



Washington Township School District



The mission of the Washington Township Public Schools is to provide a safe, positive, and progressive educational environment that provides opportunity for all students to attain the knowledge and skills specified in the NJ Learning Standards at all grade levels, so as to ensure their full participation in an ever-changing world as responsible, self-directed, and civic-minded citizens.

Course Title:	Mathematics
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Grade Level(s):	7th Grade
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Duration:	<i>Full Year:</i>	✓	<i>Semester:</i>		<i>Marking Period:</i>	
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Course Description:	<p>The goal of the Grade 7 mathematics curriculum is to help students develop mathematical reasoning, as well as an understanding of the concepts, skills, and procedures in respect to the following areas:</p> <ul style="list-style-type: none"> Developing understanding of and applying proportional relationships. Developing understanding of operations with rational numbers. Working with expressions and linear equations. Solving problems involving scale drawings and informal geometric constructions. Working with two- and three- dimensional shapes to solve problems involving area, surface area, and volume. Drawing inferences about populations based on samples. <p>Subsequently, an awareness of and appreciation for the rich connections among mathematical strands as well as other disciplines will be developed. The seventh-grade mathematics curriculum development has been guided by the mathematical practice standards: All students should be able to make sense of problems and persevere in solving them, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of structure, look for and express regularity in repeated reasoning. Students should also have knowledge of and skill in the use of the vocabulary, forms of representation, materials, tools, techniques, and intellectual methods of the discipline of mathematics, including the ability to define and solve real-world problems with reason, insight, inventiveness, and technical proficiency.</p>
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Grading Procedures:	<p>Each semester will be a composite of quiz scores, test scores, homework, and participation reflecting a student’s mastery of the areas outlined above. The student can pass the course with an overall average of 70%. The individual teacher will explain the grading system to the student.</p>
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Primary Resources:

[New Jersey Student Learning Standards](#)

McGraw Hill Reveal Math Course 2

Washington Township Principles for Effective Teaching and Learning

- Implementing a standards-based curriculum
- Facilitating a learner-centered environment
- Using academic target language and providing comprehensible instruction
- Adapting and using age-appropriate authentic materials
- Providing performance-based assessment experiences
- Infusing 21st century skills for College and Career Readiness in a global society

Designed by:

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Under the Direction of:

Dr. Carole English

Written: _____ July 2022

Revised: _____

BOE Approval: _____

Unit Title:

Module 1 Proportional Relationships

Unit Description:

In this module, students will draw on their knowledge of ratios and rates to develop understanding of proportional relationships. They will use this understanding to build fluency with proportional relationships by representing them with tables, graphs, and equations, and finding the constant of proportionality.

Unit Duration: 14 days

Desired Results

Standard(s):

7.RP.A

Analyze proportional relationships and use them to solve real-world and mathematical problems.

Indicators:

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.3

Use proportional relationships to solve multi-step ratio and percent problems.

Understandings:

Students will understand that...

- Unit rates can be found when one or both quantities are fractions.
- Use of models and ratio reasoning can help you understand how a proportional relationship can exist between quantities.
- You can determine proportionality by analyzing the relationship between two quantities

Essential Questions:

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?

<p>represented in tables.</p> <ul style="list-style-type: none"> You can determine proportionality by analyzing the relationship between two quantities graphed on a coordinate plane. An equation can be written to represent a proportional relationship. Real world problems can be solved by applying their knowledge of proportional relationships. 	<p><i>How are the graphs of proportional and nonproportional linear relationships alike? How are they different?</i></p> <p><i>How are equations of proportional relationships different from those of nonproportional relationships?</i></p>
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Assessment Evidence

<p>Performance Tasks:</p> <ul style="list-style-type: none"> Warm-ups Exit Tickets Reveal Practice Assignments Formative Assessment Math Probe GoFormative Assignments 	<p>Other Evidence:</p> <ul style="list-style-type: none"> Independent Work Class Discussions Online Activities Practice Homework
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Benchmarks:
 Departmental assessment for Module 1 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 1-1: Unit Rates Involving Ratios of Fractions

- **LAUNCH**

Students will participate in a real-world discussion about the rate at which passenger trains can travel in Japan.

- **EXPLORE & DEVELOP**

- **Explore:** Find Unit Rates with Fractions

Students will use bar diagrams to explore how to find a unit rate when one or both quantities of a given rate are fractions.

- **Learn:** Unit Rates Involving Ratios of Fractions

Students will learn how to find a unit rate that involves ratios of fractions.

- **Example 1:** Find Unit Rates

Students will find a unit rate in which one of the given quantities is a fraction.

- **Example 2:** Find Unit Rates

Students will find a unit rate in which both of the given quantities are fractions.

- **Apply:** Kayaking

Students will come up with their own strategy to solve an application problem involving kayaking.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine the train's average unit rate in miles per hour.

- **Practice (SE p. 11 – 12)**

Find unit rates that involve ratios of fractions where one quantity is a fraction (1-5)

Find unit rates that involve ratios of fractions where both quantities are fractions. (6-7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving unit rates. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 1-2: Understand Proportional Relationships

- **LAUNCH**

Students will participate in a real-world discussion about proportional relationships between the ratio of blue paint to yellow paint to create a specific color green.

- **EXPLORE & DEVELOP**

- **Learn:** Proportional Relationships

- Students will understand what makes a relationship between two quantities a proportional relationship.*

- **Example 1:** Identify Proportional Relationships

- Students will identify whether a relationship is proportional by determining if the ratio between the two quantities is maintained.*

- **Example 2:** Identify Proportional Relationships

- Students will identify whether a relationship is proportional by determining if the ratio between the two quantities is maintained.*

- **Apply:** Construction

- Students will come up with their own strategy to solve an application problem involving constructing a deck.*

- **REFLECT & PRACTICE**

- **Exit Ticket**

- Students will determine if the ratios of blue paint to yellow paint form a proportional relationship.*

- **Practice (SE p. 19 – 20)**

- Determine if each situation represents a proportional relationship. (1-6)*

- Extend concepts learned in class to apply them to new contexts. (7)*

- Solve application problems involving proportional relationships. (8-9)*

- Use higher-order and critical thinking skills. (10-13)*

Module 1-3: Tables of Proportional Relationships

- **LAUNCH**

- Students will participate in a real-world discussion about proportional relationships between two car rental companies.*

- **EXPLORE & DEVELOP**

- **Explore:** Ratios in Tables

- Students will use a table to explore how to determine if the ratios between two quantities are equivalent.*

- **Learn:** Proportional Relationships and Tables

- Students will learn how to identify a proportional relationship from a table.*

- **Example 1:** Identify Proportional Relationships and Tables

- Students will identify a proportional relationship from a table.*

- **Example 2:** Identify Proportional Relationships and Tables
Students will identify a nonproportional relationship from a table.
- **Learn:** Identify the Constant of Proportionality
Students will learn how to find the constant of proportionality from a table or verbal description.
 - **Example 3:** Identify the Constant of Proportionality
Students will find the constant of proportionality from a verbal description.
 - **Example 4:** Identify the Constant of Proportionality
Students will find the constant of proportionality from a table.
- **Apply:** Sales Tax
Students will come up with their own strategy to solve an application problem involving sales tax.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain how to determine which relationship is proportional.
- **Practice (SE p. 29 – 30)**
Identify a proportional relationship from a table. (1-2)

Identify a nonproportional relationship from a table. (3-4)

Find the constant of proportionality from a verbal description. (5-6)

Find the constant of proportionality from a table. (7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving proportional relationships and tables. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 1-4: Graphs of Proportional Relationships

- **LAUNCH**
Students will participate in a real-world discussion about a proportional relationship between job pay and hours worked.
- **EXPLORE & DEVELOP**
 - **Explore:** Proportional Relationships, Tables and Graphs
Students will use Web Sketchpad to explore the graphs of proportional and nonproportional linear relationships.
 - **Learn:** Proportional Relationships and Graphs
Students will learn how to identify a proportional relationship from a graph.

- **Example 1:** Proportional Relationships and Graphs
Students will graph and identify a proportional relationship on the coordinate plane.
- **Example 2:** Proportional Relationships and Graphs
Students will graph and identify a nonproportional relationship on the coordinate plane.
- **Learn:** Find the Constant of Proportionality from Graphs
Students will learn how to identify the constant of proportionality from a graph.
 - **Example 3:** Find the Constant of Proportionality from Graphs
Students will find the constant of proportionality from a graph.
- **Explore:** Analyze Points
Students will use Web Sketchpad to explore and analyze the points $(0,0)$ and $(1,r)$ on a graph of a proportional relationship.
- **Learn:** Analyze Points on a Graph
Students will understand that significance of the points $(0,0)$ and $(1,r)$ on a graph of a proportional relationship.
 - **Example 4:** Analyze Points on a Graph
Students will identify and describe the significance of the points $(0,0)$ and $(1,r)$ on the graph of a proportional relationship.
- **Apply:** Fundraising
Students will come up with their own strategy to solve an application problem involving fundraising.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will explain how to determine the constant of proportionality from a graph.
 - **Practice (SE p. 39 – 40)**
Graph and identify a proportional relationship on the coordinate plane. (1)

Graph and identify a nonproportional relationship on the coordinate plane. (2)

Find the constant of proportionality from a graph. (3)

Identify and describe the significance of the points $(0,0)$ and $(1,r)$ on the graph of a proportional relationship. (4)

Solve application problems involving proportional relationships and graphs. (5)

Use high-order and critical thinking skills. (6-9)

Module 1-5: Equations of Proportional Relationships

- **LAUNCH**
Students will participate in a real-world discussion about the proportional relationship of one of the

fastest elevators in the world.

- **EXPLORE & DEVELOP**

- **Explore:** Proportional Relationships and Equations
Students will use Web Sketchpad to explore the equations of proportional relationships.
- **Learn:** Identify the Constant of Proportionality in Equations
Students will learn how to identify the constant of proportionality in equations.
 - **Example 1:** Identify the Constant of Proportionality in Equations
Students will identify the constant of proportionality in equations.
- **Learn:** Proportional Relationships and Equations
Students will learn how to write equations to represent proportional relationships.
 - **Example 2:** Proportional Relationships and Equations
Students will write equations to represent proportional relationships.
 - **Example 3:** Proportional Relationships and Equations
Students will write equations for proportional relationships to find a missing value.
- **Apply:** Running
Students will come up with their own strategy to solve an application problem involving running.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain the meaning of the constant of proportionality.
- **Practice (SE p. 47 – 48)**
Identify the constant of proportionality in equations. (1-2)

Write equations to represent the proportional relationships. (3-4)

Write equations for proportional relationships to find a missing value. (5-6)

Extend concepts learned in class to apply them in new contexts. (7)

Solve application problems involving proportional relationships and equations. (8-9)

Use higher-order and critical thinking skills. (10-13)
- **Formative Assessment Math Probe**
Students will determine which item(s) in each set show a proportional relationship and explain their choices.

Module 1-6: Solve Problems Involving Proportional Relationships

- **LAUNCH**

Students will participate in a real-world discussion about using information from an infographic on the

Golden Ratio to find forearm length.

- **EXPLORE & DEVELOP**

- **Learn:** Proportions

- Students will understand how to make a table, use a graph, or write an equation to solve problems involving proportional relationships.*

- **Example 1:** Solve Problems Involving Proportional Relationships

- Students will solve problems involving proportional relationships using a table, graph, or an equation.*

- **Example 2:** Solve Problems Involving Proportional Relationships

- Students will choose a strategy for solving a problem involving a proportional relationship, such as writing an equation.*

- **Apply:** Blood Drives

- Students will come up with their own strategy to solve an application problem involving blood drives.*

- **REFLECT & PRACTICE**

- **Exit Ticket**

- Students explain how to determine the length of a woman's hand if her forearm is 17 cm long.*

- **Practice (SE p. 55 – 56)**

- Solve problems involving proportional relationships using any strategy. (1-4)*

- Extend concepts learned in class to apply them in new contexts. (5-6)*

- Solve application problems involving proportional relationships. (7-8)*

- Use higher-order and critical thinking skills. (9-12)*

Module 1 Review

Module 1 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators





Unit Modifications for Special Population Students

Advanced Learners



Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities

	<ul style="list-style-type: none"> • Extension Activities  Use IXL to enhance targeted skills.
Struggling Learners	 Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities: <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  Use IXL to enhance targeted skills.
English Language Learners	 Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities: <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
Special Needs Learners	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
Learners with a 504	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections

Indicators:

Health and Physical Education (Grades 6-8)

2.1.8.PGD.4

Analyze the relationship between healthy behaviors and personal health.

2.1.8.EH.2

Analyze how personal attributes, resiliency and protective factors support mental and emotional health.

Social Studies (Grades 6-8)

6.2.8.HistoryCC.1.a

Describe the influence of the agricultural revolution on population growth and the subsequent development of civilizations (e.g., the impact of food surplus from farming).

6.2.8.HistoryCA.2.a

Analyze the factors that led to the rise and fall of various early river valley civilizations and determine whether there was a common pattern of growth and decline.

6.2.8.GeoPP.3.b

Explain how geography and the availability of natural resources led to both the development of classical civilizations and to their decline.

6.2.8.HistoryCC.4.b

Explain how and why the interrelationships among improved agricultural production, population growth, urbanization, and commercialization led to the rise of power states and kingdoms (i.e., Europe, Asia, Americas)

6.2.8.History.CC.4.c

Assess the demographic, economic and religious impact of the plague on Europe.

Science (Grades 6-8)

MS-PS3-1

Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

MS-LS2-1

Analyze and interpret data to provide evidence for the effects of resources availability an organism and populations of organisms in an ecosystem.

MS-LS4-3

Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

MS-ESS3-4

Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's system.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, and communication.

Unit Title:

Module 2 Solve Percent Problems

Unit Description:

In this module, students will draw on their *understanding* of proportional relationships to build *fluency* with using ratio reasoning and properties of operations to solve algebraic equations involving percents. They *apply* their fluency to solve multi-step ratio and percent problems.

Unit Duration: 13 days

Desired Results

Standard(s):

7.RP.A

Analyze proportional relationships and use them to solve real-world and mathematical problems.

7.EE.A

Use properties of operations to generate equivalent expressions.

7.EE.B

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Indicators:

7.RP.A.3

Use proportional relationships to solve multi-step ratio and percent problems.

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.

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.

Understandings:

Students will understand that...

- You can solve problems involving percent of increase and percent of decrease.
- You can solve multi-step ratio and percent problems involving taxes.
- You can solve multi-step ratio and percent problems involving tips and markups.
- You can solve multi-step ratio and percent problems involving discounts.
- You can solve problems involving simple interest.
- You can solve problems involving commission and fees.
- You can solve problems involving percent error.

