Unit 1 - Ratios and Proportional Relationships

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

Analyze proportional relationships and use them to solve real-world and mathematical problems. Modules 1 & 2.

Enduring Understandings

Ratios of fractions can be computed to find unit rates.

Two quantities can be tested for a proportional relationship in a table or by graphing on a coordinate plane and observing whether the graph is a straight line through the origin

The constant of proportionality is the unit rate.

Equations can be made to represent proportional relationships.

Proportional relationships are the solution to simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error problems.

Essential Questions

How do you know if a relationship is proportional?

How can we use mathematical models to describe physical relationships?

What does it mean for two quantities to be in a proportional relationship?
How can you find a unit rate in which one or both quantities are fractions?
How can organizing information in a table help you determine if the ratios between two quantities are equivalent?
How are the graphs of proportional and nonproportional linear relationships alike? How are they different?
How are equations of proportional relationships different from those of nonproportional relationships?

Learning Objectives

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

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.)

Recognize and represent proportional relationships between quantities. (Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Additionally, 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.

Use proportional relationships to solve multistep ratio and percent problems.

Analyze interest rates and fees associated with financial services, credit cards, debit cards, gift cards, tax, percent increase, and percent decrease.

Standards: Content

7.RP	Ratios and Proportional Relationships
7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
7.RP.A.2	Recognize and represent proportional relationships between quantities.
7.RP.A.2.a	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.2.b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.A.2.c	Represent proportional relationships by equations.
7.RP.A.2.d	Explain what a point (□, □) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, □) where □ is the unit rate.
7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.

Standards: Interdisciplinary

9.1.8.CDM.4	Evaluate the application process for different types of loans (e.g., credit card, mortgage, student loans).
9.1.8.CP.1	Compare prices for the same goods or services.
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.1.8.DA.4	Transform data to remove errors and improve the accuracy of the data for analysis.
8.1.8.DA.5	Test, analyze, and refine computational models.
8.1.8.AP.1	Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
8.1.8.AP.2	Create clearly named variables that represent different data types and perform operations

on their values.

Assessment Evidence

Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips, Pre-Assessments
Summative	LinkIt Benchmark Assessments, Tests, Pre-Assessments, Quizzes, Written Responses
Alternative & Benchmark	Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Benchmark - LinkIt Benchmark Assessments, Totowa TPA
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, iPads, websites and digital interactives/models, multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Assorted Manipulatives, Khan Academy, Crosswalk Coach for the Common Core Standards, Ready Common Core Mathematics Instruction and Practice, Common Core Coach, Calculators, Reveal Math Resources.

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness	X	Relationship Skills
X	Responsible Decision-Making		Social Awareness
X	Self-Management		

21st Century Skills & Themes

	Global and Cultural Awareness	X	Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
X	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		