

Real Life Applications of GCF and LCM

**How can you tell if a word problem requires you
to use**

**Greatest Common Factor
or Least Common Multiple
to solve?**

GCF and LCM

Problem Solving

First, use our
PROBLEM SOLVING PROCESS

- ◆ **What do I know?**
- ◆ **What do I need to know?**
- ◆ **What is my plan?**

GCF Problems

may be asking you:

- ◆ to split things into smaller sections?
- ◆ to equally distribute 2 or more sets of items into their largest grouping?
- ◆ to figure out how many people we can invite?
- ◆ to arrange something into rows or groups?

GCF Example

- ◆ Samantha has two pieces of cloth. One piece is 72 inches wide and the other piece is 90 inches wide. She wants to cut both pieces into strips of equal width that are as wide as possible. How wide should she cut the strips?

Samantha has two pieces of cloth. One piece is 72 inches wide and the other piece is 90 inches wide. She wants to cut both pieces into strips of equal width that are as wide as possible. How wide should she cut the strips?

◆ **What do I know?**

The pieces of cloth are 72 and 90 inches wide.

◆ **What do I need to find out?**

How wide should she cut the strips so that they are the largest possible equal widths.

Samantha has two pieces of cloth. One piece is 72 inches wide and the other piece is 90 inches wide. She wants to cut both pieces into strips of equal width that are as wide as possible. How wide should she cut the strips?

- ◆ **What is my plan?**

This problem can be solved using **Greatest Common Factor** because we are cutting or “dividing” the strips of cloth into smaller pieces (**Factor**) of 72 and 90 (**Common**) and we are looking for the widest possible strips (**Greatest**).

- ◆ I will find the GCF of 72 and 90

GCF Word Problem Solution

GCF using 'List Method'

8 x 9	9 x 10
6 x 12	6 x 15
4 x 18	5 x 18
3 x 24	3 x 30
2 x 36	2 x 45
1 x 72	1 x 90

GCF using "Common Prime Factors Method"

$$72 = 2 \times 2 \times 2 \times 3 \times 3$$

$$90 = 2 \times 3 \times 3 \times 5$$

$$\text{GCF} = 2 \times 3 \times 3 = 18$$

Samantha should cut each piece to be 18 inches wide

LCM Problems

may be asking you:

- ◆ about an event that is or will be repeating over and over.
- ◆ to purchase or get multiple items in order to have enough.
- ◆ to figure out when something will happen again at the same time.

LCM Example

- ◆ Ben exercises every 12 days and Isabel every 8 days. Ben and Isabel both exercised today. How many days will it be until they exercise together again?

Ben exercises every 12 days and Isabel every 8 days. Ben and Isabel both exercised today. How many days will it be until they exercise together again?

- ◆ **What do I know?**

Ben exercises every 12 days and Isabel every 8 days and they both exercised today.

- ◆ **What do I need to know?**

How many days is it until they will both exercise on the same day again.

Ben exercises every 12 days and Isabel every 8 days. Ben and Isabel both exercised today. How many days will it be until they exercise together again?

- ◆ **What is my plan?**

This problem can be solved using **Least Common Multiple** because we are trying to figure out when the soonest (**Least**) time will be that as the event of exercising continues (**Multiple**), it will occur at the same time (**Common**).

- ◆ I will find the LCM of 8 and 12.

LCM Word Problem Solution

LCM using 'List Method'

8: 8, 16, **24**, 32, 40

12: 12, **24**,

LCM using "Prime Factorization Method"

$$8 = 2 \times 2 \times 2$$

$$12 = 2 \times 2 \times 3$$

(only use the common factors once)

$$\text{LCM} = 2 \times 2 \times 2 \times 3 = 24$$

They will exercise together again in **24** days.

QUIZ!!!!!!

- ◆ On a sheet of notebook paper, tell whether the following word problems could be solved using GCF or LCM...