Essential Questions:

- 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?*

Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 2 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Formative Assessment Math Probe (Use in Beginning, Middle or End of Module)

Students will determine the best choice for an estimate for each item (without calculating) and explain their choices.

Module 2-1: Percent of Change

- **LAUNCH**

Students will participate in a real-world discussion about inflation of ticket prices as a percent of change.

- **EXPLORE & DEVELOP**

- **Explore:** Percent of Change

Students will use bar diagrams to explore percent of change.

- **Learn:** Percent of Increase

Students will understand how percent of change (increase) compares the change in quantity to the original amount.

- **Example 1:** Percent of Increase

Students will find the percent of increase in a real-world context (student enrollment).

- **Example 2:** Percent of Increase

Students will find the percent of increase in a real-world context (cost of gas).

- **Learn:** Percent Decrease

Students will understand how percent of change (decrease) compares the change in quantity to the original amount.

- **Example 3:** Percent of Decrease

Students will find the percent of decrease in a real-world context (volume of liquid).

- **Apply:** Movies

Students will come up with their own strategy to solve an application problem involving the change in the length of movies over time.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine if the percent of change in movie ticket prices between 1985 and 2000 will be the same as the percent change in movie ticket prices between 2000 and 2015.

- **Practice (SE p. 71 – 72)**

Find the percent of change. (1-3)

Find the percent of increase. (4-7)

Find the percent of decrease. (8-9)

Extend concepts learned in class to apply them in new contexts. (10)

Solve application problems involving the percent of change. (11-12)

Use higher-order and critical thinking skills. (13-16)

Module 2-2: Tax

- **LAUNCH**

Students will participate in a real-world discussion about taxes and how they are related to percents.

- **EXPLORE & DEVELOP**

- **Explore:** Sales Tax

Students will use Web Sketchpad to explore how sales tax affects the total cost of an item.

- **Learn:** Sales Tax

Students will learn how to find sales tax.

- **Example 1:** Sales Tax

Students will find the total cost for an item given the item's cost and the percent of sales tax.

- **Example 2:** Hotel Tax

Students will find the total cost of a hotel room given the cost of the room and the percent of tax.

- **Example 3:** Sale Tax

Students will find the total cost of an item given the item's cost and the percent of sales tax.

- **Apply:** Shopping

Students will come up with their own strategy to solve an application problem involving the total cost of a purchase at a grocery store.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine the total cost of all items (school supplies and lunch meat) including sales tax.

- **Practice (SE p. 81 – 82)**

Find the total cost for an item given the item's cost and percent of sales tax. (1-3)

Find the total cost for an item given the item's cost and the percent of sales tax. (4-5, 8-9)

Find the total cost of a hotel room with the hotel room tax. (6-7)

Solve application problems involving tax. (10-11)

Module 2-3: Tips and Markups

- **LAUNCH**

Students will participate in a real-world discussion about tips for services in everyday life.

- **EXPLORE & DEVELOP**

- **Learn: Tips**

Students will understand that tips are usually based on a percent of the service provided.

- **Example 1: Tips**

Students will find the total cost of a services including a percent tip.

- **Learn: Markup**

Students will understand that the selling price of an item is equal to the item's wholesale cost plus the percent markup.

- **Example 2: Markup**

Students will find the selling price of an item given the wholesale cost of an item and percent markup.

- **Example 3: Markup**

Students will find the percent of markup of an item given the selling price and the wholesale cost.

- **Apply: Dining Out**

Students will come up with their own strategy to solve an application problem involving tips.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will find the total amount needed to pay for lunch.

- **Practice (SE p. 29 – 30)**

Find the total cost including a tip or markup based on a percent. (1-3)

Find the total cost of a service including a tip based on a percent. (4-5)

Find the selling price of an item given the wholesale cost of an item and a markup based on a percent. (6-7)

Find the percent of markup on an item given the selling price of an item and the wholesale cost. (8-9)

Extend concepts learned in class to apply them in new contexts. (10)

Solve application problems involving tips or markups. (11-12)

Use higher-order and critical thinking skills. (13-16)

Module 2-4: Discounts

- **LAUNCH**

Students will participate in a real-world discussion about discounts.

- **EXPLORE & DEVELOP**

- **Learn:** Discounts

Students will understand that a discount is an amount by which the price of an item is decreased and is often represented as a percent of the original price.

- **Example 1:** Discounts

Students will find the sale price of an item given the original cost and a percent discount.

- **Example 2:** Combined Discounts

Students will find the sale price of an item given the original cost and more than one discount applied.

- **Example 3:** Find the Original Price

Students will find the original price given the percent discount and the sale price.

- **Apply:** Shopping

Students will come up with their own strategy to solve an application problem that involves comparing prices after a discount.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will explain how to determine if they have enough money to buy a T-shirt before tax.

- **Practice (SE p. 97 – 98)**

Find the sale price of an item given the original cost and a discount based on a percent. (1-5)

Find the sale price of an item given the original cost and more than one discount based on a percent. (6-7)

Find the original price given the percent discount and the sale price. (8-9)

Extend concepts learned in class to apply them in new contexts. (10)

Solve application problems involving discounts. (11-12)

Use high-order and critical thinking skills. (13-16)

Module 2-5: Interest

- **LAUNCH**

Students will participate in a real-world discussion about interest.

- **EXPLORE & DEVELOP**

- **Explore:** Interest

Students will use Web Sketchpad to explore the simple interest formula.

- **Learn:** Simple Interest

Students will understand what simple interest is and learn how to use the simple interest formula.

- **Example 1:** Find Simple Interest

Students will use an annual simple interest rate to find the amount of simple interest owed when the time is written as a whole number.

- **Example 2:** Find Simple Interest

Students will use an annual simple interest rate to find the amount of simple interest owed when the time is written as a fraction.

- **Example 3:** Find Simple Interest

Students will use an annual simple interest rate to find the amount of simple interest owed when the rate is written as a fraction.

- **Apply:** Car Shopping

Students will come up with their own strategy to solve an application problem that involves purchasing a car.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine which account will pay more to deposit over the course of a year.

- **Practice (SE p. 105 – 106)**

Use an annual simple interest rate to find the amount of simple interest owed when time is written as a whole number. (1-5)

Use an annual simple interest rate to find the amount of simple interest owed when time is written as a fraction. (6-7)

Use an annual simple interest rate to find the amount of simple interest owed when the rate is written as a fraction. (8-9)

Extend concepts learned in class to apply them in new contexts. (10)

Solve application problems involving simple interest. (11-12)

Use higher-order and critical thinking skills. (13-16)

Module 2-6: Commission and Fees

- **LAUNCH**

Students will participate in a real-world discussion about wages paid as commission.

- **EXPLORE & DEVELOP**

- **Learn:** Commission and Fees

Students will understand what commission and fees are, and how they are often calculated using percents.

- **Example 1:** Find Commission

Students will find the amount of commission, given the total sales and percent of commission.

- **Example 2:** Find the Amount of Sales

Students will find the total amount of sale, given the amount of commission and the percent of commission.

- **Example 3:** Fees

Students will find the amount of a fee, given the conditions on which the fee is based and the percent of the fee.

- **Apply:** Personal Finance

Students will come up with their own strategy to solve an application problem that involves commission rates.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine weekly pay given a base salary plus commission of sale per week.

- **Practice (SE p. 105 – 106)**

Find the amount of commission given total sales and the percent commission. (1-2)

Find the total amount of sales given the amount of commission and the percent commission. (3-5)

Find the amount of a fee given the amount on which the fee is based and the percent of the fee. (6-8)

Solve application problems involving commission or fees. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 2-7: Percent Error

- **LAUNCH**

Students will participate in a real-world discussion about using a percent to compare an estimate to an

actual value in everyday life situations.

- **EXPLORE & DEVELOP**

- **Explore:** Percent Error
Students will use Web Sketchpad to explore percent error.
- **Learn:** Percent Error
Students will understand that percent error can help them compare the inaccuracy of an estimate, or amount of error, to the actual amount.
 - **Example 1:** Percent Error
Students will find the percent error given the estimated value and the actual amount.
- **Apply:** Sports
Students will come up with their own strategy to solve an application problem involving percent error of estimating the number of wins a sports team will have in a season.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students explain how to determine the percent error from an estimated number of jellybeans in a jar.
- **Practice (SE p. 119 – 120)**
Find the percent error given the estimated value and the actual amount. (1-7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving percent error. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 2 Review

Module 2 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators





Unit Modifications for Special Population Students

Advanced Learners



Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities

	 Use IXL to enhance targeted skills.
Struggling Learners	 Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities: <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  Use IXL to enhance targeted skills.
English Language Learners	 Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities: <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
Special Needs Learners	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
Learners with a 504	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections

Indicators:

Social Studies (Grades 6-8)

6.1.8.EconET.4.a

Analyze the debates involving the National Bank, uniform currency and tariffs and determine the extent to which each of these economic tools met the economic challenges facing the new nation.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and critical thinking.

Unit Title:

Module 3 Operations with Integers

Unit Description:

In this module, students will draw on their knowledge of rational numbers (gained in Grade 6) to develop *understanding* of operations with integers. They use this understanding to build *fluency* with integer operations and the order of operations. They will *apply* their fluency to solve multi-step problems involving integer operations.

Unit Duration: 15.5 days

Desired Results

Standard(s):

7.NS.A

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

7.EE.B

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Indicators:

7.NS.A.1

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

7.NS.A.2

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.

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 computation and estimation strategies.

Understandings:

Students will understand that...

- You can solve problems by adding integers.
- You can solve problems by subtracting integers.
- You can solve problems by multiplying integers.
- You can solve problems by dividing integers.
- You can solve problems by applying all operations to integers.

Essential Questions:

How are operations with integers related to operations with whole numbers?

How can algebra tiles be used to model integer addition?

How can you use algebra tiles to model integer subtraction?

How is the distance between two integers on a number line related to the difference between the two numbers?

How can you determine the sign of the product of two integers?

How can you use algebra tiles to model integer division?

Assessment Evidence**Performance Tasks:**

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 3 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 3-1: Add Integers

- **LAUNCH**

Students will participate in a real-world discussion about integers as they relate to football.

- **EXPLORE & DEVELOP**

- **Explore:** Use Algebra Tiles to Add Integers

Students will use algebra tiles to explore how to add integers.

- **Learn:** Add Integers with the Same Sign

Students will understand that they can use a number line to add integers with the same sign.

- **Example 1:** Add Integers with the Same Sign

Students will add integers with the same sign.

- **Example 2:** Add Integers with the Same Sign.

Students will add integers with the same sign to solve a real-world problem.

- **Learn:** Find Additive Inverses

Students will understand that an integer and its opposite are called additive inverses, and their sum is zero.

- **Example 3:** Find Additive Inverses

Students will find the additive inverse of an integer in a real-world context.

- **Learn:** Add Integers with Different Signs

Students will understand that they can use a number line to add integers with different signs.

- **Example 4:** Add Integers with Different Signs

Students will add integers with different signs.

- **Example 5:** Add Integers with Different Signs

Students will add integers with different signs to solve a real-world problem.

- **Example 6:** Add Three or More Integers
Students will add three or more integers.
- **Example 7:** Add Three or More Integers
Students will add three or more integers to solve a real-world problem.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will determine the number of yards a team has moved the ball on two plays.
- **Practice (SE p. 137 – 138)**
Add integers with the same sign. (1-2)

Add integers with different signs. (3-4)

Add three or more integers. (5-6)

Add integers with the same sign to solve a real-world problem. (7-8)

Find the additive inverse of an integer in a real-world context. (9-10)

Practice adding integers with different signs to solve a real-world problem. (11-12)

Add three or more integers to solve a real-world problem. (13)

Extend concepts learned in class to apply them in new contexts. (14)

Solve application problems involving adding integers. (15-16)

Use higher-order and critical thinking skills. (17-20)

Module 3-2: Subtract Integers

- **LAUNCH**
Students will participate in a real-world discussion about integers using an infographic.
- **EXPLORE & DEVELOP**
 - **Explore:** Use Algebra Tiles to Subtract Integers
Students will use algebra tiles to explore how to subtract integers.
 - **Learn:** Subtract Integers
Students will understand that they can use a number line to subtract integers.
 - **Example 1:** Subtract Integers
Students will subtract a negative integer from a positive integer.

- **Example 2:** Subtract Integers
Students will subtract a negative integer from a negative integer.
- **Example 3:** Subtract Expressions
Students will evaluate an algebraic expression that involves subtracting integers.
- **Explore:** Find Distance on a Number Line
Students will explore how the distance between integers on a number line is related to their difference.
- **Learn:** Find the Distance Between Integers
Students will learn how to find the distance between two integers on a number line.
 - **Example 4:** Find the Distance Between Integers
Students will find the distance between two integers on a number line.
 - **Example 5:** Find the Distance Between Integers
Students will find the distance between two integers to solve a real-world problem.
- **Apply:** The Solar System
Students will come up with their own strategy to solve an application problem involving temperature of celestial objects.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will explain how to find the distance between the elevations above sea level in New Orleans and Britton Hill.
 - **Practice (SE p. 147 – 148)**
Subtract integers. (1-9)

Evaluate algebraic expressions involving subtraction. (10-11)

Find the distance between two integers on a number line. (12-13)

Find the distance between two integers to solve a real-world problem. (14)

Extend concepts learned in class to apply them to new contexts. (15)

Solve application problems that involve subtracting integers. (16-17)

Use higher-order and critical thinking skills. (18-21)

Module 3-3: Multiply Integers

- **LAUNCH**
Students will participate in a real-world discussion about hair growth and hair loss.

- **EXPLORE & DEVELOP**

- **Explore:** Use Algebra Tiles to Multiply Integers
Students will use algebra tiles to explore how to multiply integers.
- **Learn:** Multiply Integers with Different Signs
Students will understand how a number line and repeated addition can be used to multiply integers with different signs.
 - **Example 1:** Multiply Integers with Different Signs
Students will multiply integers with different signs.
 - **Example 2:** Multiply Integers with Different Signs
Students will multiply integers with different signs to solve a real-world problem.
- **Learn:** Multiply Integers with the Same Sign
Students will use patterns to understand that the product of two integers with the same sign is positive.
 - **Example 3:** Multiply Integers with the Same Sign
Students will multiply integers with the same sign.
 - **Example 4:** Multiply Integers with the Same Sign
Students will evaluate an algebraic expression that involves multiplying integers.
 - **Example 5:** Multiply Three or More Integers
Students will multiply three or more integers.
 - **Example 6:** Multiply Three or More Integers
Students will evaluate an algebraic expression that involves multiplying three or more integers.
- **Learn:** Use Properties to Multiply Integers
Students will understand how the properties of operations can be applied to multiply integers.
- **Apply:** Agriculture
Students will come up with their own strategy to solve an application problem involving revenue, expenses, and savings for a farm.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain how to determine what integer represents the change in amount of dog hair loss per week.
- **Practice (SE p. 157 – 158)**
Multiply integers. (1-9)

Evaluate algebraic expressions involving multiplication of two integers. (10-11)

Evaluate algebraic expressions involving multiplication of three or more integers. (12-13)

Multiply integers with different signs to solve a real-world problem. (14)

Extend concepts learned in class to apply them in new contexts. (15)

Solve application problems involving multiplying integers. (16-17)

Use higher-order and critical thinking skills. (18-21)

Module 3-4: Divide Integers

- **LAUNCH**

Students will participate in a real-world discussion about changes in temperatures as related to integers.

