

Pre 1.5b

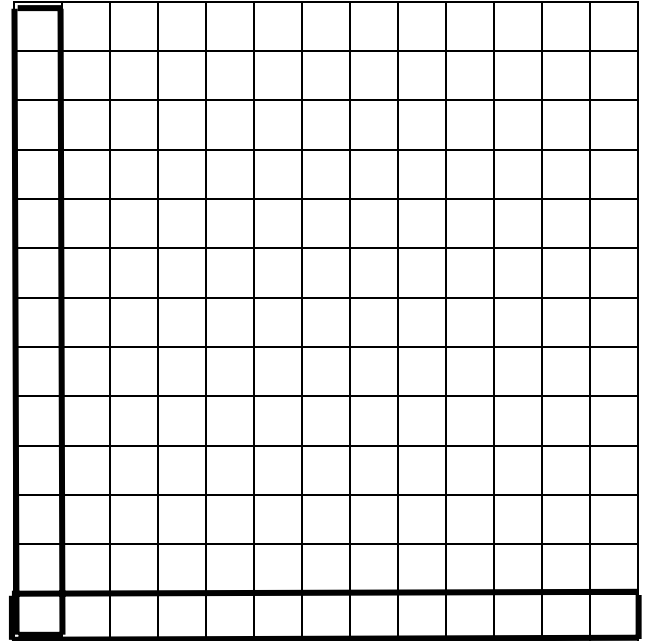
GCF and LCM

I. Factors and Symmetry

1) List the factor pair for 12. 1 x 12, 2 x 6, _____

2) Represent these ways to make 12 on the chart at the right. 1 x 12 or 12 x 1 is done for you. Color each set of factor pair rectangles a different color

3) What are your observations?

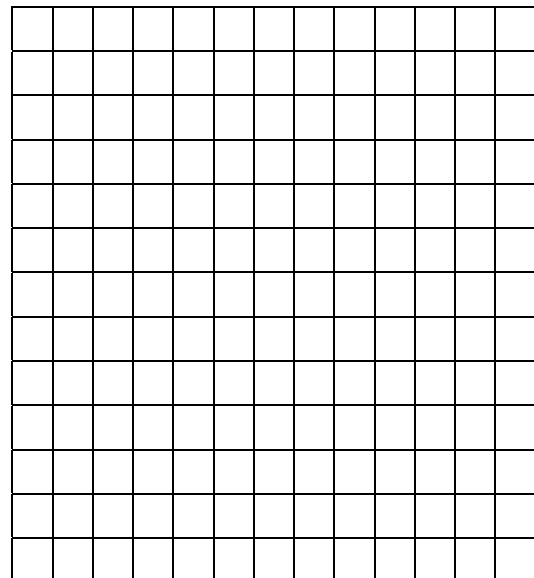
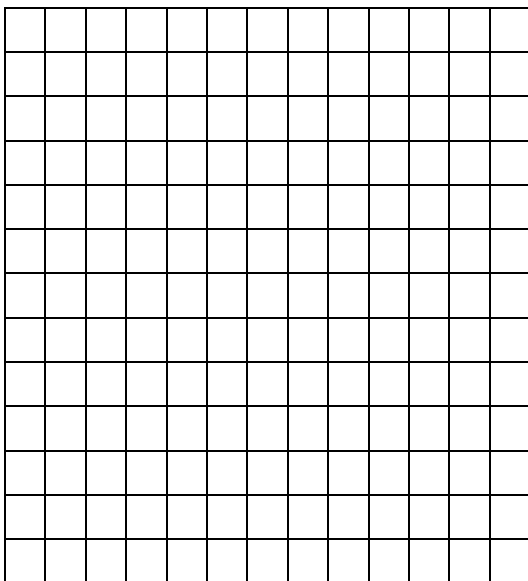


4) What do you predict about the factor pairs of other numbers?

5) Try building the factors for the following numbers:

Factor pairs of 40: _____

Factor pairs of 36: _____



6) Were your predictions correct?
What further observations do you have?