Question #1

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

Question #2

- ◆ Rosa is making a game board that is 16 inches by 24 inches. She wants to use square tiles. What is the largest tile she can use?

Question #3

- ◆ Z100 gave away a Z \$100 bill for every 100th caller. Every 30th caller received free concert tickets. How many callers must get through before one of them receives *both* a coupon and a concert ticket?

Question #4

- ◆ 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?

Question #5

- ◆ Sean has 8-inch pieces of toy train track and Ruth has 18-inch pieces of train track. How many of each piece would each child need to build tracks that are equal in length?

Question #6

- ◆ I am planting 50 apple trees and 30 peach trees in rows. I want to mix the apple and peach trees in my rows, and I want each row to be the same. What is the maximum number of trees I can plant per row?

QUIZ Answers...

- ◆ 1.) GCF
- ◆ 2.) GCF
- ◆ 3.) LCM
- ◆ 4.) LCM
- ◆ 5.) LCM
- ◆ 6.) GCF

QUIZ!!!!!!

- ◆ Now...for some further practice, try to solve each of the 6 real-life application problems. Be sure to give a sentence form answer that incorporates your LCM or GCF solution.
- ◆ Here are the real-life situations once again:

Question #1

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

Question #1 ANSWER

- ◆ Mrs. Evans has 120 crayons and 30 pieces of paper to give to her students. What is the largest # of students she can have in her class so that each student gets equal # of crayons and equal # of paper.
- ◆ Answer: $GCF = 30$
Mrs. Evans could have 30 children in her class, each of whom will receive 1 piece of paper and 4 crayons.

Question #2

- ◆ Rosa is making a game board that is 16 inches by 24 inches. She wants to use square tiles. What is the largest tile she can use?

Question #2 ANSWER

- ◆ Rosa is making a game board that is 16 inches by 24 inches. She wants to use square tiles. What is the largest tile she can use?

- ◆ $GCF = 8$

The largest tile Rosa can use is 8 inches by 8 inches. She will have a total of six 8" square tiles on her game board.

Question #3

- ◆ Z100 gave away a Z \$100 bill for every 100th caller. Every 30th caller received free concert tickets. How many callers must get through before one of them receives *both* a coupon and a concert ticket?

Question #3 ANSWER

- ◆ Z100 gave away a Z \$100 bill for every 100th caller. Every 30th caller received free concert tickets. How many callers must get through before one of them receives *both* a coupon and a concert ticket?
- ◆ Answer: $\text{LCM} = 300$
The 300th caller will be the first to receive both a Z \$100 bill and a concert ticket.

Question #4

- ◆ 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?

Question #4 ANSWER

- ◆ 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?
- ◆ ANSWER: $LCM = 36$
The two bikers will meet at the starting point again in 36 minutes.

Question #5

- ◆ Sean has 8-inch pieces of toy train track and Ruth has 18-inch pieces of train track. How many of each piece would each child need to build tracks that are equal in length?

Question #5 ANSWER

- ◆ Sean has 8-inch pieces of toy train track and Ruth has 18-inch pieces of train track. How many of each piece would each child need to build tracks that are equal in length?
- ◆ ANSWER: $LCM = 72$
Sean will need 9 of his 8" track pieces and Ruth will need 4 of her 18" track pieces in order to build tracks of equal length. The length of the tracks will be 72".

Question #6

- ◆ I am planting 50 apple trees and 30 peach trees in rows. I want to mix the apple and peach trees in my rows, and I want each row to be the same. What is the maximum number of trees I can plant per row?

Question #6 ANSWER

- ◆ I am planting 50 apple trees and 30 peach trees in rows. I want to mix the apple and peach trees in my rows, and I want each row to be the same. What is the maximum number of trees I can plant per row?
- ◆ ANSWER: $GCF = 10$
I will have 10 rows and each row will have 5 apple trees and 3 peach trees.

GREAT JOB!

You are learning
to be quite the

Problem Solver!