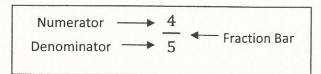
# FRACTION BASICS

#### Definitions:

Fraction: A way of showing the part of a whole. The "whole" could be one of something, like a pie or an hour, or it could be one group or set, such as a classroom of students or a store's customers.



- Numerator: The number of parts of interest.
- Denominator: The number of equal parts the whole contains.
- Proper Fraction: The numerator is smaller than the denominator.
- Improper Fraction: The numerator is as large or larger than the denominator. In algebra, an improper fraction is acceptable.
- Mixed Number: A number containing both a whole number and a fraction.
- Equivalent Fractions: Two fractions that represent the same quantity, but look different.
- Reduce a Fraction: Divide both numerator and denominator by the same number.
- Lowest Terms: A fraction which cannot be reduced further.

Fundamental Principle of Fractions: If the numerator and denominator of a fraction are multiplied by the same number, then they are equivalent fractions. The same is true if you divide by the same number.

#### Fraction Facts:

- The fraction bar means division.
- Make a fraction out of a whole number by putting it over 1.
- Any number over itself equals one.
- A fraction with a zero numerator equals zero.
- A fraction with a zero denominator is meaningless.

## **Expand a Fraction**

Multiply both the numerator and denominator by the same number.

Example: Expand  $\frac{3}{5}$  to have a denominator of 15.

First, figure out what 5 needs to be multiplied by to get 15.  $(15 \div 5 = 3)$  Next multiply both numerator and denominator by that number. Do not reduce.

$$\frac{3}{5} \cdot \frac{3}{3} = \frac{9}{15}$$

### Reduce a Fraction

Dividing both the numerator and denominator by the same number to put the fraction in lowest terms.

Example: Reduce  $\frac{20}{45}$  to lowest terms.

Both numerator and denominator are divisible by 5.

$$\frac{20 \div 5}{45 \div 5} = \frac{4}{9}$$

Change a Mixed Number to an Improper Fraction Multiply the denominator times the whole number. then add the numerator. This becomes the new numerator and the denominator stays the same.

Example: Change  $3\frac{1}{4}$  to an improper fraction.  $3\frac{1}{4} = \frac{4 \cdot 3 + 1}{4} = \frac{13}{4}$ 

Change an Improper Fraction to a Mixed Number Divide the denominator into the numerator. The answer (excluding any remainder) becomes the whole number. The remainder is the new numerator. The denominator remains the same.

Example: Change  $\frac{29}{4}$  to a mixed number.  $4 \overline{\smash)29} \quad \text{with remainder = 1.}$   $\frac{29}{4} = 7\frac{1}{4}$ 

$$4)29 \quad \text{with remainder = 1.}$$

$$\frac{29}{29} = 7^{\frac{1}{2}}$$