7) When looking for factor pairs of numbers, what is the secret to knowing when you have them all?

II. Multiplication Paths

- 1) Find all the paths you can to create 1,350. Begin wherever you want—then multiply the factors to travel in a path. You can move horizontally, vertically, and around corners. Hint: There are at least 15 possible pathways. You may use a calculator.

List the pathways below:

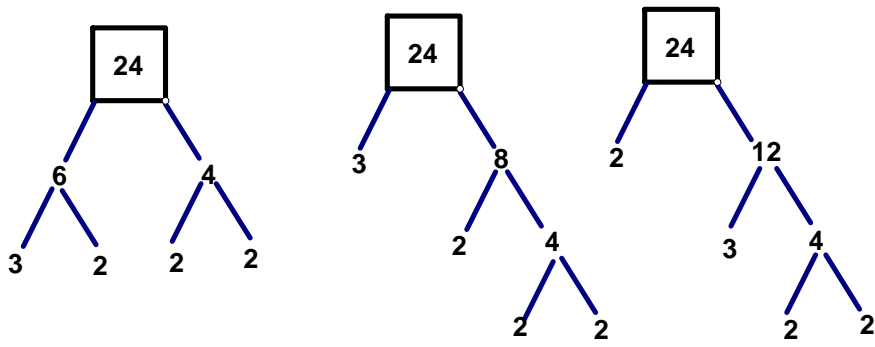
5	x	6	x	5	x	9	x	54
x	3	x	3	x	150	x	9	x
10	x	27	x	5	x	5	x	2
x	54	x	25	x	3	x	45	x
9	x	5	x	6	x	5	x	135
x	5	x	9	x	150	x	2	x
15	x	10	x	9	x	3	x	5
x	5	x	6	x	45	x	15	x
1	x	3	x	25	x	9	x	2

- 2) Once you got the first pathways, did you find any quick ways for finding other paths? Explain what you did.
- 3) Come up with a pathway, a series of numbers (a pathway which isn't on the grid) which multiply to be 1,350.

What is the longest pathway you can create which will multiply to be 1,350?

- 4) Explain this statement: When you found the longest pathway possible, you found all of the prime factors for 1,350.

5) One way to find all prime factors is to create a factor tree. Explain the factor trees below.



6) Create factor trees for the following numbers:

36

45

144

72

7) Try the following:

420

992

III. Using prime factors to find Lowest Common Multiple

1) A shipping company uses boxes which are 5 inches and 8 inches long. They ship a lot of the boxes in large crates—they don't put different length boxes in the same crate. They want to order one size crate for both size boxes. What is the shortest length crate the company can use and not have extra space in the crate? Draw your solution below.

2) Sam and Bill are friends. They like to go on bicycling trips. Sam has a larger water bottle and only stops for water every 40 mile. Bill stops every 25 miles. How many miles will they have gone before they will stop at the same place? Show your solution below.

3) The two problems above are Lowest Common Multiple problems. Explain what you think that means. Use the examples below to help you.

- Find the LCM of 3 and 4

Multiples of 3: _____

Multiples of 4: _____

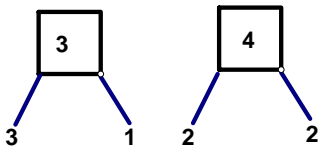
- Find the LCM of 8 and 12

Multiples of 8: _____

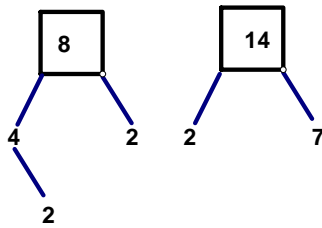
Multiples of 12: _____

4) If you had a problem in which you needed to find the LCM of 58 and 96, would you like to use the method above, or would you like a shortcut?