- **EXPLORE & DEVELOP**

- **Explore:** Use Algebra Tiles to Divide

Students will use algebra tiles to explore how to divide integers.

- **Learn:** Divide Integers with Different Signs

Students will understand how they can use related multiplication sentences to determine how to divide integers with different signs.

- **Example 1:** Divide Integers with Different Signs

Students will divide integers with different signs.

- **Example 2:** Divide Integers with Different Signs

Students will divide integers with different signs to solve a real-world problem.

- **Learn:** Divide Integers with the Same Sign

Students will understand how they can use related multiplication sentences to determine how to divide integers with the same sign.

- **Example 3:** Divide Integers with the Same Sign

Students will divide integers with the same sign.

- **Example 4:** Divide Integers with the Same Sign

Students will evaluate an algebraic expression involving division of integers.

- **Apply:** Persona Finance

Students will come up with their own strategy to solve an application problem involving managing a bank account.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will explain how to determine the average change in temperature per hour.

- **Practice (SE p. 165 – 166)**
Divide integers with different signs. (1-3)

Divide integers with the same sign. (4-6)

Evaluate algebraic expressions involving division of integers. (7-12)

Divide integers with different signs to solve real-world problems. (13)

Extend concepts learned in class to apply them in new contexts. (14)

Solve application problems involving dividing integers. (15-16)

Use high-order and critical thinking skills. (17-20)
- **Formative Assessment Math Probe**
Students will determine whether each simplified expression is positive or not, without actually calculating.

Module 3-5: Apply Integer Operations

- **LAUNCH**
Students will participate in a real-world discussion about using the order of integer operations with temperature change.
- **EXPLORE & DEVELOP**
 - **Example 1: Order of Integer Operations**
Students will apply the order of operations to evaluate a numerical expression involving integers.
 - **Example 2: Order of Integer Operations**
Students will apply the order of operations to evaluate a numerical expression involving integers.
 - **Example 3: Order of Integer Operations**
Students will evaluate an algebraic expression involving the four operations with integers.
 - **Example 4: Order of Integer Operations**
Students will solve a real-world problem involving operations with integers.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will explain the meaning of the constant of proportionality.
 - **Practice (SE p. 169 – 170)**
Apply the order of operations to evaluate numerical expressions involving integers. (1-6)

Evaluate algebraic expressions involving the four operations with integers. (7-12)

Solve real-world problems involving operations with integers. (13-14)

Solve application problems that involve applying integer operations. (15-16)

Use higher-order and critical thinking skills. (17-20)

Module 3 Review

Module 3 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

Advanced Learners



Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities





Use IXL to enhance targeted skills.

Struggling Learners



Refer to orange **AL** (*Approaching Level*) indicators in Teacher Edition and assign corresponding activities:

- Remediation Activities
- Extra Examples
- *Arrive Math* Take Another Look Mini Lessons

	 <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
<p>Learners with a 504</p>	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections	
<p>Indicators:</p>	
<p><u>Health and Physical Education (Grades 6-8)</u></p>	
<p>2.3.8.ATD.5 <i>Analyze how the influence of peers and different social outcomes (e.g., home, school, party) can result in positive and/or negative outcomes.</i></p>	

Social Studies (Grades 6-8)

6.1.8.EconET.3.a

Identify the effect of inflation and debt on the American people and evaluate the policies of state and national governments during this time.

Science (Grades 6-8)

MS-PS2-2

Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, and communication.

Unit Title:

Module 4 Operations with Rational Numbers

Unit Description:

In this module, students draw on their knowledge of rational numbers (gained in Grade 6) and their knowledge of integers (gained in Module 3) to develop an *understanding* of performing mathematical operations with rational numbers. They will use that understanding to build *fluency* in using mathematical operations with rational numbers.

Unit Duration: 12 days

Desired Results

Standard(s):

7.NS.A

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

7.EE.B

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Indicators:

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.3

Use proportional relationships to solve multi-step ratio and percent problems.

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 computation and estimation strategies.

Understandings:

Students will...

- Identify terminating and repeating decimals and use long division to convert rational numbers to decimals.
- Demonstrate application of the additive inverse and an understanding of addition of rational numbers.
- Demonstrate understanding of subtraction of rational numbers as adding the additive inverse and apply it to solving real-world problems.
- Apply understanding of multiplication to rational numbers and use the order of operations to solve real-world problems.
- Apply understanding of division to rational numbers and use the order of operations to solve real-world problems.
- Apply understanding of the four operations with rational numbers to evaluate mathematical expressions.

Essential Questions:

How are operations with rational numbers related to operations with integers?

What are the patterns in the decimal form of a rational number?

How can you extend the concepts in class to apply them in new contexts?

<p>Performance Tasks:</p> <ul style="list-style-type: none"> • Warm-ups • Exit Tickets • Reveal Practice Assignments • Formative Assessment Math Probe • GoFormative Assignments 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Independent Work • Class Discussions • Online Activities • Practice • Homework
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Benchmarks:

Departmental assessment for Module 4 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 4-1: Rational Numbers

- **LAUNCH**
Students will participate in a real-world discussion about finding the batting average as a decimal.
- **EXPLORE & DEVELOP**
 - **Explore:** Rational Numbers Written as Decimals
Students will use Web Sketchpad to explore how to convert a rational number to a decimal.
 - **Learn:** Rational Numbers
Students will learn how to identify rational numbers.
 - **Learn:** Rational Numbers Written as Decimals
Students will understand that the decimal form of a rational number either terminates in 0s or eventually repeats.
 - **Example 1:** Write Fractions as Decimals
Students will use long division to convert a fraction to a decimal and determine if the decimal is terminating.
 - **Example 2:** Write Fractions as Decimals
Students will use long division to convert a fraction to a decimal and determine if the decimal is terminating.
 - **Apply:** Crafting
Students will come up with their own strategy to solve an application problem involving the sizes of different signs at a craft show.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine a baseball player's batting average given a hits and b at-bats.

- **Practice (SE p. 183 – 184)**

Use long division to convert a fraction to a decimal and determine if the decimal is terminating. (1-12)

Extend concepts learned in class to apply them in new contexts. (13)

Solve application problems involving rational numbers. (14-15)

Use higher-order and critical thinking skills. (16-19)

Module 4-2: Add Rational Numbers

- **LAUNCH**

Students will participate in a real-world discussion about stock value after the rising and falling of price per share.

- **EXPLORE & DEVELOP**

- **Learn:** Rational Numbers and Additive Inverses

Students will learn how to find the additive inverse of a rational number.

- **Example 1:** Find Additive Inverses

Students will find the additive inverse of rational numbers.

- **Example 2:** Find Additive Inverses

Students will find the additive inverse of rational numbers.

- **Learn:** Add Rational Numbers

Students will understand that they can apply what they know about adding fractions, decimals, and integers to the set of rational numbers.

- **Example 3:** Add Rational Numbers

Students will add rational numbers written as like fractions and mixed numbers.

- **Example 4:** Add Rational Numbers

Students will add rational numbers written as unlike fractions and mixed numbers.

- **Example 5:** Add Rational Numbers

Students will add rational numbers written in different forms.

- **Learn:** Add Rational Numbers

Students will learn how to use the properties of operations to add three or more rational numbers.

- **Example 6:** Add Rational Numbers
Students will add three rational numbers written in different forms.
- **Example 7:** Add Rational Numbers
Students will add four rational numbers written in different forms to solve a real-world problem.

- **Apply:** Animal Care
Students will come up with their own strategy to solve an application problem involving the change in weight of a cat.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will determine the value of the stock at the end the day.

- **Practice (SE p. 195 – 196)**
Find the additive inverse of rational numbers. (1-6)

Add rational numbers written in different forms. (7-14)

Add four rational numbers written in different forms to solve a real-world problem. (15)

Extend concepts learned in class to apply them to new contexts. (16)

Solve application problems involving the addition of rational numbers. (17-18)

Use higher-order and critical thinking skills. (19-22)

Module 4-3: Subtract Rational Numbers

- **LAUNCH**
Students will participate in a real-world discussion about finding changes in temperature.

- **EXPLORE & DEVELOP**

- **Learn:** Subtract Rational Numbers
Students will learn how to subtract rational numbers.

- **Example 1:** Subtract Rational Numbers
Students will subtract rational numbers written as decimals.
- **Example 2:** Subtract Rational Numbers
Students will subtract rational numbers written as unlike fractions and mixed numbers.
- **Example 3:** Evaluate Expressions
Students will evaluate an algebraic expression involving subtraction of rational numbers.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will explain how to determine how to find the change in temperature.

- **Practice (SE p. 201 – 202)**

Subtract rational numbers written as decimals. (1-4)

Subtract rational numbers written as unlike fractions and mixed numbers. (5-12)

Evaluate algebraic expressions involving subtraction by substituting rational numbers and simplifying. (13, 15)

Extend concepts learned in class to apply them in new contexts. (14)

Solve application problems involving subtracting rational numbers. (16-17)

Use higher-order and critical thinking skills. (18-21)

Module 4-4: Multiply Rational Numbers

- **LAUNCH**

Students will participate in a real-world discussion about multiplying quantities in a recipe to serve more people.

- **EXPLORE & DEVELOP**

- **Learn: Multiply Rational Numbers**

Students will understand that they can apply what they know about multiplying fractions, decimals, and integers to the set of rational numbers.

- **Example 1: Multiply Rational Numbers**

Students will multiply rational numbers written as fractions.

- **Example 2: Multiply Rational Numbers**

Students will multiply rational numbers written as mixed numbers.

- **Learn: Multiply Rational Numbers**

Students will understand when it is more efficient to write numbers as fractions or decimals when multiplying rational numbers written in different forms.

- **Example 3: Multiply Rational Numbers**

Students will multiply rational numbers written in different forms.

- **Example 4: Multiply Rational Numbers**

Students will evaluate an algebraic expression involving multiplication of rational numbers.

- **Example 5: Multiply Rational Numbers**

Students will evaluate an algebraic expression involving different forms of rational

numbers.

- **Apply:** Temperature
Students will come up with their own strategy to solve an application problem involving a city's change in temperature overnight.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain how to determine the amount of cooked pasta you will need if you triple the recipe.

- **Practice (SE p. 211 – 212)**
Multiply rational numbers written as fractions. (1-3)

Multiply rational numbers written as mixed numbers. (4-6)

Multiply rational numbers written in different forms. (7-9)

Evaluate algebraic expressions involving multiplication of rational numbers. (10-12)

Evaluate algebraic expressions involving different forms of rational numbers. (13)

Extend concepts learned in class to apply them in new contexts. (14)

Solve application problems involving multiplying rational numbers. (15-16)

Use high-order and critical thinking skills. (17-20)

Module 4-5: Divide Rational Numbers

- **LAUNCH**

Students will participate in a real-world discussion about dividing up payments for a bike.

- **EXPLORE & DEVELOP**

- **Learn:** Divide Rational Numbers
Students will understand that they can apply what they know about dividing fractions, decimals, and integers to the set of rational numbers.

- **Example 1:** Divide Rational Numbers
Students will divide rational numbers written as fractions.

- **Example 2:** Divide Rational Numbers
Students will divide rational numbers written as mixed numbers.

- **Learn:** Divide Rational Numbers
Students will understand when it is more efficient to write numbers as fractions or decimals

when dividing rational numbers written in different forms.

- **Example 3: Divide Rational Numbers**
Students will evaluate an algebraic expression involving division of rational numbers.

- **Apply: Finance**
Students will come up with their own strategy to solve an application problem involving the change in value of shares of stock.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will write a division sentence involving negative rational numbers about borrowing money and explain why negative numbers are used.

- **Practice (SE p. 219 – 220)**
Divide rational numbers written as fractions. (1-5)

Divide rational numbers written as mixed numbers. (6-12)

Evaluate algebraic expressions involving division of rational numbers. (13, 15)

Extend concepts learned in class to apply them in new contexts. (14)

Solve application problems involving dividing rational numbers. (16-17)

Use higher-order and critical thinking skills. (18-21)

- **Formative Assessment Math Probe**
Students will determine the best choice for an estimate for each expression (without calculating) by estimating a product or quotient involving reasoning about the size and sign of rational numbers and the effect of multiplication and division.

Module 4-6: Apply Rational Number Operations

- **LAUNCH**

Students will participate in a real-world discussion about using rational number operations to find differences in extreme temperatures.

- **EXPLORE & DEVELOP**

- **Learn: Apply Rational Number Operations**
Students will understand how to apply the properties of operations to evaluate expressions involving rational numbers.

- **Example 1: Apply Rational Number Operations**
Students will use the properties of operations to evaluate expressions involving different forms of rational numbers.

- **Example 2: Apply Rational Number Operations**
Students will use the properties of operations to evaluate expressions involving different forms of rational numbers.

- **Apply: Food**
Students will come up with their own strategy to solve an application problem that involves changing amounts in a recipe.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students explain how to determine the difference between two temperatures using the formula $F = \frac{9}{5}C + 32$ to convert Celsius temperatures to Fahrenheit.

- **Practice (SE p. 225 – 226)**
Use the properties of operations to evaluate expressions involving rational numbers. (1-6)

Use the properties of operations to evaluate expressions involving different forms of rational numbers. (7-12)

Extend concepts learned in class to apply them in new contexts. (13)

Solve application problems that involve applying rational number operations. (14-15)

Use higher-order and critical thinking skills. (16-19)

Module 4 Review

Module 4 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

Advanced Learners






Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities



Use IXL to enhance targeted skills.

<p>Struggling Learners</p>	 <p>Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (<i>IEP</i>) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
<p>Learners with a 504</p>	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections

Indicators:

Technology Education

9.3.ST-SM.2 Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.

9.4.12.O.11 Apply active listening skills to obtain and clarify information.

Science

MS-ETS1-3 Analyze data from test to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet criteria for success.

