**Volume 1 Issue 10**

Math 6/7

Unit 10 Ratios and Proportional Relationships

Dear Parents,

Below is information regarding Unit 10, Ratios and Proportional Relationships. Look for additional newsletters for future units.

***By the end of this unit, students will:***

* Compute the unit rate.
* Solve unit rate problems that have fractional quantities.
* Determine if two ratios are in proportion (equivalent).
* Write and solve an equation from a proportional relationship.
* Solve multistep ratio problems using proportions. Focus on simple interest, tax, markups/downs, gratuities and commissions, and fees.
* Compute the actual size of a figure from a scale drawing.

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**Vocabulary**

**Constant of proportionality**: The constant value of the ratio of two proportional quantities x and y; usually written y = kx, where k is the constant of proportionality. In a proportional relationship, y=kx, k is the constant of proportionality, which is the value of the ratio between y and x.

**Direct Proportion (Direct Variation)**: The relation between two quantities whose ratio remains constant. When one variable increases the other increases proportionally: When one variable doubles the other doubles, when one variable triples the other triples, and so on. When A changes by some factor, then B changes by the same factor: *A=kB*, where k is the constant of proportionality.

**Multiplicative inverse**: Two numbers whose product is 1. Example: and are multiplicative inverses of one another because × = × = 1.

**Proportion**: An equation stating that two ratios are equivalent.

**Ratio**: A comparison of two numbers using division. The ratio of a to b (where b ≠ 0) can be written as a to b, as , or as a:b.

**Scale factor:** A ratio between two sets of measurements.

**Unit Rate:** the ratio or comparison of two measurements in which the denominator or 2nd measurement is equal to one.

[*http://intermath.coe.uga.edu/*](http://intermath.coe.uga.edu/)

## Textbook Connection

**McGraw Hill Georgia Math Grade 7**: Chapter 5 Lessons 1-7, 9 and Chapter 6

**McGraw Hill Textbook Online:** connected.mcgraw-hill.com

Web Resources

* [Decimal Operations](http://mathbitsnotebook.com/JuniorMath/FractionsDecimals/FDdecimals.html)
* [Ratios](https://mathbitsnotebook.com/JuniorMath/RatioProportion/RPRatios.html)
* [Rates](https://mathbitsnotebook.com/JuniorMath/RatioProportion/RPRates.html)
* [Solving Proportions](https://mathbitsnotebook.com/JuniorMath/RatioProportion/RPProportions.html)
* [Constant of Proportionality](https://mathbitsnotebook.com/JuniorMath/RatioProportion/RPConstantProp.html)
* [Simple Interest](http://www.mathsisfun.com/money/interest.html)
* [Tax](http://www.math-play.com/Sales-Tax/Sales-Tax.html)
* [Math Dictionary for Kids](http://www.amathsdictionaryforkids.com/dictionary.html) (online)
* [Intermath](http://intermath.coe.uga.edu/dictnary/homepg.asp) (Interactive Mathematics Dictionary for middle school)

**Instructional Videos:**

* [Unit Rates and Unit Ratios](http://www.mathvillage.info/node/71)
* [Fraction Tutorials](http://www.mathvillage.info/node/86)
* [Similar Figures and Proportions](http://mathvillage.info/node/94)

**Written Tutorials:**

* [Word Problems - Proportions](http://www.algebralab.org/Word/Word.aspx?file=Algebra_Proportions.xml)

1. = ; 1 gallon of gas costs $3.50
2. $17.50(0.15) ≈ $2.63
3. , x = 10 feet; , x = 12 feet; the actual room dimensions are 10’ x 12’

|  |  |
| --- | --- |
| **Number of Packs of Gum** | **Cost in Dollars** |
| 0 | 0 |
| 1 | 2 |
| 2 | 4 |
| 3 | 6 |
| 4 | 8 |

**Equation:** 𝑑 = 2𝑔, where *d* is the cost in dollars and g is the packs of gum.

1. Find the unit rate & explain what it represents: 5 gallons of gas cost $17.50.
2. A meal at Applebee’s came to $17.50. How much would a 15% tip be for the server?
3. A scale drawing of a room measures 5” x 6”. If 1 inch = 2 feet, then what are the actual dimensions of the room?
4. The graph below represents the cost of gum packs as a unit rate of $2 dollars for every pack of gum. The unit rate is represented as $2 per pack. Represent the relationship using a table and an equation.



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### Practice Problems

**Company Name**

**Street Address**

**City, State 00000**