## Unit 18 Ratios and Rates

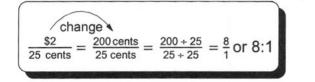
- 1. A ratio compares two like quantities.
  - A. The ratio of 3 feet to 1 foot may be expressed three ways.







- B. Like any fraction, the numbers of a ratio may be multiplied or divided by the same number without changing the value of the ratio.
- C. Ratios, like fractions, should be simplified (reduced to lowest terms).
  - 1.  $\frac{6}{2}$  reduces to  $\frac{3}{1}$
  - 2. 3:1 means the first item is three times the size of the second item.
- D. The units of measure of a ratio should be the same.
  - 1. Different measurements require one be changed before comparing.
  - 2. Example: Express \$2 to 25 cents as a ratio.



**Note:** \$2 is 8 times the size of 25 cents.

- 2. A rate is a ratio comparing two unlike quantities.
  - A. Rates are used to express many important relationships such as:
    - 1. Rate of pay in dollars per hour.

A person making \$48 for 8 hours work expressed as a rate would be  $\frac{$48}{8 \text{ hours}} = \frac{$6}{1 \text{ hour}} \text{ or $6 per hour.}$ 

2. Rate of speed in miles per hour.

Traveling 200 miles in 4 hours expressed as a rate would be  $\frac{200 \text{ miles}}{4 \text{ hours}} = \frac{50 \text{ miles}}{1 \text{ hour}} \text{ or } 50 \text{ miles per hour.}$ 

3. Price of food in cost per pound.

Three pounds of hamburger costing \$5.67 expressed as a rate would be  $\frac{\$5.67}{3 \text{ pounds}} = \frac{\$1.89}{1 \text{ pound}} \text{ or }\$1.89 \text{ per pound.}$ 

B. Rates should be reduced.