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	Greatest Common Factor		<input type="checkbox"/> GCF Homework Day 1 <input type="checkbox"/> GCF Word Problems <input type="checkbox"/> Greatest Common Factor HW
	Least Common Multiple		<input type="checkbox"/> Least Common Multiple <input type="checkbox"/> Least Common Factor HW
	GCF and LCM Word Problems		<input type="checkbox"/> LCM & GCF Word Problem Characteristics <input type="checkbox"/> GCF & LCM Word Problems <input type="checkbox"/> GCF & LCM Word Problems <input type="checkbox"/> More GCF and LCM word problems <input type="checkbox"/> Quiz Review

Extra Practice:

GCF

<http://www.sheppardsoftware.com/mathgames/fractions/GreatestCommonFactor.html>

LCM

<http://www.sheppardsoftware.com/mathgames/fractions/LeastCommonMultiple.html>
<http://www.mathnook.com/math/skill/leastcommonmultiplegames.php>
<http://www.fun4thebrain.com/beyondfacts.html>

A

Factors and Prime Factorization notes

What is a prime number?

List some examples

What is a COMPOSITE number?

List some examples

What are FACTORS?

What can you multiply by to get 24?

List all the possible combinations

How many factors can a PRIME number have?

How many factors can a COMPOSITE number have?

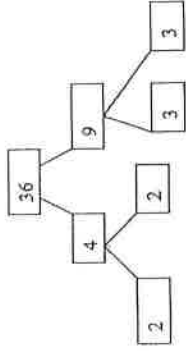
B

Notes on Prime Factorization

Prime Factorization results in a string of prime factors that are multiplied to get a product.

We will learn an easy method for finding the Prime Factorization of a number. It is called the "Tree Method."

Method 1: "Tree Method"



So.....the prime factorization of $36 = 2 \cdot 2 \cdot 3 \cdot 3$ (prime factor string)
You can also write the prime factorization in exponential form $2^2 \cdot 3^2$

STEPS:

1. Split the number into 2 factors.
2. Continue to split factors until you have only prime factors left
3. Draw "stop signs" around those prime factors.
4. Write those prime factors in a string.
5. When the prime factors are all multiplied together, they should give you the original product!

Find the prime factorization of the following numbers using trees:

1. 40
2. 18
3. 72

A

B

X

Name _____ Date _____ Block _____

Methods for listing factors of a number:

Making Rectangles to Identify Factors

Using the graph provided, show all the different rectangles you can make using the number of tiles indicated and draw them on the grid below. Complete each section of the chart after you have created all the possible number of rectangles with the given number of tiles.

Number of Tiles	Rectangles		Is this Prime or Composite Number?
	Listing Factor Pairs	Drawing	
4			
7			
12			
9			
16			
11			

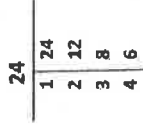
Method 1: Factor Rainbow.

Create a factor rainbow to find the factors of 24.



Method 2: Factor T-Chart.

List all of the factors of 24 using a T-Chart.



Steps for Factor Rainbow

1. Start with 1 and 24, which is the range for finding possible factors.
2. Determine if the next prime number has a factor that creates 24.
3. Continue until all of the factors are determined.

Steps for T-Chart

1. Start with 1 and 24, which is the range for finding possible factors.
2. Determine if the next consecutive number has a factor that creates 24
3. Continue until all of the factors are determined and they do not repeat.

Practices:

List all the factors of each number. You can use either the rainbow method or the T-Chart method. Factors need to be arranged in order from least to greatest.

1. 49
2. 12
3. 52
4. 75
5. 48
6. 60
7. 81
8. 16

Final Thoughts:

1. Explain how you can use rectangles to determine factors of numbers.
2. Why is it possible to draw more than two different rectangles with an area of 24 square units, but it is not possible to draw more than two different rectangles with an area of 17 square units?

A

Factors & Prime Factorization

What is a **FACTOR**? _____

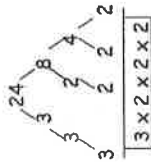
List the factors of the following numbers and tell whether the number is prime or composite.

