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’**

<table>
<thead>
<tr>
<th>Product</th>
<th>8 x 9</th>
<th>9 x 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 x 12</td>
<td>6 x 15</td>
</tr>
<tr>
<td></td>
<td>4 x 18</td>
<td>5 x 18</td>
</tr>
<tr>
<td></td>
<td>3 x 24</td>
<td>3 x 30</td>
</tr>
<tr>
<td></td>
<td>2 x 36</td>
<td>2 x 45</td>
</tr>
<tr>
<td></td>
<td>1 x 72</td>
<td>1 x 90</td>
</tr>
</tbody>
</table>

**GCF using “Common Prime Factors Method”**

\[
\begin{align*}
72 & = 2 \times 2 \times 2 \times 3 \times 3 \\
90 & = 2 \times 3 \times 3 \times 5
\end{align*}
\]

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)
LCM = 2 \times 2 \times 2 \times 3 = 24

They will exercise together again in 24 days.
ON YOUR OWN!!!!!!

- On a sheet of notebook paper, tell whether the following word problems could be solved using GCF or LCM and solve them!
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?