Unit 02: Ratios, Rates, Percents & Proportional Reasoning

Content Area: **TEMPLATE**
Course(s):
Time Period: **Full Year**
Length: **6 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students will develop skills in using fractions, decimals, ratios and percents to measure and to compare quantities.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Essential Questions:

- How do you recognize and represent proportional relationships between quantities?
- What does it mean for two ratios or fractions to be equivalent?
- In what way is a percent like a ratio and like a fraction?

Enduring Understandings:

- Proportional reasoning allows measured quantities to be compared through multiplication and division.
- A comparison of quantities can be expressed in a variety of different but useful ways.
- Given comparison data can be used to make predictions about unknown quantities.

CONTENT AREA STANDARDS

MA.6.RP.A	Understand ratio concepts and use ratio reasoning to solve problems.
MA.6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
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.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-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

CS.K-12.3	Recognizing and Defining Computational Problems
CS.K-12.5	Creating Computational Artifacts
LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
LA.K-12.NJSLSA.SL4	Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
WRK.K-12.P.2	Attend to financial well-being.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand:

- The concept of a ratio.
- The concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$.
- A percent of a quantity as a rate per 100.

Procedural Knowledge

Students will be able to:

- Use ratio language to describe a relationship between two quantities.
- Use rate language in the context of a ratio relationship.
- Use ratio reasoning to convert measurement units.
- Make tables of equivalent ratios relating quantities with whole number measurements.
- Plot pairs of values from tables of equivalent ratios on the coordinate plane.
- Solve unit rate problems including those involving unit pricing and constant speed.
- Solve problems involving finding the whole, given a part and the percent.

EVIDENCE OF LEARNING

Formative Assessments

- Observations/Checklists
- Classwork
- Do Now Questions/Exit Tickets
- Self Assessment Questions
- Journal: Explain at least two methods for comparing fractions, decimals, and percents.
- Illustrative Math Performance Tasks:
  - 6.RP.A.1 Games at Recess
  - 6.RP.A.2 Price per pound and Pounds per dollar
  - 6.RP.A.3 Constant Speed
- IXL Skills Practice
- Student Proficiency Scale

Summative Assessments

- Portfolio Artifacts

Averages are based upon participation/preparation, classwork, and quizzes. Student marking period grades are either O (outstanding), S (satisfactory), or U (unsatisfactory).

RESOURCES (Instructional, Supplemental, Intervention Materials)

- *CMP3 Comparing Bits & Pieces*
- *CMP3 Decimals Ops (Investigation 4 Only)*
- *enVision Math 2.0 Grade 6*

- [Savvas Realize](#) (teacher and student resources)
- [Khan Academy](#)
- [IXL](#)- Skills included under the follow domains:
    - R. Ratios & Rates
    - S. Percents
    - V. Consumer Math
- [Desmos](#): Balloon Float Activity
- *[MathXL for School](#)*
- [Illustrative Mathematics Performance Tasks](#)
- [NCTM Illuminations](#)
- Quiz Review Sheets (see classroom teacher)

INTERDISCIPLINARY CONNECTIONS

- Computations
- Financial/Economic/Business/Entrepenerial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.