Name:_____  Date:___9/14/2021___

# GREATEST COMMON FACTOR

1. Common Factors: Factors ___Shared___ by two or more numbers.
2. ___Greatest___ ___Common___ ___Factor___: The greatest of the common factors (GCF).
3. GCF can be used to solve problems and ___Simplify___ fractions.
4. One way to find GCF is to ___List___ the factors and find the ___greatest___ of the common factors.

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**Find the GCF of 12 and 16**

12
1 × 12
2 × 6
3 × (4)

(4)

16
1 × 16
2 × 8
(4) × 4

**Find the GCF of 36 and 24**

36
1 × 36
2 × 18
3 × (12)
4 × 9
6 × 6

(12)

24
1 × 24
2 × (12)
3 × 8
4 × 6

---

5. Another way to find GCF is to use ___Prime___ ___Factorization___.
6. First, make a ___factor___ ___tree___ for each number.
7. Then write the ___prime___ ___factorization___ of each numbers.
8. Circle the common ___prime___ factors.
9. Then find the ___Product___ of the common factors.

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**Use prime factorization to find the GCF of 24 and 40. Create a factor tree for each number.**

24
(2) × 12
　(2) × 6
　　(2) × 3

40
(2) × 20
　(2) × 10
　　(2) × 5

2 × 2 × 2 = [8]

**Circle the common factors then find the product of them.**

2 × 2 × 2 =
4 × 2 = [8]

The GCF of 24 and 40 is 8.

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# PRACTICE: GREATEST COMMON FACTOR

**#1     What is the GCF of 50 and 35? List factors to find the answer.**

50
1 × 50
2 × 25
⑤ × 10

35
1 × 35
⑤ × 7

GCF is 5

**#2     What is the GCF of 21 and 56? List factors to find the answer.**

21
3 × ⑦

56
⑦ × 8
2 × 4
2 × 2

GCF is 7

**#3     What is the GCF of 18 and 72? Use prime factorization.**

18
1 × ⑱
2 × 9
3 × 6

GCF is 18

3)72
4)72

72
1 × 72
2 × 36
3 × 24
4 × ⑱
6 × 12
8 × 9

**#4     What is the GCF of 24 and 64? Use prime factorization.**

24
②× 12
②× 6
②× 3

64
②× 32
②× 16
②× 8
2×4
2×2

2 × 2 × 2 = 8

**#5     What is the GCF of 32 and 60 ? Use whatever method your want.**

32
1 × 32
2 × 16
④ × 8

60
1 × 60
2 × 30
3 × 20
④ × 15
5 × 12
6 × 10

GCF is 4

**#6     What is the GCF of 68 and 102 ? Use whatever method your want.**

68
②× 34
2 × ⑰

102
②× 51
3 × ⑰

2 × 17 = 34

**#7** Kayla is making gift bags for her birthday party. She has 15 packs of gum, 45 stickers and 30 bracelets. If she wants each bag to have the same number of items and she wants to use all of items, what is the greatest number of gift bags she can make?

GCF of 15, 45 and 30

Since 15 is also a factor of 45 and 30, the GCF is 15.

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# GREATEST COMMON FACTOR VOCABULARY

## Prime Factorization

### Definition

Finding all of the prime factors. Prime factors can only be divided by 1 and itself.

### Algebraic Example

36
2 × 18
2 × 9
3 × 3

$2 \times 2 \times 3 \times 3$

### Examples

$12 = 2 \times 2 \times 3$

$20 = 2 \times 2 \times 5$

All prime numbers

### Non-Examples

NOT prime

$12 = 4 \times 3$

$20 = 4 \times 5$

NOT prime

## Greatest Common Factor

### Definition

The largest factor that two numbers have in common.

### Algebraic Example

24
1 × 24
2 × 12
3 × 8
4 × 6

36
1 × 36
2 × 18
3 × 12
4 × 9
6 × 6

GCF = 12

### Examples

The GCF of 8 and 12 is 4.

The GCF of 15 and 35 is 5.

### Non-Examples

16 and 24 have common factors of 2, 4, and 8, but the GREATEST common factor is 8.

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# Least Common Multiple

1. ___MULTIPLE___: A number that is the product of that number and a nonzero whole number.

2. What are the first five multiples of 5?

   5, 10, 15, 20, 25

3. What are the first five multiples of 8?

   8, 16, 24, 32, 40

4. ___Common___ Multiples: Multiples shared by two or more numbers.