Number	Factors	Prime or composite
14		
36		
5		
50		

What is **PRIME FACTORIZATION**? A number written as the product of its prime factors.

How do I write the prime factorization of 24 using the factor tree method?

- Choose any two factors of 24 to begin.
- Keep finding factors until each branch ends at a prime factor!



**It should look like a tree!

$$24 = 3 \times 2 \times 2 \times 2 = 3 \times 2^3$$

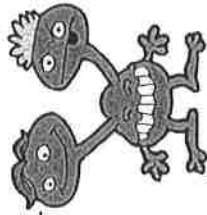
Practices:
List the prime factorization for each number

1. 21
2. 36
3. 40
4. 50
5. 27
6. 32
7. 18
8. 42
9. 100

B

Name: _____

Prime and Composite



Factors are the numbers you multiply to get another number.

Prime numbers are the numbers that have only two factors.

What are the factors of 3? 1 and 3

Because 3 has only two factors, it is a prime number.

Composite numbers are the numbers that have more than two factors.

What are the factors of 6? 1, 2, 3, and 6

Because 6 has more than two factors, it is a composite number.

Complete the table.

Number	List of Factors	Prime or composite?
10		
5		
12		
18		
41		
15		
2		
49		
73		
33		
21		

A

Why Do Pins Get Lost?

Circle each factor of the given number. Then write the letters from the boxes that do not contain factors on the line at the right.

Factors of 32	2	5	8	32	4	14	3	1	16	18
	P	T	I	F	R	H	E	A	N	Y

Factors of 24	8	1	9	12	4	3	24	18	48	6	2
	H	S	A	D	I	V	L	R	E	L	M

Factors of 10	8	5	10	3	15	2	20	100	1	4	50
	P	A	L	O	I	S	N	T	S	E	D

Factors of 48	3	8	48	12	6	16	36	2	24	1	96	4
	T	O	A	W	L	F	I	S	T	F	N	H

Factors of 64	16	32	1	24	8	4	6	64	2	128
	S	T	A	O	R	D	N	P	D	E

Factors of 31	31	62	310	11	3	7	1	2	8	16	0
	A	D	I	R	E	C	H	T	I	O	N

Factors of 42	3	21	6	14	2	16	42	4	7	84	1
	P	H	B	I	U	A	T	N	T	D	O

Factors of 27	6	9	27	54	1	270	7	13	3	0
	H	I	D	E	R	A	D	E	N	D

Factors of 80	20	8	80	4	16	2	12	5	40	6	1	10
	T	U	P	L	O	W	I	T	H	N	T	O

Factors of 70	35	7	14	3	10	70	5	140	1	0	2
	N	S	O	T	E	N	O	H	M	E	R

Factors of 75	3	15	9	1	150	25	750	4	75	5	2
	S	L	O	U	T	S	H	E	N	D	R

B

6

Why Did the Horse Eat With Its Mouth Open?



Write the prime factorization for each number. Find your answer in the adjacent answer list. Write the letter of the answer in each box containing the number of the exercise.

1	12	2	20	3	35	U	$2 \times 3 \times 5$													
4	36	5	75	6	99	B	$2^2 \times 3$													
7	60	8	56	9	26	E	5×7													
10	81	11	100	12	90	G	$2^2 \times 7$													
						H	$2^2 \times 5$													
						D	3×5^2													
						J	2×3^2													
						M	$3^2 \times 11$													
						R	$2^2 \times 3^2$													
						F	$2 \times 5 \times 11$													
						K	23×5													
						L	2×13													
						C	$2 \times 5 \times 7$													
						L	$2^3 \times 7$													
						S	$2^2 \times 3 \times 5$													
						A	$2^2 \times 5^2$													
						O	2×3^3													
						N	3^4													
						T	$2 \times 3^2 \times 5$													
						P	$2^3 \times 3 \times 5$													
9	12	2	11	5	1	11	5	7	12	11	1	8	3	6	11	10	10	3	4	7

Greatest Common Factor Notes

What does each word mean?

