Unit Map 2012-2013

Monroe #2 - Orleans BOCES (Regional Collaboration)

Collaboration / Math 6* / Grade 6 (Math Regional Curriculum)

Wednesday, October 31, 2012, 12:06PM

Standard/Module: Proficiency with Ratios and Proportions 6.RP.3 (Week 17, 8 Weeks)

Stage 1: Desired Results

Standards Focus

- Major (70%) Links to 6.RP.1, 6.NS.2, 6.EE.9

6 Grade CCS Map.pdf

Standards

NYS: CCLS:Mathematics, NYS: 6th Grade , Ratios & Proportional Relationships

6.RP Understand ratio concepts and use ratio reasoning to solve problems.

- 3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- 3a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
- 3b. Solve unit rate problems including those involving unit pricing and constant speed.
- 3c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
- 3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Enduring Understandings	Essential Questions
1. Using ratios and proportions we can solve real-world and mathematical problems.	1. What are some real world applications of unit rate?
2. Tools such as tables, tape diagrams, and graphing on coordinate planes support the development of ratio and proportion reasoning.	2. How are equivalent ratios similar and different to equivalent fractions?
3. From a table you can plot points on a coordinate plane.	3. How can you use various tools to display and help understand sets of ratios?
4. Based on the table patterns, you can make predictions to continue plotting points on a coordinate plane.	4. How do you know if ratios truly produce a proportion or not (cross products)?
5. Percent is a rate per 100.	5. Can ratio reasoning be used for any form of conversions? Proof?
6. Percentage based problems compare two units where one of the units is based on 100.	6. Why if you get one problem wrong out of 10 does not equal 99%?
7. You can apply proportional reasoning for any conversion.	
8. Rate is the comparison of two quantities	

9. Unit rate is the comparison of two rates with one quantity of 1.	

Critical Content

1. Ratio

2. Rates

3. Proportions

4. Unit Rate

5. Equivalent ratios

6. Tape diagrams

7. Double number line diagrams

8. Equations

9. Graphing on a coordinate plane

10. Unit Pricing

11. Constant speed

12. Measurement units

13. Multiplying and diving quantities

14. Percent (part/whole = %/100)

15. Conversions

16. Multiplication and division

17. Means and extremes (Cross products)

18. Decimals

Skills	**Vocabulary**
1. Use ratios and rate reasoning to solve real- world and mathematical problems. 2. Apply reasoning to tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. 3. Make tables of equivalent ratios relating quantities with	1. Ratio 2. Rates 3. Proportions

whole-number measurements. 4. Find missing values in a table 5. Plot the x and y values on the coordinate plane 6. Use tales to compare ratios. 7. Solve unit rate problems including unit price and constant speed 8. Find a percent of a quantity as a rate per 100. 9. Find the part or the whole when given a percent. 10. Use ratios and proportions to convert measurement units. 11. Manipulate and transform units appropriately when multiplying and dividing quantities. 12. Fluency in multiply and dividing rational numbers. 14. Fluency in multiplying and dividing decimals.	4. Unit Rate 5. Equivalent ratios 6. Tape diagrams 7. Double number line diagrams 8. Equations 9. Graphing on a coordinate plane 10. Unit Pricing 11. Constant speed 12. Measurement units 13. Multiplying and diving quantities 14. Percent (part/whole = %/100) 15. Conversions 16. Multiplication and division 17. Means and extremes (Cross products) 18. Decimals

Stage 2: Assessment Evidence

Assessments

Skill-Based Taask
Formative: Performance: Skill Demonstration

There are four dogs and three cats. What is the ratio of dogs to cats and cats to dogs?

Problem Task
Formative: Performance: Skill Demonstration

The newspaper reported, "For every vote candidate A received, candidate B received three votes." Describe possible election results using at least three different ratios. Explain your answer.

Formative: Performance: Skill Demonstration

A credit card company charges 17% interest on any charges not paid at the end of the month. Make a ratio table to show how much the interest would be for several amounts. If your bill totals $450 for this month, how much interest would you have to pay if you let the balance carry to the next month? Show the relationship on a graph and use the graph to predict the interest charges for a $300 balance.

Stage 3: Learning Plan

Learning Activities	Resources
Recipe Re-Write Each ingredient in a recipe is added in a certain ratio to the other ingredients. You can write the relationship of two ingredients as a ratio: 2 eggs to 1 cup of flour, for example. Below is a recipe for quesadillas that serves 6 people. Work with your student to find the answers to the questions. Recipe: Quesadillas 2 cups shredded Colby cheese 6 flour tortillas 1 small tomato 1/4 cup chopped green onions 1/8 cup chopped green chilis Spread 1/3 cups of cheese on each tortilla. Mix the other ingredients. Spread over the tortillas. Fold, and bake at 350° for 5 minutes. Serves 6. Questions: a.) How many tomatoes would you need to make enough quesadillas for 24 people? b.) How many cups of chilis would you need to serve 18 people? c.) How many cups of cheese would you need to serve 15	http://engageny.org/common-core/ http://illustrativemathematics.org/ www.livebinders.com/play/play/52180 http://illuminations.nctm.org/ http://www.mathsisfun.com/geometry/polyhedron.html http://www.korthalsaltes.com/ http://www.softschools.com/math/ratios/rati