Computer Science and Design Thinking:

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.5 Test, analyze, and refine computational models

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration and communication.

Unit Title:

Module 5 Simplifying Algebraic Expressions

Unit Description:

In this module, students draw on their knowledge of operations with algebraic expressions, greatest common factors, and the distributive property (all gain in grade 6) to gain an *understanding* of simplifying algebraic expressions which includes distributing integers across algebraic expressions, adding, and subtracting algebraic expressions, combining like terms, and factoring algebraic expressions.

Unit Duration: 11.5 days

Desired Results

<p>Standard(s):</p> <p>7.EE.A <i>Use properties of operations to generate equivalent expressions.</i></p>	
<p>Indicators:</p> <p>7.EE.A.1 <i>Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</i></p> <p>7.EE.A.2 <i>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.</i></p>	
<p>Understandings: <i>Students will...</i></p> <ul style="list-style-type: none"> • Simplify algebraic expressions by combining like terms and using the Distributive Property. • Add linear expressions and express the sum in simplest form. • Subtract linear expressions and express the difference in simplest form. • Find the GCF of monomials and factor algebraic expressions. • Combine operations to simplify linear expressions. 	<p>Essential Questions:</p> <p><i>Why is it beneficial to rewrite expressions in different forms?</i></p> <p><i>How can algebra tiles be used to simplify an expression?</i></p> <p><i>How can you use a Magic Square puzzle to add expressions?</i></p> <p><i>How can algebra tiles help you factor linear expressions?</i></p>
<p>Assessment Evidence</p>	
<p>Performance Tasks:</p> <ul style="list-style-type: none"> • Warm-ups • Exit Tickets • Reveal Practice Assignments • Formative Assessment Math Probe • GoFormative Assignments 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Independent Work • Class Discussions • Online Activities • Practice • Homework

Benchmarks:

Departmental assessment for Module 5 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 5-1: Simplify Algebraic Expressions

- **LAUNCH**

Students will participate in a real-world discussion about using an expression to represent a youth organization's cookie sales.

- **EXPLORE & DEVELOP**

- **Explore:** Simplify Algebraic Expressions

Students will use algebra tiles to explore how to simplify algebraic expressions.

- **Learn:** Like Terms

Students will understand what a term is and how to identify like terms.

- **Learn:** Combine Like Terms

Students will learn how to combine like terms.

- **Example 1:** Combine Like Terms

Students will combine like terms to simplify an expression representing a real-world scenario.

- **Example 2:** Combine Like Terms

Students will combine like terms with integer coefficients and constants.

- **Example 3:** Combine Like Terms

Students will combine like terms with rational coefficients and constants.

- **Learn:** Expand Linear Expressions

Students will understand how to expand linear expressions using the Distributive Property.

- **Example 4:** Distribute Over Addition

Students will expand linear expressions by distributing over addition.

- **Example 5:** Distribute Over Subtraction

Students will expand linear expressions by distributing over subtraction.

- **Example 6: Distribute Negative Numbers**
Students will expand linear expressions by distributing a negative number.

- **Apply: Geometry**
Students will come up with their own strategy to solve an application problem involving side lengths of triangles.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will write an expression that represents the cookies sales for two girls.

- **Practice (SE p. 241 – 242)**
Combine like terms in a real-world scenario. (1-2)

Combine like terms with integer and rational coefficients and constants. (3-8)

Expand linear expressions by distributing. (9-14)

Extend concepts learned in class to apply them in new contexts. (15)

Solve application problems involving simplifying algebraic expressions. (16-17)

Use higher-order and critical thinking skills. (18-20)

Module 5-2: Add Linear Expressions

- **LAUNCH**
Students will participate in a real-world discussion about using expressions to find total numbers of new species discovered in the rain forest.

- **EXPLORE & DEVELOP**

- **Explore: Add Expressions**
Students will use Web Sketchpad to explore how to add linear expressions.

- **Learn: Add Linear Expressions**
Students will understand what a linear expression is and how to add linear expressions.

- **Example 1: Add Linear Expressions**
Students will add linear expressions with integer coefficients and constants.

- **Example 2: Add Linear Expressions**
Students will add linear expressions with rational coefficients and constants.

- **Apply: Theater**
Students will come up with their own strategy to solve an application problem involving ticket sales and donations.

- **REFLECT & PRACTICE**

- **Exit Ticket**

- Students will write and simplify an expression that represents the total number of species that were discovered over a span of just a few years.*

- **Practice (SE p. 249 – 250)**

- Add linear expressions. (1-12)*

- Extend concepts learned in class to apply them to new contexts. (13)*

- Solve application problems involving adding linear expressions. (14-15)*

- Use higher-order and critical thinking skills. (16-19)*

Module 5-3: Subtract Linear Expressions

- **LAUNCH**

- Students will participate in a real-world discussion about using expressions to determine the difference between two countries' shots on goal in soccer.*

- **EXPLORE & DEVELOP**

- **Learn:** Additive Inverses of Expressions

- Students will understand that when two expressions are additive inverses, their sum is zero.*

- **Example 1:** Find the Additive Inverse of Expressions

- Students will find the additive inverse of linear expressions.*

- **Learn:** Subtract Linear Expressions

- Students will learn how to subtract linear expressions using the additive inverse.*

- **Example 2:** Subtract Linear Expressions

- Students will subtract linear expressions with integer coefficients and constants.*

- **Example 3:** Subtract Linear Expressions

- Students will subtract linear expressions with rational coefficients and constants.*

- **Apply:** Sales

- Students will come up with their own strategy to solve an application problem involving sales of T-shirts.*

- **REFLECT & PRACTICE**

- **Exit Ticket**

- Students will write and simplify an expression that represents how many more shots on goal Japan had than the United States.*

- **Practice (SE p. 257 – 258)**
Find the additive inverse of linear expressions. (1-3)

- Subtract linear expressions. (4-12)*

- Extend concepts learned in class to apply them in new contexts. (13)*

- Solve application problems involving subtracting linear expressions. (14-15)*

- Use higher-order and critical thinking skills. (16-19)*

Module 5-4: Factor Linear Expressions

- **LAUNCH**

Students will participate in a real-world discussion about using an expression to find the cost of a group of friends attending a concert.

- **EXPLORE & DEVELOP**

- **Learn:** Monomials
Students will understand what a monomial is and how to identify one.

- **Learn:** Greatest Common Factor of Monomials
Students will find the greatest common factor of two monomials.
 - **Example 1:** Find the GCF of Monomials
Students will find the greatest common factor of monomials by identifying the GCF of the coefficients and the variables.

 - **Example 2:** Find the GCF of Monomials
Students will find the greatest common factor of monomials using prime factorization.

- **Explore:** Factor Linear Expressions
Students will use algebra tiles to explore how to factor linear expressions.

- **Learn:** Factor Linear Expressions
Students will use the Distributive Property to factor a linear expression.
 - **Example 3:** Factor Linear Expressions
Students will factor linear expressions.

 - **Example 4:** Expressions with No Common Factors
Students will determine that linear expressions with no common factors cannot be factored.

 - **Example 5:** Factor Linear Expressions
Students will factor linear expressions with rational numbers written as fractions.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will rewrite the expression $4x + 8$ using a common factor that represents the total cost and the cost for each friend going to a concert.
- **Practice (SE p. 265 – 266)**
Find the greatest common factor of monomials by identifying the GCF of the coefficients and the variables. (1-6)

Factor linear expressions. (7-15)

Extend concepts learned in class to apply them in new context. (16)

Solve application problems involving factoring linear expressions. (17-18)

Use high-order and critical thinking skills. (19-22)

Module 5-5: Combine Operations with Linear Expressions

- **LAUNCH**
Students will participate in a real-world discussion about using an expression to find the number of leftover decorations from classroom parties.
- **EXPLORE & DEVELOP**
 - **Example 1:** Combine Operations to Simplify Expressions
Students will simplify linear expressions by using the Distributive Property, combining like terms, and writing the answer in factored form.
 - **Example 2:** Combine Operations to Simplify Expressions
Students will simplify expressions with rational numbers by using the Distributive Property and combining like terms.
 - **Example 3:** Combine Operations to Simplify Expressions
Students will simplify linear expressions by using the Distributive Property, adding, or subtracting, and writing the answer in factored form.
- **Apply:** Gardening
Students will come up with their own strategy to solve an application problem involving the area of a flower border of a garden.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will find the simplified expression that represents the number of decorations and streamers that were given to each of the three neighboring classrooms.
 - **Practice (SE p. 271 – 272)**
Simplify linear expressions by using the Distributive Property, combining like terms, and adding or subtracting. (1-12)

Extend concepts learned in class to apply them in new contexts. (13)

Solve application problems involving combining operations with linear expressions. (14-15)

Use higher-order and critical thinking skills. (16-19)

○ **Formative Assessment Math Probe**

Students will determine if each pair of expressions is equivalent by using strategies such as: combining like terms, factoring, and distribution.

Module 5 Review

Module 5 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

Advanced Learners



Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities





Use IXL to enhance targeted skills.

Struggling Learners



Refer to orange **AL** (*Approaching Level*) indicators in Teacher Edition and assign corresponding activities:

- Remediation Activities
- Extra Examples
- *Arrive Math* Take Another Look Mini Lessons

	 <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
<p>Learners with a 504</p>	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections	
<p>Indicators:</p> <p><u>Computer Science and Design Thinking:</u></p> <p>8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.</p> <p>8.1.8.DA.5 Test, analyze, and refine computational models</p>	

Science:

MS-ETS1-3 Analyze data from test to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet criteria for success.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and critical thinking.

Unit Title:

Module 6
Write and Solve Equations

Unit Description:

In this module, students will draw on their knowledge of solving one-step equations (gained in Grade 6) to develop an *understanding* of solving two-step equations and equations with rational numbers. They will use this understanding to gain *fluency* in writing and solving two-step equations. They will *apply* their understanding to solve real-world problems.

Unit Duration: 17 days

Desired Results

Standard(s):

7.NS.A

Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.

7.EE.B

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Indicators:

7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.B.4.A

Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

Understandings:

Students will...

- Write and solve one-step equations with rational numbers.
- Solve two-step equations of the form $px + q = r$.
- Write and solve two-step equations of the form $px + q = r$.
- Solve two-step equations of the form $p(x + q) = r$.
- Write and solve two-step equations of the form $p(x + q) = r$.

Essential Questions:

How can equations be used to solve everyday problems?

How can algebra tiles help you solve one-step equations with integers?

How can you model and solve problems that involve two operations?

How can algebra tiles help you solve equations that involve two operations?

How can a bar diagram help you solve problems involving two-step equations?

How can you model and solve problems that involve two-step equations with parentheses?

How can algebra tiles help you solve two-step equations containing parentheses?

How can a bar diagram help you solve problems involving two-step equations that contain parentheses?

Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 6 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Activities:

Module 6-1: Write and Solve One-Step Equations

- **LAUNCH**

Students will participate in a real-world discussion about Australia's Lake Eyre and using an equation to find the elevation of the deepest part of the lake.

- **EXPLORE & DEVELOP**

- **Explore:** Solve One-Step Equations Using Algebra Tiles

Students will use algebra tiles to explore how to model and solve one-step equations.

- **Learn:** Properties of Equality

Students will learn about the properties of equality.

- **Learn:** Equations

Students will understand that an equation is a sentence stating two quantities are equal, and that equivalent equations have the same solution.

- **Example 1:** Solve One-Step Addition Equations

Students will solve one-step addition equations with integers.

- **Example 2:** Solve One-Step Subtraction Equations

Students will solve one-step subtraction equations with integers.

- **Example 3:** Solve One-Step Multiplication Equations

Students will solve one-step multiplication equations with integers.

- **Example 4:** Solve One-Step Division Equations

Students will solve one-step division equations with integers.

- **Learn:** Multiplicative Inverse

Students will learn about multiplicative inverses and the Inverse Property of Multiplication.

- **Example 5:** Solve Equations with Fractional Coefficients

Students will solve one-step equations with fractional coefficients.

- **Example 6:** Solve Equations with Decimal Coefficients

Students will solve one-step equations with decimal coefficients.

- **Example 7:** Solve Equations with Rational Numbers

Students will solve one-step equations with rational numbers.

- **Learn:** Write One-Step Equations

Students will learn how to model a real-world problem with a one-step equation.

- **Example 8:** Write and Solve One-Step Equations

Students will model and solve a real-world problem involving rational numbers using a

one-step equation.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will solve the equation $x + 6 = -9$ to find the elevation x of the deepest part of the lake and interpret the solution within the context of the problem.

- **Practice (SE p. 287 – 288)**

Solve one-step equations. (1-15)

Write and solve one-step equations with rational numbers. (16)

Extend concepts learned in class to apply them in new contexts. (17)

Solve application problems involving writing and solving one-step equations. (18-19)

Use higher-order and critical thinking skills. (20-23)

Module 6-2: Solve Two-Step Equations: $px + q = r$

- **LAUNCH**

Students will participate in a real-world discussion about using an equation to determine specifics when ordering a balloon bouquet.

- **EXPLORE & DEVELOP**

- **Explore:** Solve Two-Step Equations Using Bar Diagrams

Students will use bar diagrams to explore how to model and solve two-step equations.

- **Explore:** Solve Two-Step Equations with Parentheses Using Algebra Tiles

Students will use algebra tiles to explore how to model and solve two-step equations.

- **Learn:** Two-Step Equations

Students will learn how to solve two-step equations.

- **Example 1:** Solve Two-Step Equations

Students will solve two-step equations of the form $px + q = r$ with integers.

- **Example 2:** Solve Two-Step Equations

Students will solve two-step equations of the form $px - q = r$ with integers.

- **Example 3:** Solve Two-Step Equations

Students will solve two-step equations with rational numbers written as decimals.

- **Example 4:** Solve Two-Step Equations

Students will solve two-step equations with fraction coefficients.

- **Learn:** Two-Step Equations: Arithmetic Method and Algebraic Method
Students will understand how the arithmetic method and algebraic method of solving a two-step equation compare.
- **Apply:** Chemistry
Students will come up with their own strategy to solve an application problem involving the freezing points of different chemicals.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will solve the equation $2x + 3 = 9$ to determine the number of balloons x you can have in an arrangement and interpret the solution within the context of the problem.

- **Practice (SE p. 297 – 298)**
Solve two-step equations of the form $px + q = r$. (1-12)

Extend concepts learned in class to apply them to new contexts. (13)

Solve application problems involving solving two-step equations of the form $px + q = r$. (14-15)

Use higher-order and critical thinking skills. (16-19)

Module 6-3: Write and Solve Two-Step Equations: $px + q = r$

- **LAUNCH**

Students will participate in a real-world discussion about using an equation to determine the specifics of joining the ski club.