Greatest:

Common:

Factor:

Come up with a math definition that incorporates all three words

Greatest Common Factor:

Ex) Find the GCF of 6 and 9

List the factors of 6:

List the factors of 9:

Ex) Find the GCF of 12 and 32

Ex) Find the GCF of 6 and 27

Use a factor tree and Venn Diagram

Use an upside down birthday cake

Ex) Find the GCF of 5 and 21 (choose your method)

What happens when they don't have any numbers in common?

Ex) Jared has 12 jars of grape jam, 16 jars of strawberry jam and 24 jars of raspberry jam. He wants to place the jam into the greatest possible number of boxes so that each box has the same number of each kind of jam. How many boxes does he need? (Draw a picture)

How many of each kind of jam will go in each box?

_____ GRAPE _____ STRAWBERRY _____ RASPBERRY

How many jars are in each box? _____

Ex) There are 18 girls and 24 boys in Mrs. Andrew's gym class. To play a certain game, the students must form teams. Each team member must have the same number of boys and girls. What is the greatest number of teams Mrs. Andrew's can make if every student is on a team? (draw a picture)

How many students are on each team?

A

B

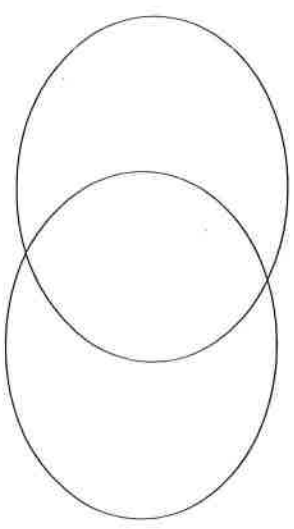
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Show your work:

Find the Greatest Common Factor of each set of numbers:

1.

Factors	Common Factors	GCF
16		
56		



Complete the Venn Diagram

GCF _____

2.

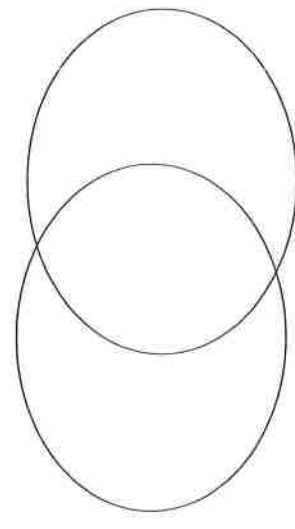
Factors	Common Factors	GCF
17		
34		

3.

Factors	Common Factors	GCF
96		
108		

4.

Factors	Common Factors	GCF
35		
65		



Complete the Venn Diagram

GCF _____

5.

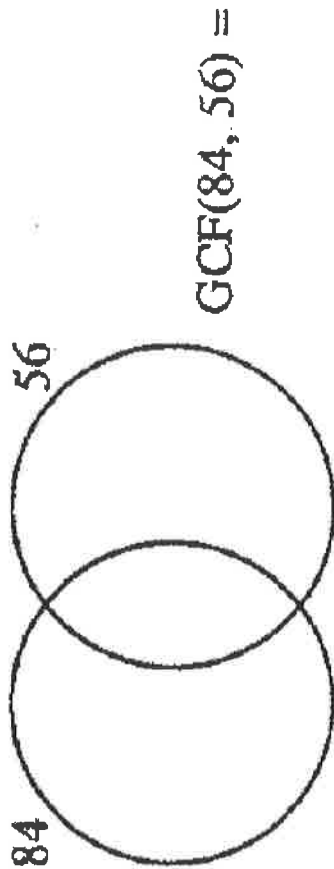
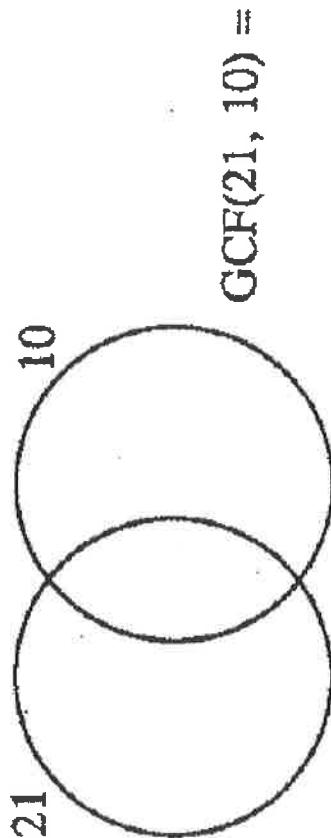
Factors	Common Factors	GCF
5		
57		
99		

GCF Homework Day 1

1. List factors of the two numbers. Circle the common ones. Find the greatest common factor.

<p>a. 20: 30: GCF:</p>	<p>b. 21: 30: GCF:</p>
<p>c. 28: 40: GCF:</p>	<p>d. 54: 30: GCF:</p>

Use a Venn diagram to find the GCF between the 2 numbers.