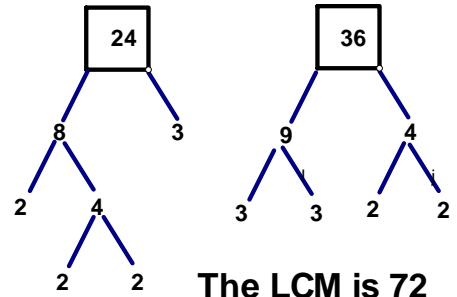
- Use the three examples below to help you figure out a way to use prime factors to help you find the lowest common multiple.
- Observe closely. Record the prime factors into the Venn diagram below. Put the prime factors which occur in both numbers in the overlap area on the Venn diagrams.



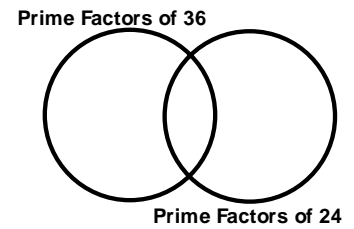
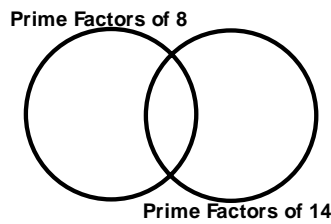
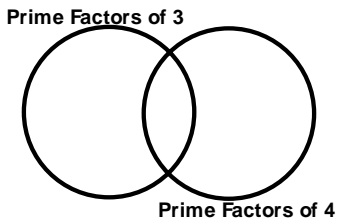
The LCM is 12



The LCM is 56



The LCM is 72



- Explain your shortcut for finding the LCM.

IV. A Different Twist: Greatest Common Factor

1) West Jordan Middle school seventh grade team had a “welcome back to school” party. They had 91 soda-pop packs and 126 boxes of popcorn. The classes were dividing up all packs and boxes evenly. There were none leftover.

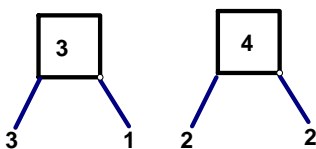
- How many classes were there? Show your thinking and how you figured out your answer.
- How many soda-pop packs did each class receive? How many boxes of popcorn?

2) In the eighth grade team, they had 90 soda-pop packs and 126 boxes of popcorn. Again, everything came out even—no leftovers.

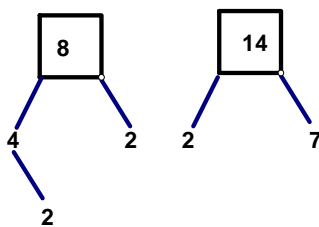
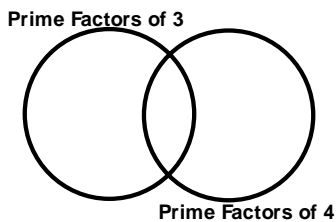
- What are the possibilities for the number of classes? Show your thinking.
- If the number of classes is the largest possible, then how many soda-pop packs did each 8th grade class receive? How many boxes of popcorn?

2) The problems above are greatest common factor problems. What does greatest common factor mean?

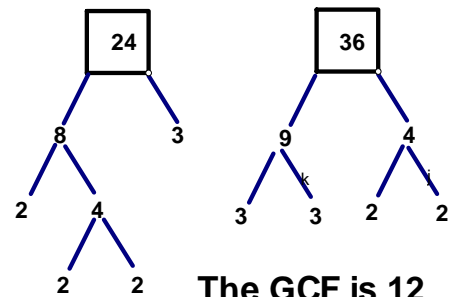
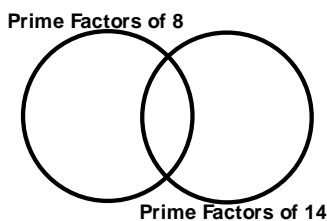
3) Again, use prime factors and Venn diagrams to help you figure out a shortcut for finding the greatest common factor.



