**Lesson 13 Notes: Greatest Common Factor**

**Answer Key**

**Fundamental Theorem of Arithmetic**

Every composite whole number can be expressed as the product of primes in exactly one way, except for the order of the factors of the product.

**PRIME Numbers**

Use the Sieve of Eratosthenes

Use Divisibility Rules

Use Prime Number Test – check up to square root

**Prime Numbers: 2, 3, 5, 7, 11, 13, 17, etc**

**Greatest Common Factor**

For any two nonzero whole numbers a and b, the greatest common factor, written GCF (a, b) is the greatest factor (divisor) of both a and b.

**GCF(10,40)**

**10=1, 10, 2, 5**

**40=1,40,2,20,4,10,5,8**

**GCF(10,40)=10**

How do you find GCF?

1. Find all factors of both numbers
2. Select the factors that are common to both numbers
3. Choose the greatest of these common factors

**GCF(10,40)**

**10=2\*5**

**40=2\*2\*2\*5**

**GCF(10,40)=2\*5=10**

Another way to find GCF:

1. Find the prime factorization of both numbers
2. Select the prime factors that are common to both numbers
3. MULTIPLY the common prime factors together to get the GCF

**Example:** Find the Greatest Common Factor for the numbers. Show your work!

**Example A:**  **Example B:**

GCF(24,36) GCF= 12 GCF(245,315) GCF= 35

**GCF(245,315)**

**245=5\*7\*7**

**315=3\*3\*5\*7**

**GCF(245,315)=5\*7=35**

**GCF(24,36)**

**24=2\*2\*2\*3**

**36=2\*2\*3\*3**

**GCF(24,36)=2\*2\*3=12**

**Example C:** **Example D:**

GCF(180,220) GCF= 20 GCF (156,198) GCF= 6

**GCF(156,198)**

**156=2\*2\*3\*13**

**198=2\*3\*3\*11**

**GCF(156,198)=2\*3=6**

**GCF(180,220)**

**180=2\*2\*3\*3\*5**

**220=2\*2\*5\*11**

**GCF(180,220)=2\*2\*5=20**