GCF Word Problems

1.) Coach Crawford's activity class has 12 boys and 18 girls. He wants to divide the class into equal teams so that each team has the same number of girls and same number of boys.

a. What is the greatest number of teams he can create?

b. How many girls and boys will be on each team?

2.) Stephanie sells bags of different kinds of cookies. She made \$27 selling bags of peanut butter cookies, \$18 selling chocolate chips cookies, and \$45 selling sugar cookies. Each bag of cookies costs the same amount.

a. What is the most that Stephanie could charge for each bag of cookie?

b. How many bags of each type of cookies did Stephanie sell?

3.) There are 40 girls and 32 boys who want to participate in 6th grade intramurals. Each team must have the same number of girls and the same number of boys.

a. What is the greatest number of teams that can participate intramurals?

b. How many girls and boys will be on each team?

4.) Shannon is making identical balloon arrangements for a party. She has 32 maroon balloons, 24 white balloons, and 16 orange balloons. She wants each arrangement to have the same number of each color.

a. What is the greatest number of arrangements that she can make if every balloon is used?

b. In each arrangement there will be

_____ maroon balloons

_____ white balloons

_____ orange balloons

Name _____

Date _____

Bell _____

Name _____

Date _____

Bell _____

Greatest Common Factor Homework

- 1.) Find the GCF of the following numbers:
a. 28 and 70

b. 18, 27, and 45

Greatest Common Factor Homework

- 5.) Find the GCF of the following numbers:
a. 28 and 70

b. 18, 27, and 45

- 2.) 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?

- 6.) 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?

- 3.) Jason is trying to make picnic lunches. He has 12 sandwiches, 18 apples and 30 pieces of candy. What is the greatest number of lunches that he can make if he wants each lunch to have the same number of each kind of food and use all of the food?

- 7.) Jason is trying to make picnic lunches. He has 12 sandwiches, 18 apples and 30 pieces of candy. What is the greatest number of lunches that he can make if he wants each lunch to have the same number of each kind of food and use all of the food?

- 4.) Kim packed 6 boxes with identical supplies. It was the greatest number she could pack and use all the supplies. Which of these is her supply list?

- a. 24 pencils, 36 pens, 10 rulers
- b. 12 rulers, 30 pencils, 45 pens
- c. 42 pencils, 18 rulers, 72 pens
- d. 60 pens, 54 pencils, 32 rulers

- 8.) Kim packed 6 boxes with identical supplies. It was the greatest number she could pack and use all the supplies. Which of these is her supply list?

- e. 24 pencils, 36 pens, 10 rulers
- f. 12 rulers, 30 pencils, 45 pens
- g. 42 pencils, 18 rulers, 72 pens
- h. 60 pens, 54 pencils, 32 rulers



12

Multiple:

Examples:

2 is a multiple of 2 since $2 \cdot 1 = 2$

6 is a multiple of 3 since $3 \cdot 2 = 6$

Can you think of other multiples of 2? 3?

To find LCM

1.)

2.)

LCM: Least Common Multiple

Find the LCM

1.) 6 and 8

2.) 12 and 15

Come up with a definition as a table

<https://www.youtube.com/watch?v=0YIHLUxzRr8>


How many packs of hot dogs and how many packs of hot dog buns should George Banks purchase to have a hot dog bun for every hot dog?
(same number of hot dogs and hot dog buns)

Using LCM to solve Word Problems

Donovan is buying hotdogs for a class picnic. Hotdogs are sold in packages of 10. Hotdog buns are sold in packages of 8. What is the smallest number of hot dogs and buns Donovan can buy to have an equal number of each?



