

## NOTES: Ratios and Rates

Ratio	<p>A comparison of two quantities (amounts)</p> <p>Example: Will made 7 free throws in 10 attempts. (You are comparing the number of free throws that he made to the number that he attempted.)</p>
Ways to write ratios	<p>7 to 10 7 out of 10 7 : 10 <math>\frac{7}{10}</math> → <b>Most common</b></p>
Ratios are similar to fractions but they are not fractions!!!	<p>Ratios <u>can</u> be <u>simplified</u> Ratios <u>cannot</u> be changed to mixed numbers Must leave a <u>denominator of 1</u> in ratios</p> <p>**Do not read them as fractions - read them as comparisons! "7 to 10" and NOT "Seven tenths"</p>
Rate	<p>A ratio that compares quantities measured in different units</p> <p>Example: Jane drove 75 miles in 3 hours</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <math display="block">\frac{\text{miles}}{\text{hour}} = \frac{75}{3} = \frac{25}{1}</math> </div> <div style="margin-right: 20px;"> <math display="block">3 \overline{) 75}</math> <math display="block">\underline{60}</math> <math display="block">15</math> <math display="block">\underline{15}</math> <math display="block">0</math> </div> <div style="border: 1px solid red; padding: 5px; margin-left: 20px;"> <p>25 miles per hour</p> </div> </div> <div style="border: 1px solid red; border-radius: 50%; padding: 10px; margin-left: 20px; color: red;"> <p>* Divide to figure out how many miles for one hour</p> </div>
Unit rate	<p>A rate where the "denominator" (second #) is a 1. "How many _____ per 1 _____?"</p>
How to calculate unit rate	<p>Divide both the "numerator" and "denominator" by the "denominator"</p>
Examples of unit rate	<p>1) Gordon memorized 560 vocabulary words in 28 days.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <math display="block">\frac{\text{words}}{\text{days}} = \frac{560}{28} = \frac{20}{1}</math> </div> <div style="margin-right: 20px;"> <math display="block">28 \overline{) 560}</math> <math display="block">\underline{560}</math> <math display="block">00</math> </div> </div> <p>Word form: <span style="border: 1px solid red; padding: 2px;">20 words per day</span></p> <div style="border: 1px solid red; border-radius: 50%; padding: 10px; margin-left: 20px; color: red;"> <p>* Divide to figure out how many words in one day</p> </div>

2) Pete added 12 ounces of chocolate chips to a recipe that made 48 cookies.

$$\frac{12 \text{ OZ}}{48 \text{ Cookies}} = \frac{.25}{1}$$

$$48 \overline{) 12.00} \begin{array}{r} .25 \\ \underline{9.60} \\ 240 \\ \underline{240} \\ 0 \end{array} \text{ or } \frac{1}{4}$$

Word form:  $\frac{1}{4}$  ounce per cookie

Better Buy

Something is a better buy if you pay less per 1 "item"

Example:

Jonie paid \$25.40 for 10 gallons of gasoline.  
Andre paid \$33.28 for 13 gallons of gasoline.

Who got the "better buy?"

First, find out the unit rate. (How much per 1 gallon)

Jonie:

$$\frac{\$25.40}{10 \text{ gallons}} = \frac{\$2.54}{1 \text{ gallon}}$$

$$10 \overline{) 25.40} \begin{array}{r} 2.54 \\ \underline{20} \\ 54 \\ \underline{50} \\ 40 \end{array}$$

Andre:

$$\frac{\$33.28}{13 \text{ gallons}} = \frac{\$2.56}{1 \text{ gallon}}$$

$$13 \overline{) 33.28} \begin{array}{r} 2.56 \\ \underline{26} \\ 72 \\ \underline{65} \\ 78 \\ \underline{78} \\ 0 \end{array}$$

Even though Andre got 13 gallons which is more than Jonie's 10 gallons, Andre paid more per 1 gallon.

You want to pay less money per 1 gallon because then you are not spending as much!!

**Jonie got the better buy.**

When dealing with money in a unit rate problem...

always put the money on the top of the ratio.

(Find \$ per 1 item)