- **EXPLORE & DEVELOP**

- **Explore:** Write Two-Step Equations
Students will use bar diagrams to explore how to write two-step equations.
- **Learn:** Write Two-Step Equations
Students will learn how to model a real-world problem with a two-step equation of the form $px + q = r$.
 - **Example 1:** Write and Solve Two-Step Equations
Students will write and solve two-step equations of the form $px + q = r$.
 - **Example 2:** Write and Solve Two-Step Equations
Students will write and solve two-step equations of the form $px + q = r$ with negative coefficients.
- **Apply:** Budgets
Students will come up with their own strategy to solve an application problem involving the

cost to rent a moon bounce.

- **REFLECT & PRACTICE**

- **Exit Ticket**

- Students will find the number of weeks w you will need to save by solving the equation $95.5 + 20w = 270$ and interpret the solution within the context of the problem.

- **Practice (SE p. 305 – 306)**

- Write and solve two-step equations of the form $px + q = r$. (1-4)

- Write and solve two-step equations of the form $px + q = r$ with negative coefficients. (5-7)

- Extend concepts learned in class to apply them in new contexts. (8)

- Solve application problems involving writing and solving two-step equations of the form $px + q = r$. (9-10)

- Use higher-order and critical thinking skills. (11-14)

Module 6-4: Solve Two-Step Equations: $p(x + q) = r$

- **LAUNCH**

- Students will participate in a real-world discussion about using an equation to determine the width of a petting zoo enclosure.

- **EXPLORE & DEVELOP**

- **Explore:** Solve Two-Step Equations Using Bar Diagrams

- Students will use bar diagrams to explore how to model and solve two-step equations with parentheses.

- **Explore:** Solve Two-Step Equations Using Algebra Tiles

- Students will use algebra tiles to explore how to model and solve two-step equations with parentheses.

- **Learn:** Two-Step Equations

- Students will learn how to solve two-step equations of the form $p(x + q) = r$.

- **Example 1:** Solve Two-Step Equations

- Students will solve two-step equations of the form $p(x + q) = r$ with integers.

- **Example 2:** Solve Two-Step Equations

- Students will solve two-step equations of the form $p(x + q) = r$ with integers.

- **Example 3:** Solve Two-Step Equations

- Students will solve two-step equations of the form $p(x + q) = r$ with rational numbers written as decimals.

- **Example 4: Solve Two-Step Equations**

Students will solve two-step equations of the form $p(x + q) = r$ with rational numbers written as fractions.

- **Learn:** Two-Step Equations: Arithmetic Method and Algebraic Method
Students will understand how the arithmetic method and algebraic method of solving a two-step equation with parentheses compare.
- **Apply:** Gardening
Students will come up with their own strategy to solve an application problem involving a border around a garden.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will solve the equation $2(40 + w) = 150$ to find the width w of the rectangular enclosure at a petting zoo and interpret the solution within the context of the problem.

- **Practice (SE p. 315 – 316)**
Solve two-step equations of the form $p(x + q) = r$. (1-12)

Extend concepts learned in class to apply them in new contexts. (13)

Solve application problems involving solving two-step equations of the form $p(x + q) = r$. (14-15)

Use high-order and critical thinking skills. (16-19)

Module 6-5: Write and Solve Two-Step Equations: $p(x + q) = r$

- **LAUNCH**

Students will participate in a real-world discussion about using an equation to find the cost per game of bowling.

- **EXPLORE & DEVELOP**

- **Explore:** Write Two-Step Equations
Students will explore how to write two-step equations with parentheses.
- **Learn:** Write Two-Step Equations
Students will learn how to model a real-world problem with a two-step equation of the form $p(x + q) = r$.
 - **Example 1:** Write and Solve Two-Step Equations
Students will write and solve two-step equations of the form $p(x + q) = r$.
 - **Example 2:** Write and Solve Two-Step Equations
Students will write and solve two-step equations of the form $p(x - q) = r$.

- **Apply: Perimeter**
Students will come up with their own strategy to solve an application problem involving perimeter.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain how to write an equation that can be used to find the cost of a game of bowling and then find the cost of a game.

- **Practice (SE p. 323 – 324)**
Write and solve two-step equations of the form $p(x + q) = r$. (1-7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving writing and solving two-step equations of the form $p(x + q) = r$. (9-10)

Use higher-order and critical thinking skills. (11-14)

- **Formative Assessment Math Probe**
Students will understand the mathematical meaning of words used to describe relationships between quantities in real-life situations, recognize different ways to write algebraic equations that represent the same mathematical relationships and explain their choices.

Module 6 Review

Module 6 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

Advanced Learners






Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities



Use IXL to enhance targeted skills.

<p>Struggling Learners</p>	 <p>Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (<i>IEP</i>) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
<p>Learners with a 504</p>	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections

Indicators:

Science (Grades 6-8)

MS-PS4-1

Use mathematical representations to describe a simple model for waves that include how the amplitude of a wave is related to the energy in a wave.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and critical thinking.

Unit Title:

Module 7 Write and Solve Inequalities

Unit Description:

In this module, students will draw on their knowledge of inequalities (gained in Grade 6) and equations to build an *understanding* of writing, solving, and graphing one- and two-step inequalities. They will use their understanding to build *fluency* in solving and graphing one- and two-step inequalities. They will *apply* their fluency to write, solve and graph one- and two-step inequalities that represent real-world situations.

Unit Duration: 13 days

Desired Results

Standard(s):

7.EE.B

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Indicators:

7.EE.B.4.B

Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

Understandings:

Students will...

- Solve and graph one-step addition and subtraction inequalities.
- Write and solve one-step addition and subtraction inequalities.
- Solve and graph one-step multiplication and division inequalities with positive coefficients.
- Solve and graph one-step multiplication and division inequalities with negative coefficients.
- Write and solve one-step multiplication and division inequalities.
- Write and solve two-step inequalities.

Essential Questions:

How are the solutions to inequalities different from the solutions to equations?

How does adding or subtracting the same number from each side of an inequality affect the inequality?

How does multiplying or dividing each side of an inequality by the same positive number affect the inequality?

How does multiplying and dividing each side of inequality by the same negative number affect the inequality?

Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 7 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 7-1: Solve One-Step Addition and Subtraction Inequalities

- **LAUNCH**

Students will participate in a real-world discussion about inequalities, using an infographic.

- **EXPLORE & DEVELOP**

- **Explore:** Addition and Subtraction Properties of Inequality
Students will use Web Sketchpad to explore how inequalities behave when adding or subtracting the same number from each side.
- **Learn:** Inequalities
Students will understand the definition of inequality and the different meanings of the inequality symbols.
- **Learn:** Graph Inequalities
Students will understand how to graph an inequality on a number line.
- **Learn:** Subtraction and Addition Properties of Inequality
Students will understand Subtraction and Addition Properties of Inequality.
 - **Example 1:** Solve and Graph Addition Inequalities
Students will solve and graph one-step addition inequalities with integers.
 - **Example 2:** Solve and Graph Addition Inequalities
Students will solve and graph one-step addition inequalities with rational numbers.
 - **Example 3:** Solve and Graph Subtraction Inequalities
Students will solve and graph one-step subtraction inequalities with rational numbers.
- **Apply:** Crafting
Students will come up with their own strategy to solve an application problem involving a project with wire and determining how much is left.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will determine phrases in which you might use the $>$ symbol and the $<$ symbol.
- **Practice (SE p. 339 – 340)**
Solve and graph one-step addition and subtraction inequalities. (1-12)

Solve application problems involving solving one-step addition and subtraction inequalities. (13-14)

Use higher-order and critical thinking skills. (15-18)

Module 7-2: Write and Solve One-Step Addition and Subtraction Inequalities

- **LAUNCH**

Students will participate in a real-world discussion about the minimum height requirement to ride bumper boats at an amusement park.

- **EXPLORE & DEVELOP**

- **Learn:** Write Inequalities

Students will understand how to write inequalities from a real-world problem.

- **Example 1:** Write and Solve One-Step Inequalities

Students will write one-step addition inequalities from real-world problems and interpret the solution.

- **Example 2:** Write and Solve One-Step Subtraction Inequalities

Students will write one-step subtraction inequalities from real-world problems and interpret the solution.

- **Apply:** Elevators

Students will come up with their own strategy to solve an application problem involving the weight capacity of an elevator.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine the inequality that can be used to find the number of inches a girl needs to grow so that she is at least 36 inches tall.

- **Practice (SE p. 347 – 348)**

Write and solve one-step addition inequalities from real-world problems and interpret the solution. (1-4)

Write and solve one-step subtraction inequalities from real-world problems and interpret the solution. (5—7)

Extend concepts learned in class to apply them to new contexts. (8)

Solve application problems involving writing and solving one-step addition and subtraction inequalities. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 7-3: Solve One-Step Multiplication and Division Inequalities with Positive Coefficients

- **LAUNCH**

Students will participate in a real-world discussion about buying pizzas for a Spanish Club.

- **EXPLORE & DEVELOP**

- **Explore:** Multiplication and Division Properties of Inequality
Students will explore how multiplying and dividing each side of an inequality by the same positive number affects the inequality.
- **Learn:** Division and Multiplication Properties of Inequalities
Students will understand Division of Multiplication Properties of Inequality when coefficients are positive.
 - **Example 1:** Solve and Graph Multiplication Inequalities
Students will solve and graph one-step multiplication inequalities with positive coefficients.
 - **Example 2:** Solve and Graph Division Inequalities
Students will solve and graph one-step division inequalities with positive coefficients.
- **Apply:** Fashion
Students will come up with their own strategy to solve an application problem involving T-shirt and tie-dye kits.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain how to determine the maximum number of pizzas Miss Zevallos can buy using the inequality $8.5x \leq 35$.
- **Practice (SE p. 355 – 356)**
Solve and graph one-step multiplication and division inequalities with positive coefficients. (1-10)

Solve application problems involving solving one-step multiplication and division inequalities with positive coefficients. (11-12)

Use higher-order and critical thinking skills. (13-16)

Module 7-4: Solve One-Step Multiplication and Division Inequalities with Negative Coefficients

- **LAUNCH**

Students will participate in a real-world discussion about tracking inventory of dog food at a warehouse.

- **EXPLORE & DEVELOP**

- **Explore:** Multiply and Divide Inequalities by Negative Numbers
Students will use Web Sketchpad to explore how multiplying and dividing each side of an inequality by the same negative number affects the inequality.

- **Learn:** Division and Multiplication Properties of Inequality
Students will understand the Division and Multiplication Properties of Inequality when coefficients are negative.
 - **Example 1:** Multiplication Inequalities with Negative Coefficients
Students will solve and graph one-step multiplication inequalities with negative coefficients.
 - **Example 2:** Division Inequalities with Negative Coefficients
Students will solve and graph one-step division inequalities with negative coefficients.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will solve the inequality $-13w < -530$, where w is the number of weeks and interpret the solution within the context of the problem.
- **Practice (SE p. 363 – 364)**
Solve and graph one-step multiplication and division inequalities with negative coefficients. (1-9)

Extend concepts learned in class to apply them in new contexts. (10)

Solve application problems involving solving one-step multiplication and division inequalities with negative coefficients. (11-12)

Use high-order and critical thinking skills. (13-16)
- **Formative Assessment Math Probe**
Students will understand that the Addition Property of Inequality and the Multiplication Property of Inequality can be used to isolate variables and solve algebraic inequalities to determine whether $x > 4$ is a solution to each inequality and explain their choices.

Module 7-5: Write and Solve One-Step Multiplication and Division Inequalities

- **LAUNCH**
Students will participate in a real-world discussion about the flying speeds of peregrine falcons.
- **EXPLORE & DEVELOP**
 - **Example 1:** Write and Solve One-Step Multiplication Inequalities
Students will write one-step multiplication inequalities from real-world problems and interpret the solution.
 - **Example 2:** Write and Solve One-Step Division Inequalities
Students will write one-step division inequalities from real-world problems and interpret the solution.
- **Apply:** Fundraising
Students will come up with their own strategy to solve an application problem involving

fundraising for buses.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will write an inequality that can be used to determine how long it would take a peregrine falcon to travel at most 220 miles.

- **Practice (SE p. 371 – 372)**

Write and solve one-step multiplication inequalities from real-world problems and interpret the solution. (1-4)

Write and solve one-step division inequalities from real-world problems and interpret the solution. (5-7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving writing and solving one-step multiplication and division inequalities. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 7-6: Write and Solve Two-Step Inequalities

- **LAUNCH**

Students will participate in a real-world discussion about renting bicycles to travel around Mackinac Island in Michigan.

- **EXPLORE & DEVELOP**

- **Learn: Solve Two-Step Inequalities**

Students will understand how to solve two-step inequalities.

- **Example 1: Solve Two-Step Inequalities**

Students will solve and graph two-step inequalities involving integers.

- **Example 2: Solve Two-Step Inequalities**

Students will solve and graph two-step inequalities involving decimals.

- **Example 3: Solve Two-Step Inequalities**

Students will solve and graph two-step inequalities involving fractions.

- **Example 4: Write and Solve Two-Step Inequalities**

Students will write two-step inequalities from real-world problems and interpret the solution.

- **Example 5: Write and Solve Two-Step Inequalities**

Students will write two-step inequalities with negative coefficients from real-world problems and interpret the solution.

- **Apply: School**
Students will come up with their own strategy to solve an application problem involving the average score needed in a class.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will write and solve an inequality that can be used to determine the number of hours for which they can rent the bikes and interpret the solution within the context of the problem.
- **Practice (SE p. 383 – 384)**
Solve and graph two-step inequalities with rational numbers. (1-6)

Write and solve two-step inequalities from real-world problems and interpret the solution. (7-8)

Write and solve two-step inequalities with negative coefficients from real-world problems and interpret the solution. (9)

Extend concepts learned in class to apply them in new contexts. (10)

Solve application problems involving writing and solving two-step inequalities. (11-12)

Use higher-order and critical thinking skills. (13-16)

Module 7 Review

Module 7 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

Advanced Learners






Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities



Use IXL to enhance targeted skills.

<p>Struggling Learners</p>	 <p>Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (<i>IEP</i>) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
<p>Learners with a 504</p>	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections

Indicators:

Social Studies:

6.1.12.EconNE.3.a Analyze the impact of money, investment, credit, savings, debt, and financial institutions on the development of the nation and the lives of individuals.

Computer Science and Design Thinking:

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

Technology Education:

9.3.ST-ET.5 Apply the knowledge learned in STEM to solve problems.

9.4.12.O.11 Apply active listening skills to obtain and clarify information.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and critical thinking.

