



## Math 67 Unit 2

# Rate, Ratio & Proportional Reasoning Using Equivalent Fractions

## References

### Helpful Links:

<http://thinkingblocks.com>

<http://www.khanacademy.org>

<http://www.arcademyskillbuilders.com>

<http://hoodamath.com>

<http://www.purplemath.com/modules/ratio.htm>

<http://www.ixl.com/math/grade-5/compare-and-convert-customary-units>

<http://www.sheppardsoftware.com/math.htm>  
(MEASUREMENT: length, weight, volume, and more...)

### Georgia Math Grade 6 Plus Textbook

#### Connection:

Ch. 2: Lessons 1-10

### Georgia Math Grade 6 Plus Textbook Online:

[connected.mcgraw-hill.com](http://connected.mcgraw-hill.com)

<https://www.mheonline.com/apps/>

## Dear Parents

In this unit students will be introduced to ratios and proportions. Students will have practice identifying ratios from pictures, graphs, models and word problems. Using these skills, students will then be able to identify proportional ratios and use ratios to describe proportional situations as well as to predict outcomes.

## Concepts Students will Use & Understand

- A ratio is a number that relates two quantities or measures within a given situation in a multiplicative relationship (in contrast to a difference or additive relationship). The relationships and rules that govern whole numbers, govern all rational numbers.
- Making explicit the type of relationships that exist between two values will minimize confusion between multiplicative and additive situations.
- Ratios can be express comparisons of a part to whole, ( $a/b$  with  $b \neq 0$ ), for example, the ratio of the number of boys in a class to the number of students in the class.
- The ratio of the length to the width of a rectangle is a part-to-part relationship.
- Understand that fractions are also part-whole ratios, meaning fractions are also ratios. Percentages are ratios and are sometimes used to express ratios.
- Both part-to-whole and part-to-part ratios compare two measures of the same type of thing. A ratio can also be a rate.
- A rate is a comparison of the measures of two different things or quantities; the measuring unit is different for each value. For example if 4 similar vans carry 36 passengers, then the comparison of 4 vans to 36 passengers is a ratio.
- All rates of speed are ratios that compare distance to time, such as driving at 45 miles per hour or jogging at 7 minutes per mile.
- Ratios use division to represent relations between two quantities.

## Vocabulary

- **Percent:** A fraction or ration in which the denominator is 100
- **Proportion:** An equation which states that two ratios are equal.
- **Rate:** A comparison of two quantities that have different units of measure
- **Ratio:** compares quantities that share a fixed, multiplicative relationship.
- **Rational number:** A number that can be written as  $a/b$  where  $a$  and  $b$  are integers, but  $b$  is not equal to 0.
- **Unit Ratio (unit rate):** are ratios written as some number to 1.
- **Quantity:** is an amount that can be counted or measured.

Try <http://intermath.coe.uga.edu/dictionary/homepg.asp> or <http://www.amathsdictionaryforkids.com/> for further examples.

## Symbols

A ratio can be expressed three ways:

- Using the fraction bar as in  $\frac{2}{3}$
- Using a colon symbol as in 2:3
- Using the word “to” as in 2 to 3.

## Example 1

The table below shows the number of Beyblades that each student purchased. For every Beyblade that Alex purchased, who purchased three times as many?

Student	Number of Beyblades
Alex	18
Taj	36
Geoff	54
Carlos	27
Ankit	45

## Example 2

The ratio of gazelles to lions at the African Safari Theme Park is 5 to 6. Which shows an equivalent ratio?

- A** 10 gazelles to 12 lions
- B** 15 gazelles to 19 lions
- C** 20 gazelles to 25 lions
- D** 24 gazelles to 28 lions

## Example 3

There are 1200 students in a school. 60% of them are girls. How many more girls than boys are there?

## Example 4

A newborn baby weighed 128 ounces. What is the baby’s weight in pounds and ounces?

## Key

### Example 1

Geoff purchased 3 times as many Beyblades as Alex.

$$\frac{1}{18} = \frac{3}{54}$$

$\begin{array}{c} \xrightarrow{\times 3} \\ \xleftarrow{\times 3} \end{array}$

### Example 2

10 gazelles to 12 lions represent an equivalent ratio

$$\frac{5}{6} = \frac{10}{12}$$

$\begin{array}{c} \xrightarrow{\times 2} \\ \xleftarrow{\times 2} \end{array}$

### Example 3

10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	=	100%
120	120	120	120	120	120	120	120	120	120	=	1200

Girls (720) – Boys (480) = 240

There are 240 more girls than boys.

### Example 4

$$\frac{\text{ounces}}{\text{pounds}} \quad \frac{16}{1} = \frac{128}{p}$$

$\begin{array}{c} \xrightarrow{\quad} \\ \xleftarrow{\quad} \end{array}$

The newborn baby weighed 7 pounds 13 ounces.