people? Find another recipe your students might enjoy making. Ask questions similar to the ones above to reinforce your students understanding of ratios and proportions. Percents are often taught in relationship to learning fractions and decimals. This cluster indicates that percents are to be taught as a special type of rate. Provide students with opportunities to find percents in the same ways they would solve rates and proportions. Part-to-part ratios are used to compare two parts. For example, the number of girls in the class (12) compared to the number of boys in the class (16) is the ratio the ratio 12 to 16. This form of ratios is often used to compare the event that can happen to the event that cannot happen. Rates, a relationship between two units of measure, can be written as ratios, such as miles per hour, ounces per gallon and students per bus. For example, 3 cans of pudding cost $2.48 at Store A and 6 cans of the same pudding costs $4.50 at Store B. Which store has the better buy on these cans of pudding? Various strategies could be used to solve this problem: • A student can determine the unit cost of 1 can of pudding at each store and compare. • A student can determine the cost of 6 cans of pudding at Store A by doubling $2.48. • A student can determine the cost of 3 cans of pudding at Store B by taking 1/2 of $4.50. Using ratio tables develops the concept of proportion. By comparing equivalent ratios, the concept of proportional thinking is developed and many problems can be easily solved. Students should also solve real-life problems involving measurement units that need to be converted. Representing these measurement conversions with models such as ratio tables, t-charts or double number line diagrams will help students internalize the size relationships between same system measurements and relate the process of converting to the solution of a ratio. Continued next page Store B 6 cans 3 cans $4.50 $2.50 Store A 3 cans 6 cans $2.48 $4.96 6Multiplicative reasoning is used when finding the missing element in a proportion. For example, use 2 cups of syrup to 5 cups of water to make fruit punch. If 6 cups of syrup are used to make punch, how many cups of water are needed? 2/5= 6/xRecognize that the relationship between 2	o_colorin g_game/

and 6 is 3 times; 2 · 3 = 6
To find x, the relationship between 5 and x must also be 3 times. 3 · 5 = x,
therefore, x = 15 2/5 = 6/15The final proportion.
Other ways to illustrate ratios that will help students see the relationships that follow. Begin written representation of ratios with the words "out of" or "to" before using the symbolic notation of the colon and then the fraction bar; for example, 3 out of 7, 3 to 5, 6:7 and then 4/5. Use skip counting as a technique to determine if ratios are equal. Labeling units helps students organize the quantities when writing proportions.
Using hue/color intensity is a visual way to examine ratios of part-to-part. Students can compare the intensity of the color green and relate that to the ratio of colors used. For example, have students mix green paint into white paint in the following ratios: 1 part green to 5 parts white, 2 parts green to 3 parts white, and 3 parts green to 7 parts white. Compare the green color intensity with their ratios.

Using a variety of situations, describe relationships using ratio, for example:
1. Part to part:Comparethenumberofgirlstoboysinthe classroom using the different symbols for ratio (girls: boys, girls to boys, , girls out of boys). Then compare the number of boys to girls in the same way.
2. Part to whole:Comparethenumberofgirlstothewhole class. Do the same thing for the boys in the class.

Differentiation Opportunities

Concentrating on Units of Measure
Use the list below to make up playing cards from index cards. Write one of these measures on each card, leaving the other side of the card blank. Place the cards in a rectangular array, face down. Later, you can help your child make up other pairs of cards for the next game. Take turns turning over 2 cards at a time. If the cards show equivalent measures (for instance 12 inches and 1 foot), the player gets to keep the cards. If the measures are not equivalent, the cards are turned face down in their place. When all the cards are taken, the player with the most cards wins.

3 ft
36 in.
5,280 ft
1,760 yd
2 gal
8 pt
15 yd
45 ft
3 pt
24 fl oz
32 oz
2 lbs
6,000 mL

6L
2,000 cm
20 m
500 mL
0.5 L
4,000 m
4 km
7,000 g
7 kg
24 oz
1.5 lbs
7 yd
21 ft
72 in.
2 yd
3L
3,000 mL

This is the students' first introduction to percents. Percentages are a rate per 100. Models, such as percent

bars or 10 x 10 grids should be used to model percents. Students use percentages to find the part when given the percent, by recognizing that the whole is being divided into 100 parts and then taking a part of them (the percent). For example, to find 40% of 30, students could use a 10 x 10 grid to represent the whole (or 30). If the 30 is divided into 100 parts, the rate for one block is 0.3. Forty percent would be 40 of the blocks, or 40 x 0.3, which equals 12.

<< Previous Year

Last Updated: Sunday, October 7, 2012, 9:32AM

Atlas Version 7.2.6
© Rubicon International 2012. All rights reserved