Ella made a table showing the feeding schedule for her pets, a lizard and a snake. The snake is fed every six days. The lizard is fed every four days.

DAY	1	2	3	4	5	6	7	8	9	10	11	12
Snake												
Lizard 												

Both diagrams and questions were taken from Math 5.5. © "From Wholes to Parts"

- On which day will both the snake and the lizard be fed?
- What is the next day on which both will be fed?

Using LCM to solve Word Problems

Two bus services A and B arrive at a station. Service A arrives at the station every 15 minutes; service B arrives at the station every 20 minutes. The first bus arrives at the station at 8:00. When will both buses arrive at the station again?



A

B

K

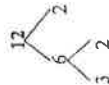
Least Common Multiples Notes

Use Venn diagrams to find the least common multiple of two numbers.

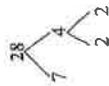
- Steps:
1. Use the factor tree method to list the prime factors of each number.
 2. Write the common prime factors in the center of the Venn diagram.
 3. List the remaining prime factors in the outside circles.
 4. Multiply all the prime factors to get the LCM

Ex: Find the LCM of 12 and 28.

Step 1:

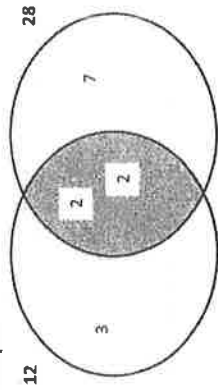


$12 = 2 \cdot 2 \cdot 3$



$28 = 2 \cdot 2 \cdot 7$

Step 2



Step 3:

$LCM = 3 \cdot 2 \cdot 2 \cdot 7 = 84$

Practice:

1. Find the LCM of 8 and 18
2. Find the LCM of 9 and 16
3. Find the LCM of 27 and 36
4. Find the LCM of 24 and 30
5. Find the LCM of 9 and 15

Name: _____

Score: _____

Least Common Multiple

Find the least common multiple of each pair of numbers.

1) 54, 14

LCM(54, 14) = _____

2) 12, 60

LCM(12, 60) = _____

3) 15, 95

LCM(15, 95) = _____

4) 38, 6

LCM(38, 6) = _____

5) 81, 9

LCM(81, 9) = _____

6) 8, 46

LCM(8, 46) = _____

7) 11, 22

LCM(11, 22) = _____

8) 36, 88

LCM(36, 88) = _____

9) 24, 78

LCM(24, 78) = _____

10) 10, 65

LCM(10, 65) = _____

A

Name _____ Date _____

Least Common Factor Homework

- 1.) Find the LCM of the following numbers:
- a. 8 and 5
 - b. 3, 4, and 12

2.) You and three friends go to lunch and find a deal on packages of 6 tacos. You want to buy the minimum number of packages so you each get the same number of tacos and none are left over. How many packages must you buy?



3.) Mary wears a jacket every four days and her hat every five days. If she wears her jacket and hat on March 20th, what is the next day she will wear both her jacket and her hat?



Hint: There are 31 days in March.

B

GCF and LCM Word Problems

List the characteristics for each type of problem.

GCF	LCM
-----	-----

Name _____ Date _____

GCF and LCM Word Problems

Solve each word problem by finding GCF or LCM.

1. Pencils come in packages of 10. Erasers come in packages of 12. Phillip wants to purchase the **smallest number of pencils and erasers** so that he will have exactly **1 eraser per pencil**. How many packages of pencils and erasers should Phillip buy?
 - A. 4 packages of pencils and 3 packages of erasers
 - B. 5 packages of pencils and 4 packages of erasers
 - C. 6 packages of pencils and 5 packages of erasers
 - D. 12 packages of pencils and 10 packages of erasers
2. Kiara baked 30 oatmeal cookies and 48 chocolate chip cookies to package in plastic containers for her friends at school. She wants to divide the cookies into identical containers so that each container has the **same number of each kind of cookie**. If she wants each container to have the **greatest number of cookies possible**, how many plastic containers does she need?
3. Boxes that are 12 inches tall are being stacked next to boxes that are 18 inches tall. What is the **shortest height** at which the two stacks will be the **same height**?
4. Beginning at 8:30 A.M., tours of the National Capitol and the White House begin at a tour agency. Tours for the National Capitol leave every 15 minutes. Tours for the White House leave every 20 minutes. How often do the tours **leave at the same time**?
 - A. Every 15 minutes
 - B. Every 30 minutes
 - C. Every 45 minutes
 - D. Every 60 minutes

- 16
5. Two neon lights are turned on at the same time. One blinks every 4 seconds and the other blinks every 6 seconds. In 60 seconds, how many times will they **blink at the same time**?