5. ___LEAST___ ___Common___ ___multiple___ (LCM): The lowest common multiple of two or more numbers.

| What are two common multiples of 8 and 4? | What are two common multiples of 5 and 10? |
|---|---|
| 8 and 16 | 10 and 20 |

6. You can use ___VENN___ diagrams or lists of factors to find LCM.

| What is the LCM of 4 and 6? Use a Venn diagram. | What is the LCM of 12 and 8? Create a list of multiples. |
|---|---|
| 4      6 <br> 4, 8, 16, 20   12, (24)   6, 18 | 12 : 12, (24), 36 <br> 8 : 8, 16, (24) <br><br> LCM = 24 |
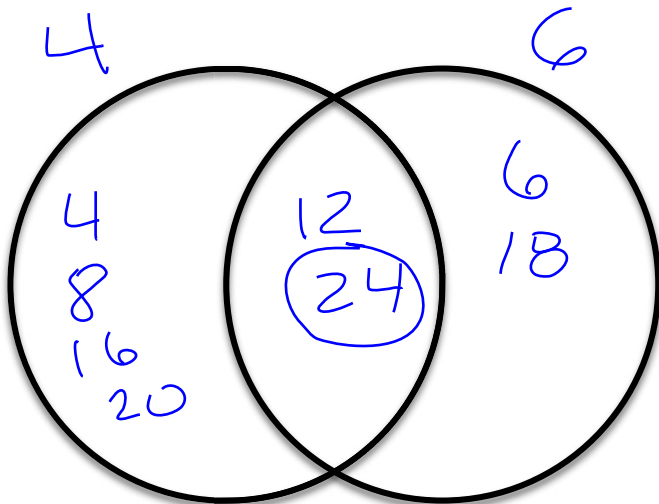
# Practice: Least Common Multiple

**Name:**_____    **Date:**_____

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**#1** **What is the LCM of 15 and and 6?**
**List multiples to find the answer.**

15 : 15, (30), 45
6 : 6, 12, 18, 24, (30)

[ 30 ]

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**#2** **What is the LCM of 8 and and 6?**
**List multiples to find the answer.**

8 : 8, 16, (24), 32
6 : 6, 12, 18, (24)

( 24 )

---

**#3** **What is the LCM of 12 and and 10? Use a Venn Diagram to find the answer.**

12          10

12
24      (60)      10
36               20
48               30
                 40
                 50

---

**#4** **What is the LCM of 7 and and 6? Use a Venn Diagram to find the answer.**

7          6

7   35        6
14            12
21     42     18
28            24
              30
              36

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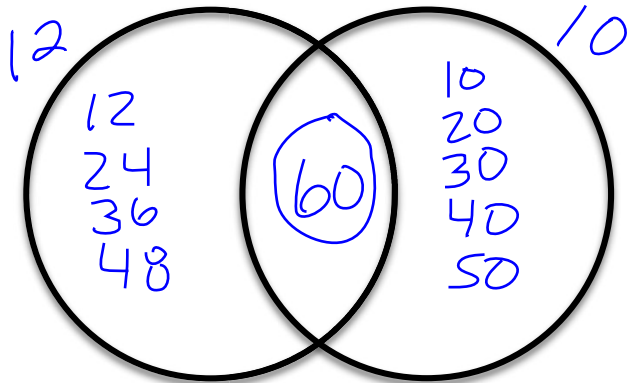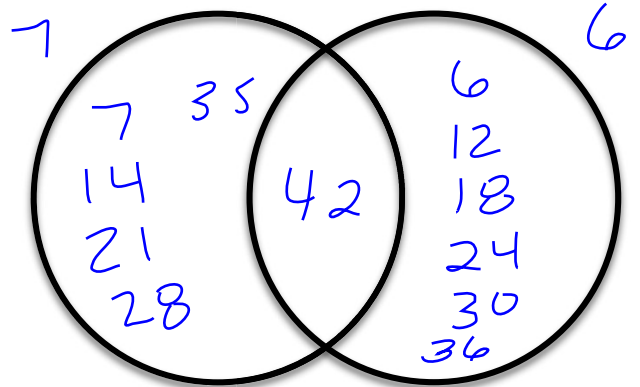
**#5** **What is the LCM of 18 and 10? Use whatever method your want.**

18, 36, 54, 72, (90)

10, 20, 30, 40, 50, 60, 70, 80, (90)

( 90 )

