Pace
Charter School of Hamilton

Math 7/Math 7 Honors

Unit 1: Integers

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

In this unit, students extend their understanding of addition, subtraction, multiplication, and division to the set of integers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts, students will explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. Students will use the language of algebra to represent and analyze relationships among variable quantities and solve problems involving algebraic concepts and processes. This study will create a foundation for learning the language of mathematics and the skills needed to move into a more conceptual understanding of numerical operations.

Recommended Pacing

30 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.

Standard: 7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 7.EE.A Use properties of operations to generate equivalent expressions.

CPI #	Cumulative Progress Indicator (CPI)
1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Standard: 7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

CPI #	Cumulative Progress Indicator (CPI)
4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities

Standard: 8.NS.A Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP7.	Employ valid and reliable research strategies.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Instructional Focus

Unit Enduring Understandings

- Rules of arithmetic together with the concept of equivalence allow us to transform equations and inequalities to solve problems.
- Equivalent expressions can be represented in a variety of forms
- Many real-world problems can be solved through the use of algebraic representation and reasoning

Unit Essential Questions

- How can arithmetic operations be extended to solve algebraic equations and inequalities?
- How can numerical operations and properties be extended to algebraic expressions?
- How can I represent real life situations algebraically?
- How can real numbers be used to quantify situations and events?

Objectives

Students will know:

- *Terms:* square roots, perfect squares, expression, equation, inequality, absolute value, additive inverse, base, cube root, exponent, integer, opposites, perfect square, power, radical sign, square root
- *Procedures:* integer order of operations, simplify algebraic expressions, simplify and solve multi-step equations, solve and graph inequalities

Students will be able to:

- Fluently add, subtract, multiply, and divide integers.
- Apply operations with integers to simplify numerical expressions using the order of operations
- Identify, describe, and find the absolute value of integers.
- Translate words into algebraic expressions, equations, and inequalities
- Simplify expressions by distributing and combining like terms
- Determine if a given value is a solution to an equation or inequality
- Interpret and represent solutions to inequalities on a number line
- Evaluate square roots.
- Use the properties of integer exponents to generate equivalent expressions.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2 Accelerated, McCaw 2018

Unit 2: Rational Numbers

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

Number sense and fluency are important traits of successful mathematicians. An understanding of numbers and how they relate to each other is the foundation of all mathematical learning. In this unit, students will continue to develop their number sense by performing and analyzing standard numerical operations and estimations. Students will extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations. This unit will continue to expand students' abilities to use algebraic equations to model situations.

Recommended Pacing

21 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
6	Attend to precision.
7	Look for and make use of structure.

Standard: 7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

CPI #	Cumulative Progress Indicator (CPI)
2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
3	Solve real-world and mathematical problems involving the four operations with rational numbers.

Standard: 7.EE.A Use properties of operations to generate equivalent expressions.

CPI #	Cumulative Progress Indicator (CPI)
1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Standard: 7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

CPI #	Cumulative Progress Indicator (CPI)
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.

4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP7.	Employ valid and reliable research strategies.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
Instructional Focus	
Unit Enduring Understandings	
● There are many ways to represent the same quantity. ● Many real-world problems can be solved through the use of computation, algebraic representation and reasoning. ● The rules of mathematics are consistent for each set of numbers.	
Unit Essential Questions	
● Was form of a number is the best representation of that number? ● How can decimal numbers and fractional values be used to describe or quantify real world situations? ● How are mathematical operations between different sets of numbers related?	

Objectives

Students will know:

- *Terms:* greatest common factor, least common denominator, equivalent fractions, numerator, denominator, rational numbers, rational numbers
- *Procedures:* compare positive and negative decimal values, procedure for converting fractions and decimals, simplifying numerical expressions with rational numbers, solving multi-step equations with rational numbers, writing and solving equations with rational numbers

Students will be able to:

- Fluently add, subtract, multiply and divide rational numbers.
- Explore number sense with rational numbers
- Compare, and order rational numbers
- Evaluate algebraic expressions with rational numbers
- Solve one-step and two-step rational equations and equations involving simplifying
- Write and solve decimal equations to find solutions to real world problems

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2 Accelerated, McCaw 2018

Unit 3: Ratios, Rates, Proportions

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

Students extend their understanding of ratios and develop understanding of proportionality to solve real-world applications. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line. This unit makes connections between students' previous knowledge of proportional relationships to expressing proportional relationships in tables, equations, and graphs.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: 7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.

CPI #	Cumulative Progress Indicator (CPI)
1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
2	Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. *c.* Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn*. d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r)* where *r* is the unit rate.

