Unit 2b-Ratios and Proportional Reasoning

Content Area: **Math**
Course(s): **Math 6 Honors**
Time Period: **Marking Period 2**
Length: **Weeks 7-9 MP2 and Weeks 1-5 MP3 Into Math Advanced 1 Unit 3**
Status: **Published**

Essential Questions

1. How can you use ratios and rates to solve real world problems?
2. How can you use percentages to solve real world problems?

Big Ideas

- Understand ratio concepts and use ratio reasoning to solve problems.
- Apply and extend previous understandings of numbers to the system of rational numbers.
- Analyze proportional relationships and use them to solve real-world and mathematical problems (Percent).

Cross-Curricular Integration

Integration Area: Language Arts

LA.W.WP.6.4 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, flexibly making revising, editing, rewriting, or trying a new approach and revision choices; sustaining effort to fit composition needs and purposes; and attempting to address purpose and audience. .

LA.W.WR.6.5 Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

LA.W.SE.6.6 Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. Students may assess the credibility of evidence and sources while constructing an argument related to how changes to physical or biological components of an ecosystem affect populations.

Activity:

The students will use online and print resources to research a career that uses math on a daily basis. They will use the writing process to write two informative/explanatory essays that discuss how the career integrates mathematics and how the career benefits society. The students will represent their career in three forms: Presentation, poster display, and Google Slides. They

will upload their Slides onto their Google Classroom site. The students will be given an opportunity to dress up as their profession during their presentation.

CSDT Technology Integration

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.NI.3: Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems.

Activity:

1) Khan Academy could be used as reinforcement or a flipped classroom method. For ratios and proportions students are learning the material and strategies. Khan academy allows students to work at their own pace through the video and pause and rewind to make sure they understand. They are also given practice problems to check for understanding, for each topic under the Proportional Relations chapter. As students take the quizzes they are either advised to advance or rewatch the lesson. After all lessons are watched/reviewed, there is a unit test for students to take. Student's scores can be tracked through the class account and it drives instruction based on which topic students are struggling with.

2)Google Slides Presentation on a restaurant project. Students research other restaurants and deals to create a menu with realistic pricing. Students create scenarios of people visiting their restaurant including tax, using coupons or receiving a discount. In their scenarios, students also calculate the tip, subtotals, discounted price, discount, and final total the guests will pay.

Enduring Understandings

Ratios and Proportional Relationships

6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2

wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."

6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."

6.RP.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.

6.RP.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.

6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

6.RP.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.

6.RP.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Ratios and Proportional Relationships

7.RP.A1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

7.RP.A2 Recognize and represent proportional relationships between quantities.

7.RP.A.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.A.2c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.

7.RP.A.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Lesson 9.2, 11.4, 12.3, 13.3

2. Reason abstractly and quantitatively. Lesson 9.1, 9.2, 10.2, 10.3, 11.1, 11.2, 11.3, 11.4, 13.1, 13.2, 13.3, 13.4

3. Construct viable arguments and critique the reasoning of others. Lesson 9.2

4. Model with mathematics. Lesson 9.5, 10.1, 10.2, 11.2, 11.3, 11.4,12.1, 12.2, 13.2, 13.3, 13.4

5. Use appropriate tools strategically. Lesson 10.1, 10.3, 12.1, 12.3,

6. Attend to precision. Lesson 9.1, 9.2, 9.3, 9.4, 10.3, 12.1, 12.2, 13.4, 13.5

7. Look for and make use of structure. Lesson 9.3, 9.4, 9.5, 11.1, 11.2, 11.3, 12.2, 12.3, 13.1, 13.3, 13.5

8. Look for and express regularity in repeated reasoning. Lesson 9.5