6. The table below shows the number of students in the school choir.

School Choir	
Students	Number
Girls	48
Boys	64

The choir teacher plans to arrange the students in equal rows. Only girls or boys will be in each row. What is the **greatest number of students** that could be in each row?

- A. 16
- B. 12
- C. 8
- D. 4

7. At a display booth at an amusement park, every visitor gets a gift bag. Some of the bags have items in them as shown in the table below.

Items in the Gift Bags

Items	Bags
Hat	Every 2 nd visitor
T-shirt	Every 7 th visitor
Backpack	Every 10 th visitor

How often will a bag **contain all three items**?

- A. Every 14 bags
- B. Every 19 bags
- C. Every 70 bags
- D. Every 140 bags

8. Bridget has swimming lessons every fifth day and diving lessons every third day. If she had a swimming lesson and a diving lesson on May 5, when will be the next date on which she has **both swimming and diving lessons**?

Name: _____ Class: _____ Date: _____

GCF and LCM WORD PROBLEMS

Read each problem and write GCF (Greatest Common Factor) or LCM (Least Common Multiple) in the box to show that you understand the strategy it needs. On a separate piece of paper show your working out, with the number of the question. Record your answers on this sheet, including your *unit of measurement* (e.g., inches, miles, dogs, cakes).

- Joanne is campaigning for class president and plans to distribute some campaign materials: 20 flyers and 16 buttons. She wants each classroom to receive an identical set of campaign materials, without having any materials left over. What is the greatest number of classrooms Joanne can distribute materials to?
- Serena wants to create snack bags for a trip she is going on. She has 6 granola bars and 10 pieces of dried fruit. If the snack bags should be identical without any food left over, what is the greatest number of snack bags Serena can make?
- Matthew goes hiking every 12 days and swimming every 6 days. He did both kinds of exercise today. How many days from now will he go both hiking and swimming again?
- Mandy is making emergency-preparedness kits to share with friends. She has 12 bottles of water and 16 cans of food, which she would like to distribute equally among the kits, with nothing left over. What is the greatest number of kits Mandy can make?
- Edeena is packing equal numbers of apple slices and grapes for snacks. Edeena bags the apple slices in groups of 18 and the grapes in groups of 9. What is the smallest number of grapes that she can pack?
- A club has 16 girls and 8 boys as members. The president wants to break the club into groups, with each group containing the same combination of girls and boys. The president also wants to make sure that no one is left out. What is the greatest number of groups the president can make?
- Ariel is making flower arrangements. He has 7 roses and 14 daisies. If Ariel wants to make all the arrangements identical and have no flowers left over, what is the greatest number of flower arrangements that he can make?
- Wilma is thinking of a number that is divisible by both 17 and 8. What is the smallest possible number that Wilma could be thinking of?

9. Sarah's Shipping and Ryan's Mail Services both ship packages. Sarah's trucks will only carry loads of 18 packages. In contrast, Ryan's trucks will only carry loads of 11 packages. If both businesses ended up shipping the same number of packages this morning, what is the minimum number of packages each must have shipped?

10. Nathan is stocking bathrooms at the hotel where he works. He has 18 rolls of toilet paper and 9 bars of soap. If he wants all bathrooms to be stocked identically, with the same combination of supplies in each one and nothing left over, what is the greatest combination of bathrooms Nathan can stock?

11. Tayli wishes to advertise her business, so she gives packs of 13 red flyers to each restaurant owner and sets of 20 blue flyers to each clothing store owner. At the end of the day, Tayli realizes that she gave out the same number of red and blue flyers. What is the minimum number of flyers of each color she distributed?

