

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Learning Goal 3.2**

Given a number or set of numbers, identify the prime factorization of each element and use it to find the GCF, LCM, perfect squares or cubes and/or factored form.

**Factor**

A number that divides the term evenly.  
- a product of factors will equal the term.

**Multiple**

Any integer multiplied by your term.  
- the term becomes a factor of the multiple.

**Prime Factorization**

Writing the coefficient as a product of prime numbers.

**Example** Find the lowest common multiple (LCM) and the greatest common factor (GCF) of 6 and 15.

$$\text{GCF}(6, 15) = 3$$

$$\text{LCM}(6, 15) = 30$$

↑  
if you just see it

$$6 = 2 \times 3$$

$$15 = 3 \times 5$$

$$\text{GCF} = \cancel{2^0} \times 3^1 \times \cancel{5^0}$$

$$= 3$$

$$\text{LCM} = 2^1 \times 3^1 \times 5^1$$

let's build it!

**Example** Find the GCF of 220 and 860 without a calculator.

$$220 = 2^2 \times 5 \times 11$$

$$860 = 2^2 \times 5 \times 43$$

$$\begin{array}{c} 10 \quad 22 \\ \wedge \quad \wedge \\ 2 \quad 5 \quad 2 \quad 11 \end{array}$$

$$\begin{array}{c} 10 \quad 86 \\ \wedge \quad \wedge \\ 2 \quad 5 \quad 43 \quad 2 \end{array}$$

$$\text{GCF}(220, 860) = 2^2 \times 5^1 = 20$$

$$\text{LCM}(220, 860) = 2^2 \times 5^1 \times 11^1 \times 43^1$$

**Example** Find the GCF of 120, 906 and 1400 without a calculator.

**Example** Find the LCM of 21 and 45 without a calculator.

**Example** Find the LCM of 15, 20, 24 and 27 without a calculator.

**Example** Write the following fraction in lowest terms without a calculator.

$$\frac{2145}{1105}$$