

## 8.1 Ratios

Comparing  
two numbers of the  
same unit

3 ways to write

$$\frac{a}{b} \quad a:b \quad a \text{ to } b$$

18 trucks, 6 SUVs, 4 minivans, 12 cars

$$\frac{\text{trucks}}{\text{minivans}} = \frac{18}{4}$$

$$\frac{18}{40}$$

$$\frac{\text{SUV}}{\text{cars}} = \frac{6}{12}$$

part to part

part to total

7 girls, 8 boys

$$\frac{16}{30} = \frac{8}{15} \neq \frac{15}{8}$$

## Equivalent Ratios

$$\frac{16}{30} = \frac{8}{15}$$

$$\frac{18}{4} = \frac{9}{2}$$

We don't change  
Ratios to mixed  
numbers

$$\frac{4}{5} = \frac{x}{25}$$

$$x = 20$$

$$\frac{3}{4} = \frac{?}{16} \quad ? = 12$$

$$\frac{3}{y} = \frac{51}{34}$$

$$y = 2$$

Compare

$$\frac{7.5}{15} > \frac{9}{17}$$

136

135

1. Common  
Denominator

2. Equivalent  
Values  $\left(\frac{1}{2}\right)$

## 8.2 Rates

Comparison of two  
different units

speed      day

time

wright

people

How far you travel in a given time

$$\frac{360 \text{ mi}}{6 \text{ hrs}} \quad \frac{7.29}{30 \text{ apples}}$$

$$\frac{\$450}{30 \text{ hrs}} \quad \frac{550 \text{ people}}{11 \text{ hours}}$$

### Unit Rate

- Rate in which the Denominator is 1
- Rate per 1 unit

$$\frac{60 \text{ mi}}{1 \text{ hr}} \quad 60 \text{ mph}$$

$$\frac{\$15}{1 \text{ hr}} \quad \$15/\text{h}$$

$$\frac{7.29 \div 30}{30 \div 30} = \frac{0.243}{1}$$

$$\frac{\$0.24/\text{apple}}{30} \quad 30 \overline{) 7.290}$$

$$\begin{array}{r} 0.243 \\ 30 \overline{) 7.290} \\ \underline{60} \phantom{0} \\ 129 \phantom{0} \\ \underline{120} \phantom{0} \\ 90 \\ \underline{90} \\ 0 \end{array}$$

### Using unit Rates

120 miles to Mhd from Stephen  
Speed limit is 60 miles per hr

$$\frac{60}{1} = \frac{120}{2 \text{ hrs}}$$

cost \$1.50/lb and I buy 15 lbs

$$\frac{1.50}{1 \text{ lb}} = \frac{\$22.50}{15 \text{ lbs}}$$

$$\begin{array}{r} 1.50 \\ \times 15 \\ \hline 750 \\ 1500 \\ \hline 2250 \end{array}$$

### Compare Unit Rates

cost

$$\frac{\$7.20}{60 \text{ oz box}}$$

$$\frac{4.80}{32 \text{ oz}}$$

$$60 \overline{) 720} \quad .12$$

$$\begin{array}{r} .12 \\ 60 \overline{) 720} \\ \underline{60} \phantom{0} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

$$.12/\text{oz}$$

$$32 \overline{) 480} \quad .15$$

$$\begin{array}{r} .15 \\ 32 \overline{) 480} \\ \underline{32} \phantom{0} \\ 160 \\ \underline{160} \\ 0 \end{array}$$

$$.15/\text{oz}$$

### Ratios Rates

P 404-405

4, 8, 12, 16, 20, 24, 28, 29-33 & 11

Q 409-411

4, 8, 12, 16, 20, 24, 28, 32, 36, 40