Unit 3: Ratios and Proportional Reasoning

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

UNIT RATIONALE

This unit is designed to support students in ratios and proportional reasoning. Students will understand the concepts of a ratio and use ratio language to describe a ratio relationship between two quantities. Students will use tables to record ratios and to find missing quantities in ratios by comparing them to equivalent ratios. Students learn to find and use unit rates to solve problems. Students will solve real-world and mathematical problems involving ratios not given as unit rates and proportions that do not include unit rates. Students apply their understanding of ratios to interpret and construct circle graphs. Students will use ratio reasoning to convert measurement units. Students will examine relationships between two quantities described in words, with a table, or with a diagram. Students will examine tables of data to see if they show a proportional relationship. Students examine tables of data and graph them to see if all the points lie on a straight line and whether that line passes through the origin. Students will use proportions to convert between different unit rates, such as miles per hour or feet per second. Students will recognize that ratios, fractions, and percents are equivalent representations of the same mathematical relationship. Finally students will use proportional relationships to solve multi-step ratio and percent problems.

ESSENTIAL QUESTIONS

How do mathematicians understand and write ratios?

How do mathematicians use tables and graphs to represent ratios and rates?

How do mathematicians use a table to compare ratios and rates?

How do mathematicians find and use unit rates to solve problems?

How do mathematicians identify and generate equivalent expressions?

How do mathematicians use equivalent ratios to solve real-world problems?

How do mathematicians apply ratio reasoning to make and interpret circle graphs?

How do mathematicians convert units within a measurement system?

How do mathematicians use equivalent ratios to convert measurements between measurement systems?

How do mathematicians use patterns and unit rates to analyze and describe relationships?

How do mathematicians determine if a relationship represented in a table is proportional, identify the constant of proportionality, and write an equation in the form of y = kx?

How do mathematicians identify the characteristics of a proportional relationship when graphed?

How do mathematicians use a proportional relationship to solve multi-step problems?

How do mathematicians write a ratio as a percent?

How do mathematicians find a percent of a quantity?

How do mathematicians use percents to solve real-world problems?

How do mathematicians use proportional reasoning to calculate percent increase or decrease?

How do mathematicians calculate markups, markdowns, retail prices, and discount prices, and represent them

using equations of the form y = kx?

How do mathematicians represent taxes, gratuities, and total cost using equations in the form y = kx by applying proportional reasoning. Use the equations to solve problems and assess reasonableness of answers?

How do mathematicians use proportional reasoning to find total earnings for someone earning a base salary plus a commission? Use proportional reasoning to find fees (including fees as percent and as a constant) and assess the reasonableness of answers?

How do mathematicians use proportional reasoning to calculate simple interest and the total value of an account earning simple interest, and assess the reasonableness of answers?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

MA.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.
MA.6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
MA.7.RP.A.2	Recognize and represent proportional relationships between 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.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.
MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.7.RP.A.2c	Represent proportional relationships by equations.
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.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.
MA.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.
MA.6.RP.A.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
MA.6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent

	the problem.
MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.B.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
MA.7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
MA.7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
MA.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
MA.6.NS.C.6c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
MA.6.NS.C.7b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.
MA.6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
MA.7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
MA.6.NS.C.7d	Distinguish comparisons of absolute value from statements about order.
MATH.6.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
MATH.6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

PFL.9.1.8.CR.2	Compare various ways to give back through strengths, passions, goals, and other personal

	factors.
PFL.9.1.8.CP.1	Compare prices for the same goods or services.
TECH.9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
	An individual's strengths, lifestyle goals, choices, and interests affect employment and income.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.6-8.2-AP-10	Use flowcharts and/or pseudocode to address complex problems as algorithms.

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

	Analyzing and Interpreting Data
SOC.5-8.1.1.1	Construct timelines of the events occurring during major eras including comparative events in world history for the different civilizations.

PRE-ASSESSMENTS

Module 9: Ratios and Proportional Reasoning "Are You Ready?" pg 322

Module 10: Apply Ratio and Rates to Measurement "Are You Ready?" pg 362

Module 11: Identify and Represent Proportional Relationships "Are You Ready?" pg 388

