Unit 2: Ratios and Proportional Relationships

Content Area: **Mathematics**
Course(s): **Math - Grade 6**
Time Period: **2nd Marking Period**
Length: **8 weeks**
Status: **Published**

Unit Overview

In this unit students will be able to

- explore ratio concepts and use ratio reasoning to solve rate problems (Chapter 4)
- apply the relationships of frasctions, decimals and percents to solve percent problems (Chapter 5)

Transfer

Students will be able to independently use their learning to solve real world situations such as:.

- calculating miles per gallon, mile per hour etc.
- calculating unit conversions.
- finding parts to whole/ parts to part.
- finding unit pricing.
- finding the best deal.
- finding LCM and GCF of three or more numbers.
- converting fluently between fractions, decimals, and percents.

Meaning

Understandings

Students will understand:

- how to use tables and graphs to find and solve for equivalent rates, including unit rates.
- when to use a fraction, a decimal, or a percent.

Essential Questions

How can you use mathematics to describe change and model real-world situations? *(Unit 2)*

- How do you use equivalent rates in real-world situations? *(Chapter 4)*
- When is it better to use a fraction, a decimal, or a percent? *(Chapter 5)*

Application of Knowledge and Skill

Students will know...

Students will know:

- the vocbulary accompanying the unit.
- multiple ways to represent ratios and rates.
- the procedure for converting between fractions, decimals, and percents.

Students will be skilled at...

Students will be skilled at:

- writing ratios and proportions
- solving for equivalent ratios and rates.
- comparing and ordering ratios and rates.
- solving for unit rates.
- solving real world problems dealing with ratios, rates, and proportions, including percents.
- ex) 40% of the students in a class like apples for breakfast. If 20 students like apples, how many students are in the class?
- converting between equivalent fractions, decimals, and percents.
- comparing and ordering fractions, decimals, and percents.
- finding the percent of a number.
- finding the whole when given the part and the percent.

Academic Vocabulary

Chapter 4 - Ratios

Coordinate Plane, Equivalent Ratio, Graph, Greatest Common Factor (GCF), Least Common Multiple (LCM) Ordered Pair, Origin, Prime Factorization, Rate, Ratio, Ratio Table, Scaling, Unit Price, Unit Rate, x-axis, x-coordinate, y-axis, y-coordinate

Chapter 5 - Rates and Percentages

Least Common Denominator, Percent, Percent Proportion, Proportion, Rational Number

Learning Goal - Chapter 1 - Ratios and Rates

SWBAT

- use equivalent rates in the real world.

Daily Targets- Chapter 4- Ratios

SWBAT:

- **Lesson 1**: understand the concept of a ratio. (DOK 2)
- **Lesson 2:** use ratio language to describe ratio relationship between two or more quantities. (DOK 2)
- **Lesson 3:** use ratio reasoning to solve real-world problems including measurement conversions. (DOK 3)
- **Lesson 4:** use ratio reasoning to solve real-world problems. (DOK 3)
- **Lesson 5**: solve equivalent ratio problems using tables. (DOK 2)
- **Lesson 6:** solve problems of equivalent ratios while constructing tables. (DOK 3)
- **Lesson 7:** compare ratios using tables. (DOK 3)
- **Lesson 8**: solve problems involving finding the whole when given the part and a ratio. (DOK 3)
- **Lesson 9:** construct tape diagrams to solve ratio problems. (DOK 3)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.

MA.6.RP.A.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.
MA.6.RP.A.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.
MA.6.RP.A.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.6.RP.A.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.
MA.6.RP.A.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
MA.K-12.8	Look for and express regularity in repeated reasoning.

Learning Goal - Chapter 5 - Rates and Percentage

SWBAT:

- moving from ratio to unit rate
- understanding percentages as a rate out of 100.

Daily Targets- Chapter 5- Rates and Percentage

SWBAT:

- **Lesson 1**: understand how rates relate to ratios. (DOK 1)
- **Lesson 2:** understand the concept of a unit rate. (DOK 1)
- **Lesson 3:** solve unit pricing problems. (DOK 2)
- **Lesson 4:** solve problems about constant speed. (DOK 2)
- **Lesson 5:** use ratio reasoning to convert measurement unit. (DOK 2)
- **Lesson 6:** understand that a percent is a rate per 100. (DOK 2)
- **Lesson 7:** use tape diagrams to reason about percents. (DOK 2)
- **Lesson 7**: convert a percent to a fraction and decimal. (DOK 2)
- **Lesson 8:** use double number line to reason about percentages. (DOK 2)
- **Lesson 9:** find the part given a percent and the whole. (DOK 2)
- **Lesson 10**: find the total amount using a percent and part of the total. (DOK 2)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.6.RP.A.2	Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.6.RP.A.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.
MA.K-12.5	Use appropriate tools strategically.

MA.6.RP.A.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.6.RP.A.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.
MA.6.RP.A.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Summative Assessment

Adaptive Practice

Group Presentation

Unit Test

Unit Project

21st Century Life and Careers and Technology

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP5.1	Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.

CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.8.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.8.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.8.D.CS2	Demonstrate personal responsibility for lifelong learning.
TECH.8.1.8.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.8.E.CS4	Process data and report results.

Formative Assessment and Performance Opportunities

- Academic Game
- BrainPop
- Centers
- Class Discussions
- Clickers
- Do Now
- Exit Ticket
- Graphic Organizer
- Project
- Quiz
- Self-Assessment
- Student Teacher
- Teacher Interview
- Teacher Observation
- Think, Pair, Share

Differentiation / Enrichment

- Teacher provides notes for the students.
- Teacher will modify test for students.

- A word bank can be provided for any vocabulary quiz.
- Leveled centers can be used.
- Small group instruction can be utilized.
- Manipulatives and pictures can be used to represent ratios.
- Real-world situations about ratios and rates can be demonstrated in the classroom.
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Unit Resources

CK-12 www.ck12.org