Unit Title:

Module 8 Geometric Figures

Unit Description:

In this module, students will draw on their knowledge of lines and angles, equivalent ratios, and three-dimensional figures to gain *understanding* of angles, triangles, and scale drawings. They will use this understanding to develop *fluency* with vertical, adjacent, complementary, and supplementary angles, classifying and drawing triangles, scale drawings and three-dimensional figures. They will *apply* their fluency to solve real-world problems.

Unit Duration: 12.5 days

Desired Results

Standard(s):

7.G.A

Draw, construct and describe geometrical figures and describe the relationship between them.

7.G.B

Solve real-life and mathematical problems involving angle measure, area, surface area and volume.

Also addresses...

7.EE.B

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

7.RP.A

Analyze proportional relationships and use them to solve real-world and mathematical problems.

7.NS.A

Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.

Indicators:

7.G.A.1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing, and reproducing a scale drawing at a different scale.

7.G.A.2

Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

7.G.B.5

Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

Also addresses...

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.

7.EE.B.4.A

Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

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.3

Use proportional relationships to solve multi-step ratio and percent problems.

7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.

Understandings:

Students will...

- Identify vertical and adjacent angles and use what they know to find missing values.
- Identify complementary and supplementary angles and use what they know to find missing values.
- Draw triangles with and without tools.
- Solve problems involving scale drawings.
- Analyze three-dimensional figures.

Essential Questions:

How does geometry help to describe objects?

What are some relationships between pairs of angles created by two intersecting lines?

What does it mean for angle pairs to be complementary or supplementary?

How do you know whether or not it is possible to create a triangle given any three side lengths or any three angle measures?

How can I use the scale to create a scale drawing?

Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 8 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 8-1: Vertical and Adjacent Angles

- **LAUNCH**

Students will participate in a real-world discussion about engineers using different combinations of vertical and adjacent angles to ensure the safety of roller coasters.

- **EXPLORE & DEVELOP**

- **Learn:** Angles

Students will understand how to classify angles by their measures.

- **Learn:** Name Angles

Students will understand the different ways in which to name angles.

- **Example 1:** Name Angles

Students will name angles using different notations.

- **Explore:** Vertical and Adjacent Angle Pairs

Students will use Web Sketchpad to explore attributes of vertical and adjacent angle pairs.

- **Learn:** Identify Vertical Angles

Students will understand the relationship between vertical angles.

- **Example 2:** Identify Vertical Angles

Students will identify vertical angle pairs.

- **Learn:** Use Vertical Angles to Find Missing Values

Students will understand how to use the properties of vertical angles to find missing values.

- **Example 3:** Use Vertical Angles to Find Missing Values

Students will use the properties of vertical angles to find missing values.

- **Learn:** Identify Adjacent Angles

Students will understand the relationship between adjacent angles.

- **Example 4:** Identify Adjacent Angles

Students will identify adjacent angle pairs.

- **Learn:** Use Adjacent Angles to Find Missing Values

Students will understand how to use the properties of adjacent angles to find missing values.

- **Example 4:** Use Adjacent Angles to Find Missing Values

Students will use the properties of adjacent angles to find missing values.

- **Apply:** Art

Students will come up with their own strategy to solve an application problem involving vertical and adjacent angles.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will explain the difference between vertical angles and adjacent angles.

- **Practice (SE p. 401 – 402)**

Name angles. (1-2)

Identify vertical and adjacent angle pairs. (3-4)

Use vertical angles to find missing values. (5-6)

Use adjacent angles to find missing values. (7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving adjacent angles. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 8-2: Complementary and Supplementary Angles

- **LAUNCH**

Students will participate in a real-world discussion about different angle measures used in the construction of a bridge, affecting the load that a bridge can support.

- **EXPLORE & DEVELOP**

- **Explore:** Complementary and Supplementary Angle Pairs

Students will use Web Sketchpad to explore the properties of complementary and supplementary angle pairs.

- **Learn:** Identify Complementary Angles

Students will understand the properties of complementary angles.

- **Example 1:** Identify Complementary Angles

Students will identify complementary angle pairs.

- **Learn:** Use Complementary Angles to Find Missing Values

Students will understand how to use the properties of complementary angles to find missing values.

- **Example 2:** Use Complementary Angles to Find Missing Values

Students will use the properties of complementary angles to find missing values.

- **Learn:** Identify Supplementary Angles

Students will understand the properties of complementary angles.

- **Example 3:** Identify Supplementary Angles
Students will identify supplementary angle pairs.
 - **Learn:** Use Supplementary Angles to Find Missing Values
Students will understand how to use the properties of supplementary angles to find missing values.
 - **Example 4:** Use Supplementary Angles to Find Missing Values
Students will use the properties of supplementary angles to find missing values.
 - **Apply:** Engineering
Students will come up with their own strategy to solve an application problem involving the engineering of a space shuttle scaffold.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will determine what the measure of the other angle is if a straight angle on the truss of the bridge is formed by two angles, one of which is 45° .
 - **Practice (SE p. 411 – 412)**
Identify the complement of angles. (1-3)

Identify the supplementary angles. (4-6)

Use complementary and supplementary angles to find missing values. (7-12)

Solve application problems involving complementary and supplementary angles. (13-14)

Use higher-order and critical thinking skills. (15-18)
 - **Formative Assessment Math Probe**
Students will understand the terms complementary, supplementary, vertical, congruent, and adjacent and use reasoning about angles to analyze relationships and classify pairs of angles.

Module 8-3: Triangles

- **LAUNCH**
Students will participate in a real-world discussion about the use of triangular sails on sailboats.
- **EXPLORE & DEVELOP**
 - **Explore:** Create Triangles
Students will use Web Sketchpad to explore the relationships among the side lengths or angle measures in a triangle.

- **Learn:** Classify Triangles
Students will understand how to classify triangles by angle measures and by side lengths.
- **Learn:** Draw Triangles Freehand
Students will understand how to draw triangles without tools.
 - **Example 1:** Draw Triangles Freehand
Students will draw triangles without tools, classify the triangles by their sides and angles, and determine if the triangles are unique.
- **Learn:** Draw Triangles Using Tools
Students will understand how to draw triangles using a ruler and protractor.
 - **Example 2:** Draw Triangles Using Tools
Students will draw triangles (given three angles) using a ruler and protractor.
 - **Example 3:** Draw Triangles using Tools
Students will draw triangles (given two angles and the length of the included side) using a ruler and protractor.
- **Learn:** Draw Triangles with Technology
Students will understand how to draw triangles using technology.
 - **Example 4:** Draw Triangles with Technology
Students will draw triangles (given three sides) using technology.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will determine if you have all the information you need to buy the correct size sail given the side lengths of 7 feet and 24 feet, with a 90° angle between them.
- **Practice (SE p. 421 – 422)**
Draw triangles without tools, classify the triangle by its sides and angles and determine if it has the given characteristics. (1-2)

Draw triangles using a ruler and protractor. (3-6)

Draw triangles using technology. (7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving triangles. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 8-4: Scale Drawings

- **LAUNCH**

Students will participate in a real-world discussion about blueprints as examples of scale drawings.

- **EXPLORE & DEVELOP**

- **Learn:** Use Scale Drawings to Find Length

Students will understand how to use scale drawings and the scale to find actual length.

- **Example 1:** Use Scale Drawings to Find Length

Students will use the scale of a scale drawing to find actual length.

- **Learn:** Create Scale Drawings

Students will understand how to make a scale drawing.

- **Learn:** Use Scale Drawings to Find Area

Students will understand how to use scale drawings to find area.

- **Example 2:** Use Scale Drawings to Find Area

Students will use scale drawings to find area.

- **Explore:** Scale Drawings

Students will use Web Sketchpad to explore reproducing scale drawings using different scales.

- **Learn:** Reproduce Scale Drawings

Students will understand how to reproduce a scale drawing at a different scale.

- **Example 3:** Reproduce Scale Drawings

Students will reproduce a scale drawing at a different scale.

- **Apply:** Construction

Students will come up with their own strategy to solve an application problem involving the cost to install flooring.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine how tall a building represented in a blueprint is.

- **Practice (SE p. 433 – 434)**

Use the scale of a map to find the actual length. (1-2)

Use scale drawings to find area. (3-4)

Reproduce scale drawings at different sizes. (5)

Extend concepts learned in class to apply them in new contexts. (6)

Solve application problems involving scale drawings. (7-8)

Use high-order and critical thinking skills. (9-12)

Module 8-5: Three-Dimensional Figures

- **LAUNCH**

Students will participate in a real-world discussion about the pyramid-shaped entrance to the Rock and Roll Hall of Fame in Cleveland, Ohio.

- **EXPLORE & DEVELOP**

- **Learn:** Describe Three-Dimensional Figures

Students will understand the attributes of polyhedron and non-polyhedron.

- **Example 1:** Describe Three-Dimensional Figures

Students will use the number of faces, edges, and vertices to describe three dimensional figures.

- **Learn:** Describe Cross Sections of Three-Dimensional Figures

Students will understand horizontal, vertical, and angled cross sections of three-dimensional figures.

- **Example 2:** Describe Cross Sections of Three-Dimensional Figures

Students will describe the shape resulting from vertical, horizontal, and angled cross sections of pyramids and cones.

- **Example 3:** Describe Cross Sections of Three-Dimensional Figures

Students will describe the shape resulting from vertical, horizontal, and angled cross sections of prisms and cylinders.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine the shape of a horizontal cross section.

- **Practice (SE p. 439 – 440)**

Use the number of faces, edges, and vertices to describe three dimensional figures. (1-2)

Describe the shape resulting from vertical, horizontal, and angled cross sections of three-dimensional figures. (3-5)

Extend concepts learned in class to apply them in new contexts. (6)

Solve application problems involving three-dimensional figures. (7-8)

Use higher-order and critical thinking skills. (9-12)

Module 8 Review

Module 8 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

Advanced Learners



Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities





Use IXL to enhance targeted skills.

Struggling Learners



Refer to orange **AL** (*Approaching Level*) indicators in Teacher Edition and assign corresponding activities:

- Remediation Activities
- Extra Examples
- *Arrive Math* Take Another Look Mini Lessons

	 <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
<p>Learners with a 504</p>	<p>Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.</p>

Interdisciplinary Connections	
<p>Indicators:</p> <p><u>Social Studies (Grades 6-8)</u></p> <p>6.1.8.GeoSV.4.a <i>Map territorial expansion and settlement, highlighting the locations of conflicts with and resettlement of Native Americans.</i></p>	

Science (Grades 6-8)

MS-ESS1-3

Analyze and interpret data to determine scale properties of objects in the solar system.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and creativity.

Unit Title:

**Module 9
Measure Figures**

Unit Description:

In this module, students will develop an *understanding* of radius and diameter, and how they relate to finding the circumference and area of circles. They will also draw on their knowledge of finding the area of triangles and quadrilaterals to gain *fluency* in finding the area of composite figures, volume, and surface area. They will use this knowledge to gain fluency in finding the volume and surface area of composite three-dimensional figures. They will also *apply* their fluency to solve real-world problems.

Unit Duration: 14 days

Desired Results

Standard(s):

7.G.B

Solve real-life and mathematical problems involving angle measure, area, surface area and volume.

Indicators:

7.G.B.4

Know the formulas for the area and circumference of a circle and use them to solve problems; given an informal derivation of the relationship between the circumference and area of a circle.

7.G.B.6

Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Understandings:

Students will...

- Use radius and diameter to find circumference.
- Find the area of circles.
- Find the area of composite figures.
- Find the volume of prisms and pyramids.
- Find the surface area of prisms and pyramids.
- Find the volume and surface area of composite figures.

Essential Questions:

- How can we measure objects to solve problems?*
- How does the distance around a circle relate to its diameter?*
- How can you use the formula for the area of a parallelogram to help you find the area of a circle?*
- How does the base area of a prism affect the volume of a prism?*
- What is the relationship between the volume of a prism and the volume of a pyramid with the same base and height?*
- How can you find the surface area of prisms and pyramids without using nets?*

Assessment Evidence

Performance Tasks:

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 9 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 9-1: Circumference of Circles

- **LAUNCH**

Students will participate in a real-world discussion about pi using an infographic.

- **EXPLORE & DEVELOP**

- **Learn:** Radius and Diameter

Students will understand the relationship between the radius and diameter of a circle.

- **Explore:** The Distance Around a Circle

Students will use Web Sketchpad to explore the relationship between the diameter of a circle and the distance around the same circle.

- **Learn:** Circumference of Circles

Students will understand that the distance around a circle is called its circumference, and how the circumference is related to the circle's diameter and radius.

- **Example 1:** Find the Circumference Given the Diameter

Students will find the circumference of a circle given the diameter.

- **Example 2:** Find the Circumference Given the Radius

Students will find the circumference of a circle given the radius.

- **Learn:** Use Circumference to Find Missing Dimensions

Students will understand how the circumference formula can be applied to find the diameter or radius of a circle.

- **Example 3:** Find the Diameter Given the Circumference

Students will find the diameter of a circle given the circumference.

- **Example 4:** Find the Radius Given the Circumference

Students will find the radius of a circle given the circumference.

- **Apply:** Gardening

Students will come up with their own strategy to solve an application problem involving a circular garden.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine the amount of rope used in the construction of a model of the five Olympic rings.

- **Practice (SE p. 455 – 456)**

Find the circumference of a circle given the diameter. (1-2)

Find the circumference of a circle given the radius. (3-4)

Find the diameter of a circle given the circumference. (5-6)

Find the radius of a circle given the circumference. (7-8)

Solve application problems involving circumference of circles. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 9-2: Area of Circles

- **LAUNCH**

Students will participate in a real-world discussion about the use of longe lines when training a horse in a circular enclosure.

- **EXPLORE & DEVELOP**

- **Explore:** Area of Circles

Students will use Web Sketchpad to explore the formula for the area of a circle.

- **Learn:** Derive the Formula for the Area of a Circle

Students will understand how to derive the formula for the area of a circle from the area of a parallelogram.

- **Learn:** Area of Circles

Students will understand how to find the area of a circle.

- **Example 1:** Find the Area Given the Radius

Students will find the area of a circle given the radius.

- **Example 2:** Find the Area Given the Diameter

Students will find the area of a circle given the diameter.

- **Learn:** Area of Semicircles

Students will understand how the area of a semicircle is related to the area of a circle, with the same radius, and how that relationship can be expressed in a formula.

- **Example 3:** Find Area of Semicircles

Students will find the area of a semicircle.

- **Learn:** Use Circumference to Find Area

Students will understand how they can apply the formula for the circumference of a circle to find the circle's area, given the circumference.

- **Example 4:** Use Circumference to Find Area

Students will find the area of a circle given the circumference of the circle.