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**#6** **What is the LCM of 4 and 9? Use whatever method your want.**
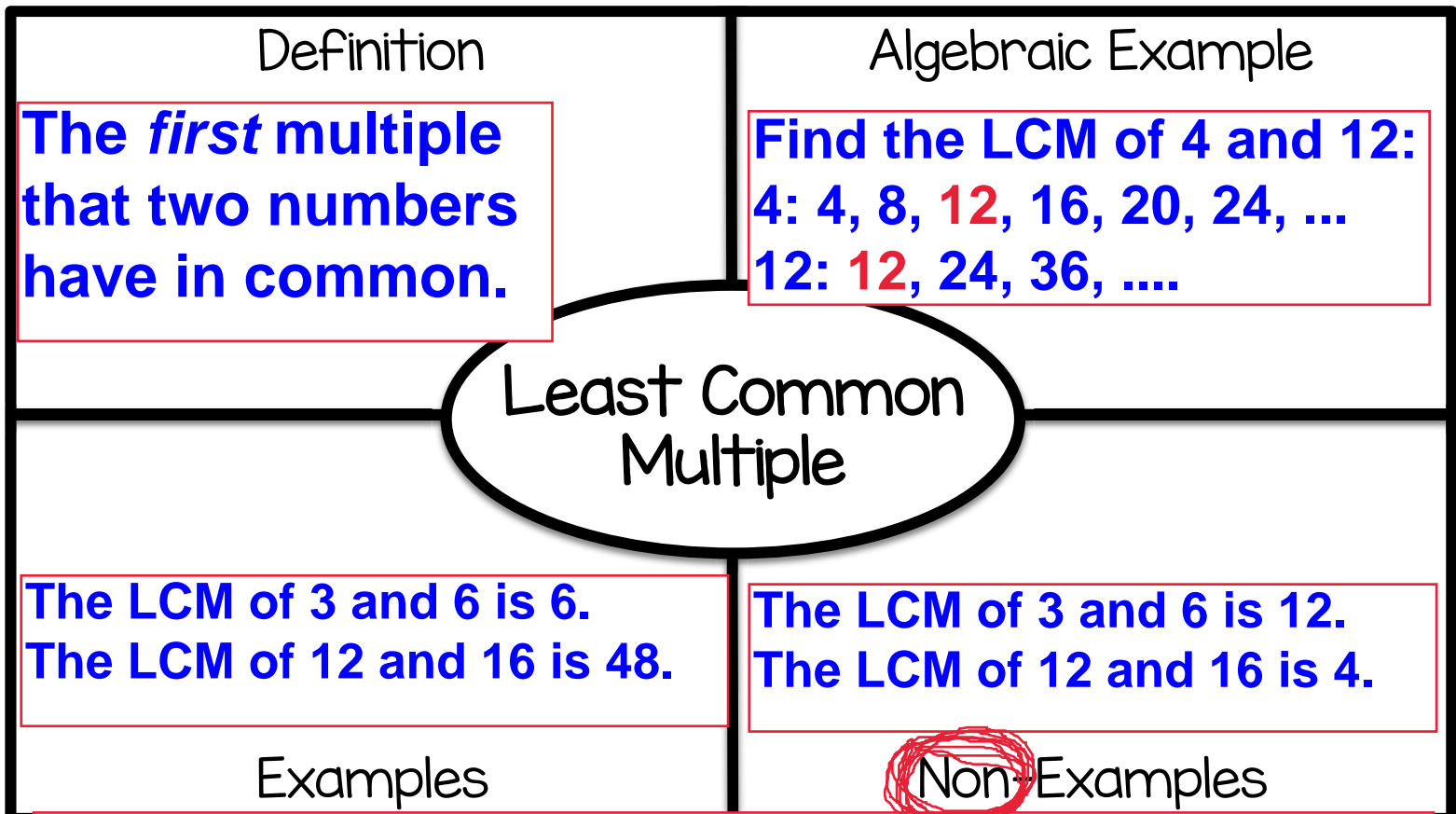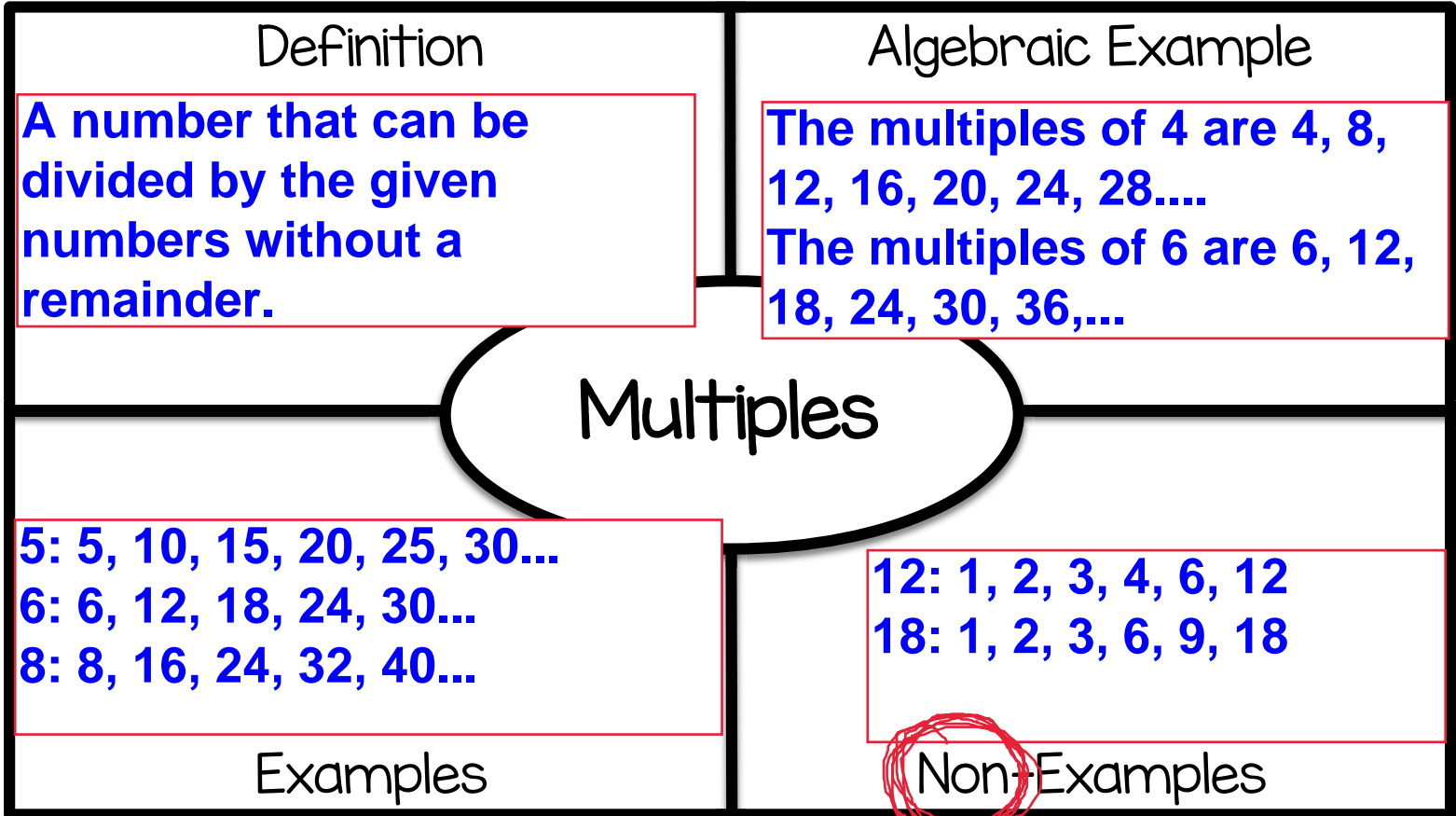
4, 8, 12, 16, 20, 24, 28, 32, (36)