Module 12: Understand and Apply Percent "Are You Ready?" pg 422

Module 13: Proportional Reasoning with Percents "Are You Ready?" pg 446

INSTRUCTIONAL PLAN

MODULE 9

Module 9: Ratios and Proportional Reasoning

LESSON 9.1

Student Learning Intentions (SLI) WALT: (We are learning to…)	9.1 We are learning to understand and write ratios.
Student Learning Strategies	Calculate Birds per Birdhouse Use a Model
Success Criteria	I can find and express ratios.
Formative Assessment (drives instructional decisions)	Turn and Talk Questions (p. 323, 324) Check for Understanding (p. 325)
Activities and Resources	**Warm-up:** Activate Prior Knowledge (TM p. 323B) & Spark Your Learning (p. 323) **Mini-lesson:** Build Understanding (p. 323-325) **Guided Practice:** Check Understanding (p. 325) **Independent Practice:** On Your Own (p. 326) & Exit Ticket (TM p. 326) Teacher Resources: Into Math Teacher Edition Module 9 Online Resources
Suggested Modifications	Plan for Differentiated Instruction (TM p. 323C)

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.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.B.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

LESSON 9.2

Student Learning Intentions (SLI) WALT: (We are learning to…)	9.2 We are learning to learn to use tables and graphs to represent ratios and rates.
Student Learning Strategies	Use Multiplication to Complete a Table Use Additive Reasoning to Complete a Table

Success Criteria	I can use tables and graphs to represent ratios and rates, and I can find equivalent ratios and unit rates.
Formative Assessment (drives instructional decisions)	Turn and Talk Questions (p. 329, 331, 332) Check for Understanding (p. 332)
Activities and Resources	**Warm-up:** Activate Prior Knowledge (TM p. 329B) & Spark Your Learning (p. 329) **Mini-lesson:** Build Understanding (p. 329-331) **Guided Practice:** Check Understanding (p. 331) **Independent Practice:** On Your Own (p. 333-334) & Exit Ticket (TM p. 334) Teacher Resources: Into Math Teacher Edition Module 9 Online Resources
Suggested Modifications	Plan for Differentiated Instruction (TM p. 329C)

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.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.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

LESSON 9.3

Student Learning Intentions (SLI) WALT: (We are learning to…)	9.3 We are learning to use a table to compare ratios and rates.
Student Learning Strategies	Use fractions. Estimate.
Success Criteria	I can analyze tables to compare ratios and rates.
Formative Assessment (drives instructional decisions)	Turn and Talk Questions (p. 337) Check for Understanding (p. 338)
Activities and Resources	**Warm-up:** Activate Prior Knowledge (TM p. 337B) & Spark Your Learning (p. 337)

	Mini-lesson: Build Understanding (p. 337-338) **Guided Practice**: Check Understanding (p. 339) **Independent Practice**: On Your Own (p. 339) & Exit Ticket (TM p. 340) Teacher Resources: Into Math Teacher Edition Module 9 Online Resources
Suggested Modifications	Plan for Differentiated Instruction (TM p. 337C)

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.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
MA.6.NS.C.7d	Distinguish comparisons of absolute value from statements about order.

LESSON 9.4

Student Learning Intentions (SLI) WALT: (We are learning to...)	9.4 We are learning to find and use unit rates to solve problems.
Student Learning Strategies	Use Fractions Use Estimation
Success Criteria	I can find and use unit rates.
Formative Assessment (drives instructional decisions)	Turn and Talk Questions (p. 343, 344) Check for Understanding (p. 345)
Activities and Resources	**Warm-up:** Activate Prior Knowledge (TM p. 343B) & Spark Your Learning (p. 343) **Mini-lesson**: Build Understanding (p. 343-344) **Guided Practice**: Check Understanding (p. 219) **Independent Practice**: On Your Own (p. 346-348) & Exit Ticket (TM p. 348) Teacher Resources: Into Math Teacher Edition Module 9 Online Resources

Suggested Modifications	Plan for Differentiated Instruction (TM p. 343C)

MA.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.
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.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.
MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.6.RP.A.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

LESSON 9.5

Student Learning Intentions (SLI) WALT: (We are learning to…)	9.5 We are learning to use equivalent ratios to solve real-world problems.
Student Learning Strategies	Use Estimation. Use Fractions.
Success Criteria	I can use ratio reasoning to solve problems.
Formative Assessment (drives instructional decisions)	Turn and Talk Questions (p.351 & 352) Check for Understanding (p. 352)
Activities and Resources	**Warm-up:** Activate Prior Knowledge (TM p. 351B) & Spark Your Learning (p. 351) **Mini-lesson:** Build Understanding (p. 351-352) **Guided Practice:** Check Understanding (p. 352) **Independent Practice:** On Your Own (p. 354-356) & Exit Ticket (TM p. 356) Teacher Resources: Into Math Teacher Edition Module 9 Online Resources
Suggested Modifications	Plan for Differentiated Instruction (TM p. 351C)

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.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.B.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
MA.6.NS.C.6c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

