



MATH NEWS



LAFAYETTE
PARISH SCHOOL SYSTEM

Grade 6, Module 1, Topic A

6th Grade Math

Module 1: Ratios and Unit Rates

Math Parent Letter

This document is created to give parents and students a better understanding of the math concepts found in Eureka Math (© 2013 Common Core, Inc.) that is also posted as the Engage New York material which is taught in the classroom. Module 1 of Eureka Math (Engage New York) introduces the concepts of ratio and rate to 6th graders. Their previous experience solving problems involving multiplicative comparison serves as the conceptual foundation for understanding ratios as a multiplicative comparison of two or more numbers used in quantities or measurement.



Focus Area Topic A:

Representing and Reasoning About Ratios

Words to Know:

Ratio - A pair of nonnegative numbers, A:B, where both are not zero, and that are used to indicate that there is a relationship between two quantities such that when there are A units of one quantity, there are B units of the second quantity.

Equivalent Ratios - Ratios that have the same value.

Associated Ratios (e.g., if a popular shade of purple is made by mixing 2 cups of blue paint for every 3 cups of red paint, not only can we say that the ratio of blue paint to red paint in the mixture is 2:3, but we can discuss associated ratios such as the ratio of cups of red paint to cups of blue paint, the ratio of cups of blue paint to total cups of purple paint, the ratio of cups of red paint to total cups of purple paint, etc.)

Ratio Table A table listing pairs of numbers that form equivalent ratios.

Focus Area Topic A:

*Representing and Reasoning About Ratios
Using Tables*

The Term Ratio

Students develop an understanding and definition of the term ratio. A ratio is always a pair of numbers like 2:3, and never a pair of quantities like 2 cm:3 sec. They write the ratio in two forms: 2:3 or 2 to 3. They understand that order matters. If I am comparing 2 cm to 3 sec. then I read and write the ratio 2:3 or 2 to 3. If I am comparing 3 sec to 3 cm I write the ratio 3:2 or 3 to 2.

Example Problem and Solution

A recipe for fruit salad requires 2 oranges for every 3 apples. Write this situation as a ratio of oranges to apples.

Answer: The ratio of oranges to apples is 2:3.

Students are encouraged to complete a table to show the relationship.

# of oranges	# of apples	Total # of Fruits
2	3	5

Students expand the table to show that there are other options to demonstrate 2 oranges for every 3 apples in the recipe.

# of oranges	# of apples	Total # of Fruits
2	3	5
4	6	10
6	9	15

Students are guided to articulate that there are $\frac{3}{2}$ as many apples as there are oranges. Another way to articulate the same situation is there are $\frac{2}{3}$ as many apples as there are oranges.



Focus Area Topic A:

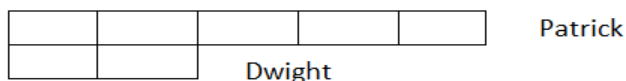
Representing and Reasoning About Ratios



Students develop an intuitive understanding of equivalent ratios by using tape diagrams to explore possible quantities when one of the quantities is given.

Example Problem and Solution

Patrick and Dwight are keeping track of the number of grams of sugar they consume each day as part of their diet regimen.



The ratio of the number grams of sugar Patrick consumes to the number of grams of sugar Dwight consumes in a day is 5 to 2. If together they consume 105 grams of sugar per day, how many grams do each of them consume? The tape diagram models the situation.

To determine how many grams of sugar each of them consumes, students need to know how many grams of sugar each of the sections of the tape diagram represents. Students divide the number of total grams of sugar they consume together (105 grams) by 7 total sections of the tape diagram.

105 divided by 7=15; therefore, each section of the tape diagram represents 15 grams of sugar. Patrick consumes 75 grams of sugar per day (15 x 5) and Dwight consumes 30 grams of sugar per day (15 x 2).

Value of a Ratio

The ratios of 5:2 and 75:30 are not the same ratios but we say they have the same value. The value of 75:30 is 5:2.

In our first example 2:3 and 6:9 are not the same ratio but we say the ratios have the same value.

Students begin to apply basic understanding of the relationship between ratio and fractions. We say if there are 2 boys to every 5 girls then the fractional relationship is there are $\frac{2}{5}$ as many boys as girls.

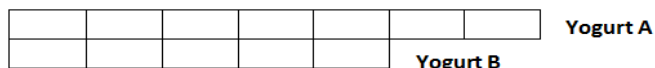


Focus Area Topic A:

Representing and Reasoning About Ratios

Example Problem and Solution

Shane is comparing two brands of Greek yogurt to determine which brand he should buy to sell in his store. When he surveyed his customers he determined the ratio of customers who preferred Yogurt A to the customers who preferred Yogurt B is 7 to 5. This relationship is modeled in the tape diagram.



What fraction of the total number of customers prefer Yogurt A to the number of customers who prefer Yogurt B?

The fraction of the total number of customers who prefer Yogurt A is $\frac{7}{5}$ of the total number of customers who prefer Yogurt B.

Students complete Topic A by solidifying the theorem that if two ratios are equivalent, then they have the same value.

Example Problem and Solution

Drew Brees was at a practice session for the Pro-Bowl. He threw 40 passes but only completed 25. Describe and write more than one ratio related to this situation.

The ratio of the number of passes thrown to the number of passes completed is 40:25

The ratio of the number of passes completed to the number of passes thrown is 25:40.

For each ratio you created, use the value of the ratio to express one quantity as a fraction of the other quantity.

The number of passes thrown is $\frac{40}{25}$ or $\frac{8}{5}$ of the number of completed passes.

The number of passes completed is $\frac{25}{40}$ or $\frac{5}{8}$ of the number of passes thrown.

Make up a word problem that a student can solve using one of the ratios you created in the previous example.

If Drew estimates he will throw 32 passes during the Pro-Bowl game, how many passes can he expect to complete, assuming his ratio of completed passes to passes thrown stays the same.

Answer: He can expect to complete 20 passes.