- **Apply:** Crafting

Students will come up with their own strategy to solve an application problem involving a square scrapbook page.

- **REFLECT & PRACTICE**

- **Exit Ticket**

- Students will determine why the amount of area a horse can roam, while attached to the 30-foot-long-longe line, is about 2,826 square feet.*

- **Practice (SE p. 465 – 466)**

- Find the area of a circle given the radius. (1-2)*

- Find the area of a circle given the diameter. (3-4)*

- Find the area of a semicircle. (5-6)*

- Find the area of a circle given the circumference of the circle. (7)*

- Extend concepts learned in class to apply them to new contexts. (8)*

- Solve application problems involving areas of circles. (9-10)*

- Use higher-order and critical thinking skills. (11-14)*

Module 9-3: Area of Composite Figures

- **LAUNCH**

- Students will participate in a real-world discussion about the state flag of Ohio as an example of a composite figure.*

- **EXPLORE & DEVELOP**

- **Learn:** Area of Composite Figures

- Students will understand how to decompose a composite figure into known shapes in order to find the area.*

- **Example 1:** Area of Composite Figures

- Students will find the area of composite figures.*

- **Learn:** Area of Shaded Regions

- Students will understand how to find the area of shaded regions.*

- **Example 2:** Area of Shaded Regions

- Students will find the area of shaded regions.*

- **Apply:** Art

- Students will come up with their own strategy to solve an application problem involving the creation of a mosaic.*

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will describe one way that a flag can be decomposed into smaller shapes to find its area.
- **Practice (SE p. 473 – 474)**
Find the area of composite figures. (1-6)

Find the area of shaded regions. (7)

Extend concepts learned in class to apply them in new contexts. (8)

Solve application problems involving area of composite figures. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 9-4: Volume

- **LAUNCH**
Students will participate in a real-world discussion about the volume of various popcorn tins in the shape of rectangular prisms.
- **EXPLORE & DEVELOP**
 - **Explore:** Volume of Prisms
Students will explore the relationship between the area of the base and the volume of a prism.
 - **Learn:** Volume of Prisms
Students will understand how to find the volume of a prism.
 - **Example 1:** Volume of Rectangular Prisms
Students will find the volume of a rectangular prism.
 - **Example 2:** Volume of Triangular Prisms
Students will find the volume of a triangular prism.
 - **Explore:** Volume of Pyramids
Students will explore the relationship between the volume of a prism and the volume of a pyramid that have the same base area and height.
 - **Learn:** Volume of Pyramids
Students will understand how to find the volume of a pyramid.
 - **Example 3:** Volume of Pyramids
Students will find the volume of a pyramid.
 - **Learn:** Use Volume to Find Missing Dimensions
Students will understand how they can apply the volume formulas to find a missing dimension, given the volume and the other dimensions.

- **Example 4:** Use Volume to Find Missing Dimensions
Students will find the area of the base of a prism given the volume.
- **Example 5:** Use Volume to Find Missing Dimensions
Students will find the height of a pyramid given the volume.
- **Apply:** Packaging
Students will come up with their own strategy to solve an application problem involving packaging a candle properly.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will determine which popcorn tin offers the better deal.
- **Practice (SE p. 485 – 486)**
Find the volume of a rectangular prism. (1-2)

Find the volume of pyramids and triangular prisms. (3-6)

Find the area of the base or the height of a prism given the volume. (7, 10)

Find the area of the base or the height of a pyramid given the volume. (8-9)

Solve application problems involving volume. (11-12)

Use high-order and critical thinking skills. (13-16)
- **Formative Assessment Math Probe**
Students will understand what information is necessary and sufficient to determine the volume of a figure and accurately identify the information in a figure and determine the correct volume of each three-dimensional figure and explain their choices.

Module 9-5: Surface Area

- **LAUNCH**
Students will participate in a real-world discussion about buying paint to redecorate a room.
- **EXPLORE & DEVELOP**
 - **Explore:** Surface Area of Prisms and Pyramids
Students will explore the relationship between nets and surface area.
 - **Learn:** Surface Area of Prisms
Students will understand the relationship between using a net and a formula for finding the surface area of a rectangular prism.

- **Example 1:** Surface Area of Rectangular Prisms
Students will find the surface area of rectangular prisms.
- **Example 2:** Surface Area of Triangular Prisms
Students will find the surface area of triangular prisms.
- **Learn:** Surface Area of Pyramids
Students will understand the structure of a pyramid and how to find its surface area.
 - **Example 3:** Surface Area of Pyramids
Students will find the surface area of pyramids.
- **Apply:** Painting
Students will come up with their own strategy to solve an application problem involving painting a toy box.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will determine how many gallons of paint is needed to cover the walls with two coats of paint.
 - **Practice (SE p. 495 – 496)**
Find the surface area of rectangular prisms. (1-2)

Find the surface area of triangular prisms. (3-4)

Find the surface area of pyramids. (5-6)

Solve application problems involving surface area. (7-8)

Solve application problems involving surface area. (7-8)

Use higher-order and critical thinking skills. (9-12)

Module 9-6: Volume and Surface Area of Composite Figures

- **LAUNCH**
Students will participate in a real-world discussion about determining the amount of wood needed to build bat houses.
- **EXPLORE & DEVELOP**
 - **Learn:** Volume of Composite Figures
Students will understand that the volume of a composite figure can be found by first decomposing it into known figures.

- **Example 1:** Volume of Composite Figures
Students will find the volume of three-dimensional composite figures.

- **Learn:** Surface Area of Composite Figures
Students will learn how to find the surface area of three-dimensional composite figures.

- **Example 2:** Surface Area of Composite Figures
Students will find the surface area of three-dimensional composite figures.

- **Apply:** Construction
Students will come up with their own strategy to solve an application problem involving creating a scale model of a home.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students draw a bat house and label its dimensions, enough to find the volume and surface area of the bat house. Students will then exchange papers with a classmate and find the volume and surface area of each other's bat houses.

- **Practice (SE p. 503 – 504)**
Find the volume of three-dimensional composite figures. (1-4)

Find the surface area of three-dimensional composite figures. (5)

Extend concepts learned in class to apply them in new contexts. (6)

Solve application problems involving volume and surface area of composite figures. (7-8)

Use higher-order and critical thinking skills. (9-12)

Module 9 Review

Module 9 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators





Unit Modifications for Special Population Students

Advanced Learners



Refer to green **BL** (*Beyond Level*) indicators in Teacher Edition and assign corresponding activities:

- Beyond Level Differentiated Activities
- Extension Activities

	 <p>Use IXL to enhance targeted skills.</p>
<p>Struggling Learners</p>	 <p>Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (<i>IEP</i>) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product

Learners with a 504

Refer to page four in the [Parent and Educator Resource Guide to Section 504](#) to assist in the development of appropriate plans.

Interdisciplinary Connections**Indicators:****Computer Science and Design Thinking:**

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

Technology Education:

9.3.ST.1 Use technology to acquire, manipulate, analyze, and report data.

9.4.12.O.11 Apply active listening skills to obtain and clarify information.

English Language Arts:

W.6.1.B Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.

Science:

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Integration of 21st Century Skills**Indicators:**

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration, communication, and creativity.

Unit Title:**Module 10
Probability****Unit Description:**

In this module, students will develop an *understanding* of probability of simple and compound events. They will use this understanding to develop *fluency* in finding likelihoods, relative frequencies and determining the

sample space for compound events. They will also compare probabilities, design simulations, and *apply* their understanding of probability to solve real-world problems.

Unit Duration: 15 days

Desired Results

Standard(s):

7.SP.C

Investigate chance processes and develop, use, and evaluate probability models.

Indicators:

7.SP.C.5

Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

7.SP.C.6

Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency and predict the approximate relative frequency given the probability.

7.SP.C.7

Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of discrepancy.

7.SP.C.8

Find probabilities of compound events using organized lists, tables, tree diagrams and simulation.

Understandings:

Students will...

- Solve problems that classify the likelihood of simple events.
- Find the relative frequency of simple events and compare relative frequency to experimental probability.
- Solve problems involving theoretical probability of simple events and their complements.
- Solve problems that compare probabilities and relative frequencies of simple events.

Essential Questions:

How can probability be used to predict future events?

How can words be used to describe the chance of an event happening?

How does running an experiment help you find the likelihood of an event occurring?

How can you predict relative frequency without performing an experiment?

How can you use a table or organized list to represent all possible outcomes from repeated simple events?

How can you use a random number generator to model a probability experiment?

<ul style="list-style-type: none"> • Solve problems involving the probability of compound events. • Solve problems by simulating compound probability events. 	
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Assessment Evidence

<p>Performance Tasks:</p> <ul style="list-style-type: none"> • Warm-ups • Exit Tickets • Reveal Practice Assignments • Formative Assessment Math Probe • GoFormative Assignments 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Independent Work • Class Discussions • Online Activities • Practice • Homework
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Benchmarks:
 Departmental assessment for Module 10 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:

Module 10-1: Find Likelihoods

- **LAUNCH**
Students will participate in a real-world discussion about the likelihood of winning a coin toss at the beginning of a football game.

- **EXPLORE & DEVELOP**
 - **Explore:** Chance Events
Students will use Web Sketchpad to explore how to describe the likelihood of events.

 - **Learn:** Likelihood of Events
Students will understand how to describe the likelihood of events using precise vocabulary.
 - **Example 1:** Classify Likelihoods
Students will classify the likelihood of simple events.

- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will classify an event as impossible, unlikely, equally likely, likely, or certain.

 - **Practice (SE p. 513 – 514)**
Classify the likelihood of simple events. (1-6)

Extend concepts learned in class to apply them in new contexts. (7-8)

Solve application problems involving finding likelihood. (9-10)

Use higher-order and critical thinking skills. (11-14)

Module 10-2: Relative Frequency of Simple Events

- **LAUNCH**
Students will participate in a real-world discussion about expected free throw shots made by basketball players.

- **EXPLORE & DEVELOP**
 - **Explore:** Experiments and Likelihood
Students will use Web Sketchpad to explore how running an experiment helps to classify the likelihood of an event.

 - **Learn:** Relative Frequency
Students will understand what relative frequency means and how to find the relative frequency of an event.

- **Example 1:** Find Relative Frequencies
Students will find relative frequencies from a verbal situation.
- **Example 2:** Find Relative Frequencies from Tables
Students will find relative frequencies from data in frequency tables.
- **Example 3:** Find Relative Frequencies from Graphs
Students will find relative frequencies from frequency bar graphs.
- **Learn:** Relative Frequency Tables and Bar Graphs
Students will understand how to create relative frequency tables and bar graphs from a set of data.
- **Learn:** Experimental Probability from Relative Frequency
Students will understand how experimental probability is related to relative frequency.
 - **Example 4:** Find Experimental Probabilities
Students will find the experimental probability of an event from a relative frequency bar graph.
 - **Example 5:** Estimate to Make Predictions
Students will make predictions using relative frequency and proportional reasoning.
- **Apply:** Sales
Students will come up with their own strategy to solve an application problem involving DVD sales.
- **REFLECT & PRACTICE**
 - **Exit Ticket**
Students will find the number of free throws you would expect a basketball player to make, out of 300 attempts.
 - **Practice (SE p. 527 – 528)**
Find relative frequencies from word problems. (1)

Find relative frequencies from data in frequency table. (2)

Find relative frequencies from frequency bar graphs. (3)

Find the experimental probability of an event from a relative frequency bar graph. (4)

Extend concepts learned in class to apply them to new contexts. (5)

Solve application problems involving relative frequency of simple events. (6-7)

Use higher-order and critical thinking skills. (8-11)

Module 10-3: Theoretical Probability of Simple Events

- **LAUNCH**

Students will participate in a real-world discussion about games of skill and chance at a carnival.

- **EXPLORE & DEVELOP**

- **Explore:** Long-Run Relative Frequencies

Students will use Web Sketchpad to explore the relationship between long-run relative frequency and theoretical probability.

- **Learn:** Sample Space of Simple Events

Students will understand how to find the sample space of simple events.

- **Example 1:** Find Sample Space of Simple Events

Students will find the sample space of simple events.

- **Learn:** Theoretical Probability of Simple Events

Students understand how to find the theoretical probability of simple events.

- **Example 2:** Find Theoretical Probabilities of Simple Events

Students will find the theoretical probability of simple events.

- **Learn:** Complements of Simple Events

Students will understand how to find the complements of simple events.

- **Example 3:** Find Complements of Simple Events

Students will find complements of simple events.

- **Apply:** Probability

Students will come up with their own strategy to solve an application problem involving probability.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will explain how to find the chance of winning on a spinner.

- **Practice (SE p. 537 – 538)**

Find the sample space of simple events. (1-2)

Find the theoretical probability of simple events. (3-4)

Find complements of simple events. (5-6)

Extend concepts learned in class to apply them in new contexts. (7)

Solve application problems involving theoretical probability of simple events. (8-9)

Use higher-order and critical thinking skills. (10-13)

Module 10-4: Compare Probabilities of Simple Events

- **LAUNCH**

Students will participate in a real-world discussion about words used to describe the likelihood of an event.

- **EXPLORE & DEVELOP**

- **Learn:** Compare Relative Frequency to Theoretical Probability

Students will understand how to compare relative frequency to theoretical probability.

- **Example 1:** Compare Relative Frequencies to Probabilities

Students will compare relative frequency to the theoretical probability of a simple event.

- **Apply:** Experiments

Students will come up with their own strategy to solve an application problem involving probability experiments.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will explain when the relative frequency of an experiment might be different from its theoretical probability and explain when the relative frequency of an experiment might be close to its theoretical probability.

- **Practice (SE p. 545 – 546)**

Compare relative frequency to the theoretical probability of a simple event. (1)

Extend concepts learned in class to apply them in new contexts. (2)

Solve application problems involving comparing relative frequency to theoretical probability of simple events. (3)

Use high-order and critical thinking skills. (4-7)

Module 10-5: Probability of Compound Events

- **LAUNCH**

Students will participate in a real-world discussion about possible outcomes of a multiple-choice quiz.

- **EXPLORE & DEVELOP**

- **Explore:** Sample Space of Repeated Simple Events

Students will use Web Sketchpad to explore how to find the sample space of repeated simple events.

- **Learn:** Sample Space of Compound Events
Students will understand how to find the sample space of compound events.
 - **Example 1:** Find Sample Space of Compound Events
Students will find the sample space of compound events using a table or a tree diagram.
 - **Example 2:** Find Sample Space of Compound Events
Students will find the sample space of compound events using an organized list or a tree diagram.
- **Learn:** Theoretical Probability of Compound Event
Students will understand how to find the theoretical probability of compound events.
 - **Example 3:** Find Probabilities of Compound Events
Students will find the theoretical probability of compound events using a table or list.
 - **Example 4:** Find Probabilities of Compound Events
Students will find the theoretical probability of compound events using a tree diagram.
- **Apply:** Outcomes
Students will come up with their own strategy to solve an application problem involving the outcomes of rolling two number cubes.