12. Jackson Stationery sells cards in packs of 11 and envelopes in packs of 13. If Kina wants the same number of each, what is the minimum number of cards that she will have to buy?

13. Lavinia has 9 glasses and 6 mugs. She would like to set them out in identical groups, with none left over, in preparation for a dinner party. What is the greatest number of groups Lavinia can set out?

14. Aylin is making a scrapbook using 18 photos and 20 newspaper clippings. She wants all the pages to be set up in the same way, with the same combination of photos and newspaper clippings on every page. She also wants to make sure that no items are left over. What is the greatest number of scrapbook pages that Aylin can create?

15. Hay's Linens sells hand towels in sets of 17 and bath towels in sets of 6. If the store sold the same number of each this morning, what is the smallest number of each type of towel that the store must have sold?

16. In preparation for a party, Brant is putting desserts onto platters. The chocolate cake is cut into 15 pieces and the cheesecake is cut into 6 pieces. If he wants to prepare identical platters without having any cake left over, what is the greatest number of platters he can prepare?



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More GCF and LCM Word Problem

5. Claire takes private lacrosse lessons every 6 days and piano lessons every 4 days. In 60 days, how often will she have lacrosse lessons and piano lessons on the same day?

6. Coach Crawford's activity class has 12 boys and 18 girls. He wants to divide the class into equal teams so that each team has the same number of girls and same number of boys. What is the greatest number of teams he can create?

How many girls will be on each team?

How many boys will be on each team?

7. Stephanie sells bags of different kinds of cookies. She made \$27 selling bags of peanut butter cookies, \$18 selling chocolate chip cookies, and \$45 selling sugar cookies. Each bag of cookies costs the same amount. What is the most that Stephanie could charge for each bag of cookies?

How many bags could Stephanie have sold if each bag costs \$9?

8. There are 40 girls and 32 boys who want to participate in 6th grade intramurals. If each team must have the same number of girls and the same number of boys, what is the greatest number of teams that can participate in intramurals?

How many girls and boys will be on each team?

1. Ed has 36 red jelly beans, 48 blue jelly beans, and 72 yellow jelly beans. He wants to divide them equally among his friends at the lunch table. What is the greatest number Ed can use to divide the jelly beans evenly?

- A. 6
- B. 8
- C. 12
- D. 18

2. A local radio station is having a contest in which every 12th caller receives a recently released CD and every 20th caller receives four free tickets to an upcoming concert. Which caller will be the first to receive both prizes?

3. Hamburger buns are sold in packages of 8. Hamburgers patties are sold in packages of 6. If Lynn wants to have enough to serve exactly 24 people, how many packages of hamburger buns and hamburger patties must she purchase?

- A. 8 packages of buns
6 packages of patties
- B. 6 packages of buns
8 packages of patties
- C. 4 packages of buns
3 packages of patties
- D. 3 packages of buns
4 packages of patties

4. The MMS Spirit Club marks every 4th locker with an orange star, every 6th locker with a white star, and every 9th locker with an eagle. These lockers are all side by side and numbered 1 – 50. What locker will be the first to have all three, an orange star, a white star, and an eagle?

Name: _____ Date: _____ Core: _____

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QUIZ Review: Prime, Composite, Greatest Common Factor, Least Common Multiple
Calculator Inactive

Identify each of the following numbers as prime (P), composite (C), or neither (N).

1.) 39 41 1 32

Find the greatest common factor (GCF) and least common multiple(LCM) for the set of numbers.

Show your work

2.) 12 and 36 3.) 9 and 11

GCF: _____ LCM: _____ GCF: _____ LCM: _____

Solve each problem. Show your work

5.) Miriam is making bracelets. She has 12 blue beads, 18 red beads, and 32 white beads. If Miriam wants to make identical bracelets without any beads leftover, what is the greatest number of bracelets that can make?

How many beads are in each bracelets?

6.) David takes 2 medications, a pink pill and a syrup. David has to take one pink pill every 9 days and drinks the syrup every 12 days. Today David took the pink pill and drank the syrup. How many days from now will David take both medicines on the same day?