MODULE 10

Module 10: APPLY RATIOS AND RATES TO MEASUREMENT

LESSON 10.1

Student Learning Intentions (SLI) WALT: **(We are learning to…)**	10.1 We are learning to apply ratio reasoning to make and interpret circle graphs.
Student Learning Strategies	Use Fraction Operations to Solve Problems Use Equivalent Fractions
Success Criteria	I can use reasoning about equivalent ratios to make and interpret a circle graph.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 363, pg 365) Check Understanding (pg 365) Exit Ticket (TM pg 366)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 363B) **Mini-Lesson**: Spark Your Learning (pg 363), Build Your Understanding (pg 364-365) **Guided Practice**: Check Understanding (pg 365)

	Independent Practice: On Your Own (pg 366) and Exit Ticket (TM pg 366) Teacher Resources Into Math Teacher Edition Module 10 & Online Resources
Suggested Modifications	Plan For Differentiated Instruction (TM pg 363C)

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.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

LESSON 10.2

Student Learning Intentions (SLI) WALT: (We are learning to…)	10.2 We are learning to convert units within a measurement system.
Student Learning Strategies	Change Mixed Numbers to Fractions and Multiply Use a Visual Model
Success Criteria	I can convert measurements within a measurement system by using equivalent ratios or conversion factors.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 369, pg 370) Check Understanding (pg 372) Exit Ticket (TM pg 374)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 369B) **Mini-Lesson**: Spark Your Learning (pg 369), Build Your Understanding (pg 370-372) **Guided Practice**: Check Understanding (pg 372) **Independent Practice**: On Your Own (pg 373) and Exit Ticket (TM pg 374) Teacher Resources Into Math Teacher Edition Module 10 & Online Resources

Suggested Modifications	Plan For Differentiated Instruction (TM pg 369C)

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.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.6.RP.A.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

LESSON 10.3

Student Learning Intentions (SLI) WALT: (We are learning to…)	10.3 We are learning to use equivalent ratios to convert measurements between measurement systems.
Student Learning Strategies	Convert the Mixed Number to a Fraction and Divide Use a Model
Success Criteria	I can convert measurements between measurement systems by using equivalent rates or conversion factors.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg377, 378, 379, 380) Check Understanding (pg 380) Exit Ticket (TM pg 382)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 377B) **Mini-Lesson**: Spark Your Learning (pg 377), Build Your Understanding (pg 378-380) **Guided Practice**: Check Understanding (pg 380) **Independent Practice**: On Your Own (pg 381) and Exit Ticket (TM pg 382) Teacher Resources Into Math Teacher Edition Module 10 & Online Resources
Suggested Modifications	Plan For Differentiated Instruction (TM pg 377C)

MA.6.RP.A.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.6.RP.A.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
MA.6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division

of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

MA.6.NS.B.3   Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

MODULE 11

Module 11 IDENTIFY AND REPRESENT PROPORTIONAL RELATIONSHIPS

LESSON 11.1

Student Learning Intentions (SLI) WALT: (We are learning to…)	11.1 We will learn to use patterns and unit rates to analyze and describe relationships.
Student Learning Strategies	Use Models to Relate Size of Parts Use Equivalent Ratios to Relate Size of Parts
Success Criteria	I can recognize when a relationship presented in a table, diagram, or verbal description can be represented by a constant unit rate.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 389. 390) Check Understanding (pg 391) Exit Ticket (TM pg 392)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 389) **Mini-Lesson**: Spark Your Learning (pg 389), Build Understanding (pg 390), Step it Out (pg 391) **Guided Practice**: Check Understanding (pg 269) **Independent Practice**: On Your Own (pg 391) and Exit Ticket (TM pg 392) Teacher Resources Into Math Teacher Edition Module 11 & Online Resources
Suggested Modifications	Plan for Differentiation (TM pg 389C)

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.7.RP.A.2	Recognize and represent proportional relationships between quantities.
MA.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.
MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.C.7c	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

LESSON 11.2

Student Learning Intentions (SLI) WALT: (We are learning to…)	11.2 We will learn to determine if a relationship represented in a table is proportional, identify the constant of proportionality, and write an equation in the form of y = kx
Student Learning Strategies	Use Equivalent Ratios Look for Patterns
Success Criteria	I can identify a proportional relationship, find its constar of proportionality, and write an equation to represent it.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 395, 396, 398) Check Understanding (pg 398) Exit Ticket (TM pg 400)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 395) **Mini-Lesson**: Spark Your Learning (pg 395), Build Understanding (pg 396), Step it Out (pg 397) **Guided Practice**: Check Understanding (pg 398) **Independent Practice**: On Your Own (pg 399) and Exit Ticket (TM pg 400) Teacher Resources Into Math Teacher Edition Module 11 & Online Resources
Suggested Modifications	Plan for Differentiation (TM pg 395C)

MA.6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (−1)(−1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
MA.7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
MA.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.