9, 18, 27, (36)

( 36 )

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**#7 Joey has football practice every 3rd day and baseball practice every 7th day. If he has both football and baseball practice today, in how many days will he have them both again?**

3, 6, 9, 12, 15, 18, (21)

7, 14, (21)

( 21 days )

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# Least Common Multiple Vocabulary

| Definition | Algebraic Example |
|---|---|
| A number that can be divided by the given numbers without a remainder. | The multiples of 4 are 4, 8, 12, 16, 20, 24, 28.... The multiples of 6 are 6, 12, 18, 24, 30, 36,... |

## Multiples

| | |
|---|---|
| 5: 5, 10, 15, 20, 25, 30... <br> 6: 6, 12, 18, 24, 30... <br> 8: 8, 16, 24, 32, 40... | 12: 1, 2, 3, 4, 6, 12 <br> 18: 1, 2, 3, 6, 9, 18 |
| Examples | Non-Examples |

| Definition | Algebraic Example |
|---|---|
| The *first* multiple that two numbers have in common. | Find the LCM of 4 and 12: <br> 4: 4, 8, 12, 16, 20, 24, ... <br> 12: 12, 24, 36, .... |

## Least Common Multiple

| | |
|---|---|
| The LCM of 3 and 6 is 6. <br> The LCM of 12 and 16 is 48. | The LCM of 3 and 6 is 12. <br> The LCM of 12 and 16 is 4. |
| Examples | Non-Examples |