional Activities

A

1. 24
2. 60

B

1. d
2. b
3. a

LESSON 2: SOLVING WORD PROBLEMS INVLIVING LEAST COMMON MULTIPLE

What I Know

1. a. the smallest number of mangoes that can be placed in boxes with 12 and 15 pieces
   b. 12 and 15 pieces
   c. Find the LCM
   d. 12: 12, 24, 36, 48, 60, …
      15: 15, 30, 45, 60, …
      LCM: 60
   e. 60
2. a. the smallest possible page number assigned for their homework
   b. 10 and 15
   c. Find the LCM
   d. 10: 10, 20, 30, 40, …
      15: 15, 30, 45, 60, …
      LCM: 30
   e. 30

What's In

1. a. the least number of biscuits that can be packed using the paper bags
   b. 15 and 25
   c. Find the LCM
   d. 15: 15, 30, 45, 60, 75, …
      25: 25, 50, 75, …
      LCM: 75
   e. 75
2. a. the least number of packs of each you need to buy
   b. 4 in a pack, 6 in a pack
   c. Find the LCM
   d. 4: 4, 8, 12, 16, 20, 24, …
      6: 6, 12, 18, 24, …
      LCM: 12
   e. 12

What's More

1. a. the smallest number of Mathematics and Science books that they can pack if these are of the same number
   b. 14 Mathematics, 10 Science
   c. Find the LCM
   d. 14: 14, 28, 42, 56, 70, …
      10: 10, 20, 30, 40, 50, 60, 70, …
      LCM: 70
   e. 70
2. a. the time that you will hear the sounds together again
   b. bell rings every 20 seconds, horn blows every 15 seconds
   c. Find the LCM
   d. 20: 20, 40, 60, …
      15: 15, 30, 45, 60, …
      LCM: 60
   e. 60 seconds: So, at 8:01 a.m., you will hear the sounds together again.

What I Can Do

1. the least number of suman that she could sell in bundles of 6 and 7
2. bundles of 6 and 7
3. Find the LCM
4. 6: 6, 12, 18, 24, 30, 36, 42, …
   7: 7, 14, 21, 28, 35, 42, …
   LCM: 42
5. 42

Assessment

1. a. the smallest possible page number that could have been given for their assignment
   b. divisible by both 11 and 8
   c. Find the LCM
   d. 11: 11, 22, 33, 44, 55, 66, 77, 88, …
      8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, …
      LCM: 88
   e. 88
2. a. the shortest height at which the two stacks will be of the same height
   b. 7 centimeters, 5 centimeters
   c. Find the LCM
   d. 7: 7, 14, 21, 28, 35, …
      5: 5, 10, 15, 20, 25, 30, 35, …
      LCM: 35
   e. 35

Additional Activities

1. a. the smallest number of books each could have arranged
   b. 8 books, 9 books
   c. Find the LCM
   d. 8: 8, 16, 24, 32, 40, 48, 56, 64, 72, …
      9: 9, 18, 27, 36, 45, 54, 63, 72, …
      LCM: 72
   e. 72

References

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