LESSON 11.3

Student Learning Intentions (SLI) WALT: (We are learning to…)	11.3 We will learn to identify the characteristics of a proportional relationship when graphed.
Student Learning Strategies	Analyze a Proportional Relationship Graph the Proportional Relationship
Success Criteria	I can identify a proportional relationship from a graph and use the graph to find the constant of proportionality and equation.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 403, 404) Check Understanding (pg406) Exit Ticket (TM pg 408)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 403) **Mini-Lesson**: Spark Your Learning (pg 267), Build Understanding (pg 404), Step it Out (pg 405) **Guided Practice**: Check Understanding (pg 406) **Independent Practice**: On Your Own (pg 407) and Exit Ticket (TM pg 4080) Teacher Resources Into Math Teacher Edition Module 11 & Online Resources
Suggested Modifications	Plan for Differentiation (TM pg 403C)

MA.6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
MA.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.
MA.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.
MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.7.RP.A.2c	Represent proportional relationships by equations.
MA.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.
MA.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

LESSON 11.4

Student Learning Intentions (SLI) WALT: (We are learning to…)	11.4 We will learn to Use a proportional relationship to solve multi-step problems.
Student Learning Strategies	Visual Model
Success Criteria	I can identify the constant of proportionality and write an equation for a proportional relationship presented in various forms and use them to solve multi-step ratio problems.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 411, 412, 413) Check Understanding (pg 414) Exit Ticket (TM pg 416)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 411) **Mini-Lesson**: Spark Your Learning (pg 267), Build Understanding (pg 268), Step it Out (pg 269) **Guided Practice**: Check Understanding (pg 414) **Independent Practice**: On Your Own (pg 415) and Exit Ticket (TM pg 416) Teacher Resources Into Math Teacher Edition Module 11 & Online Resources
Suggested Modifications	Plan for Differentiation (TM pg 411C)

MA.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.
MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams,

and verbal descriptions of proportional relationships.

| MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. |

MODULE 12
Module 12: UNDERSTAND AND APPLY PERCENT

LESSON 12.1

Student Learning Intentions (SLI) WALT: (We are learning to…)	12.1 We are learning to write a ratio as a percent.
Student Learning Strategies	Use 10x10 grid
Success Criteria	I can convert ratios to percents by applying one strategy and I can explain my method to others.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 295, 296, 297) Check Understanding (pg 298) Exit Ticket (TM pg 300)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 295B) **Mini-Lesson**: Spark Your Learning (pg 295) Build Understanding (pg 296) Step It Out (pg 297-298) **Guided Practice**: Check Understanding (pg 298) **Independent Practice**: On Your Own (pg 299 - 300) and Exit Ticket (TM pg 300)
Suggested Modifications	Plan For Differentiated Instruction (TM pg 295C)

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.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.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

LESSON 12.2

Student Learning Intentions (SLI) WALT: (We are learning to…)	12.2 We are learning to find a percent of a quantity.
Student Learning Strategies	Use an Equation with Equivalent Ratios Use Models to Find Equivalent Ratios
Success Criteria	I can use three different methods to write a ratio as a percent.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 423, 424, 425, 426) Check Understanding (pg 426) Exit Ticket (TM pg 428)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 423B) **Mini-Lesson**: Spark Your Learning (pg 423) Build Understanding (pg 424) Step It Out (pg 424-425) **Guided Practice**: Check Understanding (pg 426) **Independent Practice**: On Your Own (pg4270) and Exit Ticket (TM pg 428)
Suggested Modifications	Plan For Differentiated Instruction (TM pg 423)

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.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.6.NS.C.7b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.

LESSON 12.3

Student Learning Intentions (SLI) WALT: (We are learning to…)	12.3 We are learning to use percents to solve real-world problems.
Student Learning Strategies	Use an Equation with Equivalent Ratios Use Models to Find Equivalent Ratios
Success Criteria	I can solve real-world percent problems that require me to find the part, the percent, or the whole.