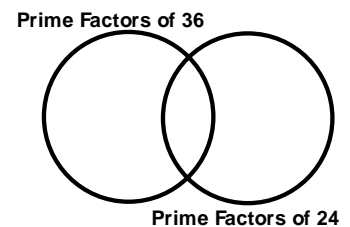
The GCF is 1



The GCF is 2



The GCF is 12

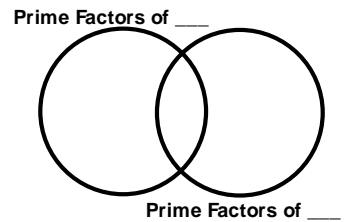
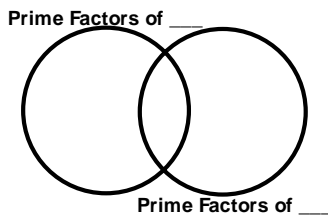
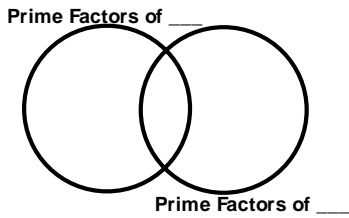
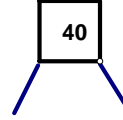
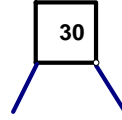
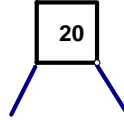
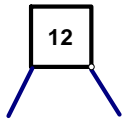
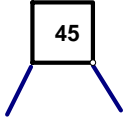
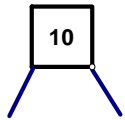


- Explain your shortcut.

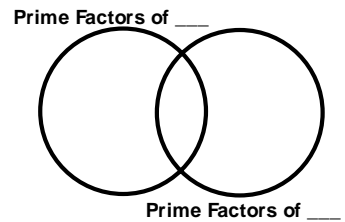
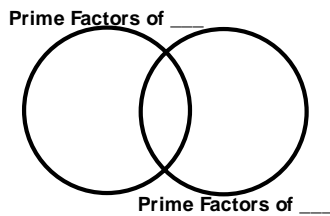
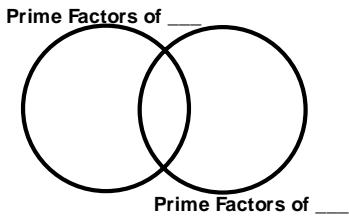
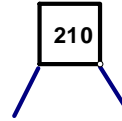
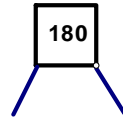
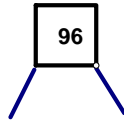
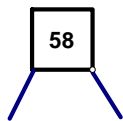
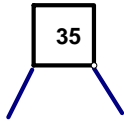
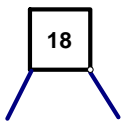
V. Practicing LCM and GCF

Part I

- Create factor trees below.
- Write the prime factors
- Show how to find the Lowest Common Multiple and Greatest Common Factor



The LCM is _____ The LCM is _____ The LCM is _____
 The GCF is _____ The GCF is _____ The GCF is _____



The LCM is _____ The LCM is _____ The LCM is _____
 The GCF is _____ The GCF is _____ The GCF is _____

Part II.

- Identify the problems below as a GCF, Greatest Common Factor problem, or an LCM, Lowest Common Multiple, problem.
- Then solve the problems. Show your work. Show how to use prime factors to solve the problems. Draw if desired.

1) Students in the drama club had a party. They had 185 mini sandwiches and 148 brownies. The drama club shared the sandwiches and brownies equally. How many members could there be?

2) In one Italian fast food restaurant, the most popular items are pizza and calzones. They are baking continually. A timer goes off for fresh baked pizza every 14 minutes. The calzones come out every 6 minutes. They all just came out at the same time. How long will it be before they come out of the oven again at the same time?

3) Two different cruise lines sail between San Francisco and Alaska in the summer time. One cruise takes 12 days to make the round trip. The other takes 2 weeks and 1 day. They are both starting their first cruise of the season on the same day. How many days will it be until they're both in dock at the same time?

4) A farmer decided to divide his sheep and cattle among his sons. He had 45 head of sheep and 72 head of cattle. The division of animals came out even. What is the largest possible number of sons the farmer could have?