- **REFLECT & PRACTICE**

- **Exit Ticket**
Students will explain how to find the probability of guessing the correct answer to both questions on two multiple-choice questions with answer choices: A, B, C, D and E.
- **Practice (SE p. 557 – 558)**
Find the sample space of compound events using a table or list. (1)

Find the sample space of compound events using a tree diagram. (2)

Find the theoretical probability of compound events using a table or list. (3)

Find the theoretical probability of compound events. (4-5)

Solve application problems involving probability of compound events. (6-7)

Use higher-order and critical thinking skills. (8-11)
- **Formative Assessment Math Probe**
Students will understand the relationship between theoretical and experimental probability and determine probability by noticing the number of possible occurrences of the wanted outcome divided by the number of all possible outcomes and state whether they agree with each prediction and explain their answer.

Module 10-6: Simulate Chance Events

- **LAUNCH**

Students will participate in a real-world discussion about possible ways to run a simulation of an event.

- **EXPLORE & DEVELOP**

- **Explore:** Simulations

Students will use Web Sketchpad to explore simulating events.

- **Learn:** Simulate Simple Events

Students will understand how to simulate simple events.

- **Learn:** Simulate Compound Events

Students will learn about simulating compound events.

- **Example 1:** Simulate Compound Events

Students will design a simulation of a compound event and analyze the results.

- **Example 2:** Interpret Simulations of Compound Events

Students will interpret a relative frequency bar graph that shows the results of a simulated compound event.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will give an example where a coin can be used to simulate the probability of an event occurring and explain how to design and interpret the simulation.

- **Practice (SE p. 567 – 568)**

Design a simulation of a compound event and analyze the results. (1)

Interpret a relative frequency bar graph that shows the results of a simulated compound event. (2)

Extend concepts learned in class to apply them in new contexts. (3-4)

Use higher-order and critical thinking skills. (5-8)






Module 10 Review

Module 10 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

<p>Advanced Learners</p>	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"></div> <p>Refer to green BL (<i>Beyond Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Beyond Level Differentiated Activities • Extension Activities </div> <div style="display: flex; align-items: flex-start; margin-top: 10px;"> <div style="margin-right: 10px;"></div> <p>Use IXL to enhance targeted skills.</p> </div>
<p>Struggling Learners</p>	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"></div> <p>Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons </div> <div style="display: flex; align-items: flex-start; margin-top: 10px;"> <div style="margin-right: 10px;"></div> <p>Use IXL to enhance targeted skills.</p> </div>
<p>English Language Learners</p>	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"></div> <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools </div>
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing

	<ul style="list-style-type: none"> • Variation of Input: adapting the way instruction is delivered • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

Health and Physical Education (Grades 6-8)

2.2.8.PF.4

Implement and assess the effectiveness of a fitness plan based on health data, the assessment of one's personal fitness levels and monitor healthy/fitness indicators before, during and after the workout program.

Social Studies (Grades 6-8)

6.1.8.CivicsPI.3.d

Use data and other evidence to determine the extent to which demographics influenced the debate on representation in Congress and federalism by examining the New Jersey and Virginia plans.

Science (Grades 6-8)

MS-LS1-4

Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS-ESS2-5

Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration and communication.

Unit Title:

Module 11

Sampling and Statistics

Unit Description:

In this module, students will draw upon their knowledge of measures of center, measures of variation, and ratios from Grade 6 to develop *understanding* about statistical sampling and making inferences and predictions. Students come to *understand* that taking multiple samples can help them gauge the variation in their predictions. Students build *fluency* in using ratio reasoning to make predictions about a population and in using the measures of center and variation to compare two sample distributions. They *apply* their *understanding* of the mean and mean absolute deviation to informally assess the degree of visual overlap between two distributions to infer how close the population means might be.

Unit Duration: 11.5 days

Desired Results

Standard(s):**7.SP.A**

Use random sampling to draw inferences about a population.

7.SP.B

Draw informal comparative inferences about two populations.

7.RP.A

Analyze proportional relationships and use them to solve real-world and mathematical problems.

Indicators:**7.SP.A.1**

Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.A.2

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

7.SP.B.3

Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.

7.SP.B.4

Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

7.RP.A.2

Recognize and represent proportional relationships between quantities.

7.RP.A.3

Use proportional relationships to solve multistep ratio and percent problems.

Understandings:

Students will...

- Identify samples as biased or unbiased and determine whether inferences from the samples are valid.
- Make predictions based on data gathered using a valid sampling method.
- Understand that taking multiple samples can help them gauge the variation in their predictions.
- Make comparative inferences about two populations based on the data from random samples.
- Informally assess the degree of visual overlap between two distributions.

Essential Questions:

How can you use a sample to gain information about a population?

How can taking multiple samples help you when making inferences about a population?

How does increasing the sample size allow you to make more accurate predictions?

How can you determine if two samples are drawn from populations with similar means?

Assessment Evidence**Performance Tasks:**

- Warm-ups
- Exit Tickets
- Reveal Practice Assignments
- Formative Assessment Math Probe
- GoFormative Assignments

Other Evidence:

- Independent Work
- Class Discussions
- Online Activities
- Practice
- Homework

Benchmarks:

Departmental assessment for Module 11 will be developed from the following resources:

On-Level Assessments (Form A)- Three versions of the on-level assessment are available, Form A1, Form A2, and Form A3.

Differentiated Assessments (Form B and C)- Form B represents the approaching-level (AL) assessment. Form C represents the beyond-level (BL) assessment.

Learning Plan

Learning Activities:**Module 11-1: Biased and Unbiased Samples****• LAUNCH**

Students will participate in a real-world discussion about sampling using an infographic.

• EXPLORE & DEVELOP**○ Learn: Populations and Samples**

Students will learn about populations and samples.

○ Learn: Valid Sampling Methods

Students will learn about valid sampling methods.

▪ Example 1: Identify Valid Sampling Methods

Students will identify valid sampling methods that best represent survey descriptions.

○ Learn: Biased Samples

Students will learn about biased sampling methods.

▪ Example 2: Identify Biased Sampling Methods

Students will classify biased samples by type.

○ Learn: Valid Inferences

Students will learn about the differences between valid and invalid inferences.

▪ Example 3: Identify Valid Inferences

Students will identify the sampling method used in order to determine that an invalid inference was made.

▪ Example 4: Identify Valid Inferences

Students will identify the sampling method used in order to determine that a valid inference was made.

• REFLECT & PRACTICE**○ Exit Ticket**

Students will determine the number of students in an entire school who prefer having a certain type of pet (cat, dog or other) and design an unbiased sampling method that can be

used and explain why the sampling method is unbiased.

- **Practice (SE p. 583 – 584)**

Classify valid sampling methods from a situation. (1)

Classify biased samples by type. (2)

Interpret valid and invalid inferences made from a sample. (3-4)

Extend concepts learned in class to apply them in new contexts. (5)

Solve application problems involving biased and unbiased samples. (6-7)

Use higher-order and critical thinking skills. (8-11)

Module 11-2: Make Predictions

- **LAUNCH**

Students will participate in a real-world discussion about making predictions about television program viewing.

- **EXPLORE & DEVELOP**

- **Learn: Make Predictions**

Students will understand that they can make predictions about a population by using information from a survey, provided the survey used an unbiased sample.

- **Example 1: Make Predictions**

Students will use proportional reasoning to make a prediction about a population from a valid sample.

- **Example 2: Make Predictions**

Students will use proportional reasoning to make a prediction about a population from a valid sample.

- **Apply: Profit**

Students will come up with their own strategy to solve an application problem involving using surveys to predict profit.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will determine about how many people can be expected to watch the same television program at least once.

- **Practice (SE p. 591 – 592)**

Use proportional reasoning to make predictions about a population from a valid sample. (1-5)

Extend concepts learned in class to apply them to new contexts. (6)

Solve application problems involving making predictions. (7-8)

Use higher-order and critical thinking skills. (9-12)

Module 11-3: Generate Multiple Samples

- **LAUNCH**

Students will participate in a real-world discussion about the percentage of online games who pay to play the games.

- **EXPLORE & DEVELOP**

- **Explore:** Generate Multiple Samples

Students will explore how taking multiple samples can help them when making inferences about a population.

- **Learn:** Analyze Means of Multiple Samples

Students will understand that, by analyzing the means of multiple samples, that they can gain more insight into the true mean of the population.

- **Example 1:** Analyze Means of Multiple Samples

Students will analyze the means of multiple samples of data to predict the population mean and describe the variability of the distribution.

- **Explore:** Sample Size in Multiple Samples

Students will use Web Sketchpad to explore how increasing the sample size allows you to make more accurate predictions.

- **Apply:** Animal Science

Students will come up with their own strategy to solve an application problem involving how to infer manatee weights given data.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will describe at least one reason that might explain why the percents are different in a statewide survey vs a random sample from a school and which percent might be trusted more.

- **Practice (SE p. 601 – 602)**

Analyze multiple samples of data involving means of samples to gauge variation and make predictions. (1)

Extend concepts learned in class to apply them in new contexts. (2)

Solve application problems involving generating multiple samples. (3)

Use higher-order and critical thinking skills. (4-5)

Module 11-4: Compare Two Populations

- **LAUNCH**

Students will participate in a real-world discussion about comparing two samples of movie running times.

- **EXPLORE & DEVELOP**

- **Learn:** Shape of Data Distributions

Students will understand which measures of center and variability best represent asymmetric and symmetric distributions of data.

- **Learn:** Compare Two Populations

Students will understand that they can make comparative inferences about two populations by comparing their centers and variations.

- **Example 1:** Compare Two Populations

Students will make informal comparative inferences about two populations using a double dot plot with symmetric distributions.

- **Example 2:** Compare Two Populations

Students will make informal comparative inferences about two populations using a double box plot with asymmetric distributions.

- **Explore:** Compare Means of Two Populations

Students will use Web Sketchpad to explore whether samples drawn from different populations have similar means.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will compare two populations of movie running times and determine the inferences that can be made based on the double box plot.

- **Practice (SE p. 611 – 612)**

Make informal inferences about two populations using a double dot plot with symmetric distributions. (1)

Make informal inferences about two populations using a double box plot with asymmetric distributions. (2)

Extend concepts learned in class to apply them in new contexts. (3)

Solve application problems involving comparing populations. (4-5)

Use high-order and critical thinking skills. (6-8)

- **Formative Assessment Math Probe**

Students will understand that sets of data can be summarized as box plots that can be

analyzed and compared (minimum, lower quartile, median, upper quartile, maximum) even without a specific scale.

Module 11-5: Assess Visual Overlap

- **LAUNCH**

Students will participate in a real-world discussion about comparing two samples of height of Olympic athletes.

- **EXPLORE & DEVELOP**

- **Learn:** Interpret Visual Overlap

Students will learn how they can use a ratio to assess the degree of visual overlap between two samples in order to make an inference as to how likely the population means are similar or different.

- **Example 1:** Measure Variability Between Populations

Students will identify the constant of proportionality in equations.

- **REFLECT & PRACTICE**

- **Exit Ticket**

Students will sketch a dot plot that might show significant visual overlap between two samples, explain what this might indicate about the two populations and sketch a double dot plot that might show little, or no, overlap between the two samples and what this might indicate about the two populations.

- **Practice (SE p. 617 – 618)**

Make informal inferences about two populations based on their visual overlap. (1)

Extend concepts learned in class to apply them in new contexts. (2)

Solve application problems involving visual overlap. (3-4)

Use higher-order and critical thinking skills. (5-7)






Module 11 Review

Module 11 Assessment

Resources:

- **Teacher Edition:** McGraw Hill Reveal Math Course 2
- **Interactive Student Edition:** McGraw Hill Reveal Math Course 2
- **Technology:** McGraw Hill Online Platform, Teacher Laptop, Projector, Student Laptop, Calculators

Unit Modifications for Special Population Students

<p>Advanced Learners</p>	 <p>Refer to green BL (<i>Beyond Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Beyond Level Differentiated Activities • Extension Activities  <p>Use IXL to enhance targeted skills.</p>
<p>Struggling Learners</p>	 <p>Refer to orange AL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Remediation Activities • Extra Examples • <i>Arrive Math</i> Take Another Look Mini Lessons  <p>Use IXL to enhance targeted skills.</p>
<p>English Language Learners</p>	 <p>Refer to purple ELL (<i>Approaching Level</i>) indicators in Teacher Edition and assign corresponding activities:</p> <ul style="list-style-type: none"> • Spanish Interactive Student Edition • Spanish Personal Tutors • Math Language – Building Activities • Language Scaffolds • <i>Think About It!</i> and <i>Talk About It!</i> Prompts • Multilingual Glossary • Audio • Graphic Organizers • Web Sketchpad, Desmos and eTools
<p>Special Needs Learners</p>	<p>Each special education student has an Individualized Educational Plan (IEP) that details the specific accommodations, modifications, services, and support needed. This will enable that student to access the curriculum to the greatest extent possible in the least restrictive environment. These include:</p> <ul style="list-style-type: none"> • Variation of Time: adapting the time allotted for learning, task completion or testing • Variation of Input: adapting the way instruction is delivered

	<ul style="list-style-type: none"> • Variation of Output: adapting how a student can respond to instruction • Variation of Size: adapting the number of items the student is expected to complete • Modifying content, process, or product
Learners with a 504	Refer to page four in the Parent and Educator Resource Guide to Section 504 to assist in the development of appropriate plans.

Interdisciplinary Connections

Indicators:

Health and Physical Education (Grades 6-8)

2.2.8.PF.4

Implement and assess the effectiveness of a fitness plan based on health data, the assessment of one's personal fitness levels and monitor healthy/fitness indicators before, during and after the workout program.

Social Studies (Grades 6-8)

6.1.8.CivicsPI.3.d

Use data and other evidence to determine the extent to which demographics influenced the debate on representation in Congress and federalism by examining the New Jersey and Virginia plans.

6.3.8.CivicsPR.4

Use evidence and quantitative data to propose or defend a public policy related to climate change.

6.3.8.EconET.1

Using quantitative data, evaluate the opportunity cost of a proposed economic action, and take a position and support it (e.g., healthcare, education, transportation).

Science (Grades 6-8)

MS-LS4-1

Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.

MS-LS4-6

Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

MS-ESS2-3

Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

Integration of 21st Century Skills

Indicators:

From the Partnership for 21st Century Skills (P21), the deeper learning competencies and skills for 21st century learning in this unit include collaboration and communication.