Formative Assessment (drives instructional decisions)	Turn and Talk (pg 439, 440) Check Understanding (pg 440) Exit Ticket (TM pg 442)
Activities and Resources	**Warm-Up**: Activate Prior Knowledge (TM pg 439B) **Mini-Lesson**: Spark Your Learning (pg 439) Build Understanding (pg 440) Step It Out (pg 441-442) **Guided Practice**: Check Understanding (pg 441) **Independent Practice**: On Your Own (pg442) and Exit Ticket (TM pg 442)
Suggested Modifications	Plan For Differentiated Instruction (TM pg 439C)

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.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

MODULE 13
Module 13 Decimal Place Value

LESSON 13.3

Student Learning Intentions (SLI) WALT: (We are learning to…)	13.3 We are learning to represent taxes, gratuities, and total cost using equations in the form y = kx by applying proportional reasoning. Use the equations to solve problems and assess reasonableness of answers.
Student Learning Strategies	Estimation Visual Model
Success Criteria	I can find taxes, gratuities, and total costs by writing and using equations of the form y = kx, and assess

	the reasonableness of results.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 461, 462) Check Understanding (pg 463) Exit Ticket (TM pg 464)
Activities and Resources	**Warm-up**: Activate Prior Knowledge (TM pg 461B) **Mini-Lesson**: Build Your Understanding (pg 462 & 463) **Guided Practice**: Check Understanding (pg 463) **Independent Practice**: On Your Own (pg 464)
Suggested Modifications	Plan for Differentiated Instruction (TM pg 461)

MA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MA.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.

LESSON 13.2

Student Learning Intentions (SLI) WALT: (We are learning to…)	13.2 We are learning to calculate markups, markdowns, retail prices, and discount prices, and represent them using equations of the form y = kx
Student Learning Strategies	Estimation Visual Model
Success Criteria	I can calculate markups, markdowns, and retail prices and write equations for markup and markdown situations.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 455, 456) Check Understanding (pg 457) Exit Ticket (TM pg 458)
Activities and Resources	**Warm-up**: Activate Prior Knowledge (TM pg 455B) **Mini-Lesson**: Build Your Understanding (pg 456 & 457) **Guided Practice**: Check Understanding (pg 457) **Independent Practice**: On Your Own (pg 458)
Suggested Modifications	Plan for Differentiated Instruction (TM pg 455)

MA.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.

MA.7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.
MA.7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
MA.7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

LESSON 13.1

Student Learning Intentions (SLI) WALT: (We are learning to…)	13.1 We are learning to use proportional reasoning to calculate percent increase or decrease
Student Learning Strategies	Estimation Visual Model
Success Criteria	I can solve multi-step problems involving percent change.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 449, 450) Check Understanding (pg 450) Exit Ticket (TM pg 452)
Activities and Resources	**Warm-up**: Activate Prior Knowledge (TM pg 449B) **Mini-Lesson**: Spark Your Learning (pg 450), Build Your Understanding (pg 451) **Guided Practice**: Check Understanding (pg451) **Independent Practice**: On Your Own (pg 452)
Suggested Modifications	Plan for Differentiated Instruction (TM pg 449)

| MA.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. |
| MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. |

LESSON 13.4

Student Learning Intentions (SLI) WALT: (We are learning to…)	13.4 We are learning to use proportional reasoning to find total earnings for someone earning a base salary plus a commission. Use proportional reasoning to find fees

	(including fees as percent and as a constant) and assess the reasonableness of answers.
Student Learning Strategies	Estimation Visual Model
Success Criteria	I can calculate commissions, fees, and total earnings and assess the reasonableness of my results.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 467, 468) Check Understanding (pg 468) Exit Ticket (TM pg 470)
Activities and Resources	**Warm-up**: Activate Prior Knowledge (TM pg 467B) **Mini-Lesson**: Build Your Understanding (pg 468) **Guided Practice**: Check Understanding (pg 469) **Independent Practice**: On Your Own (pg 469)
Suggested Modifications	Plan for Differentiated Instruction (TM pg 467)

MA.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.

LESSON 13.5

Student Learning Intentions (SLI) WALT: (We are learning to…)	13.5 We are learning to use proportional reasoning to calculate simple interest and the total value of an account earning simple interest, and assess the reasonableness of answers.
Student Learning Strategies	Estimation Visual Model
Success Criteria	I can calculate simple interest and the total value of an account after any period of time. I understand and can apply the equation I = Prt.
Formative Assessment (drives instructional decisions)	Turn and Talk (pg 473, 474) Check Understanding (pg 474) Exit Ticket (TM pg 476)

Activities and Resources	**Warm-up**: Activate Prior Knowledge (TM pg 473B) **Mini-Lesson**: Build Your Understanding (pg 473) **Guided Practice**: Check Understanding (pg 474) **Independent Practice**: On Your Own (pg 476)
Suggested Modifications	Plan for Differentiated Instruction (TM pg 473)

MA.7.RP.A.3   Use proportional relationships to solve multistep ratio and percent problems.