3	Use proportional relationships to solve multistep ratio and percent problems.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.

Instructional Focus

Unit Enduring Understandings

- Ratios, rates, and proportions are ideas that help us compare and communicate about the relationships between quantities.
- Proportional relationships can be expressed through equations, tables, and graphs. There are situations, contexts and problems where each of these is the most efficient way to communicate about the quantity

Unit Essential Questions

- How do ratios, rates and proportions help us make decisions?
- Why are proportional relationships displayed in different representations?
- Can you express a real-world scenario as a proportional relationship?

Objectives

Students will know:

Terms: ratio, rate, unit rate, unit price, complex fractions, proportion, similarity, scale, constant of proportionality

Formulas: distance formula (D=rt)

Procedures: expressing a ratio in multiple forms, calculating unit rate, comparing unit price to find better buy, writing and solving a proportion, solve problems involving similar figures and scale, find and use constant of proportional, express proportional relationships using tables, graphs, and equations

Students will be able to:

- Find unit rates including those associated with ratios of fractions
- Identify unit price to compare quantities and determine better buy
- Use proportions to solve real-world and mathematical situations
- Use proportions to solve problems involving similar figures and scale
- Use the distance formula to solve for distance, rate, or time
- Decide whether two quantities are proportional using tables and graphs
- Represent proportional relationships with models including equations, tables, graphs, and verbal descriptions
    - Explain what a point (x,y) means on proportional graph in context, particularly (0,0) and (1,r) where r is the unit rate.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems, Course 2 Accelerated, McCaw, 2018

Unit 4: Percents

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

This unit focuses on problem solving with percents. Students learn to apply percent proportions, percent equations, and percent estimation skills to real-world problems. Using decimal and fraction equivalents for percents, students solve problems involving percent of change, sales tax, tip, discount, and simple interest. Students will use the reasoning skills they learn to make decisions in the real world about products and services they intend to purchase.

Recommended Pacing

17 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: 7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.

CPI #	Cumulative Progress Indicator (CPI)
3	Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

Standard: 7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

CPI #	Cumulative Progress Indicator (CPI)
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.

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
Instructional Focus	
Unit Enduring Understandings	
● Fractions, decimals and percents can be used to represent equivalent forms of the same value ● Percent problems can be solved using a variety of techniques such as mental math, proportions, and equations ● Percents can be used to make decisions in real world problems	
Unit Essential Questions	
● When is it most appropriate to use a fraction, a decimal, or a percentage? ● How do you recognize the most efficient way to calculate a percentage? ● How are percents used to describe or quantify real-world situations?	
Objectives	
Students will know: ● *Terms:* percent, percent of change, markup, discount, sales tax, commission, interest, principal, tip, taxes ● *Procedures:* converting between fraction, decimal, and percent, finding percent using mental math, estimating tip, finding discount and sales price, finding commission, calculating percent of change, calculating sales tax, finding simple interest, finding paycheck taxes	

Students will be able to:

- Use common fraction-decimal-percent equivalencies
- Convert between fractions, decimals, and percents
- Use strategies for solving mental math percent problems including tips
- Solve percent problems (find percent, part or whole) using proportions or equations
- Find discount and sale price, sales tax, commission, paycheck taxes, simple interest, percent of change.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2, Accelerated, McCaw, 2018

Unit 5: Geometric Concepts

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

This unit provides an analysis of geometric figures and relationships as they relate to both abstract mathematical concepts as well as real-world problem situations. Topics include constructing and describing geometric figures, finding missing angle measurements, and identifying attributes of geometric figures. Students will use formulas for area and circumference in order to solve real world and mathematical problems. They will extend their understanding to three-dimensional solid figures through the exploration of surface area and volume. Geometry is a critical component of mathematics education because students are required to integrate logical reasoning and spatial visualization skills. Students will develop spatial sense and the ability to use geometric properties, relationships and measurement to model, describe, and analyze phenomena

Recommended Pacing

27 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
4	Model with mathematics
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: 7.G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

CPI #	Cumulative Progress Indicator (CPI)
4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle
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.
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.

Standard: 8.G.C Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	
CPI #	**Cumulative Progress Indicator (CPI)**
9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
CPI #	Earth's Systems
MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
Instructional Focus	
Unit Enduring Understandings	
● Geometric concepts, relationships, and measurement are an attempt to model, describe, classify, and analyze real world objects. ● Classifying figures requires the ability to look for common attributes and notice differences in figures.	

Unit Essential Questions

- How can the application of the attributes of geometric figures support mathematical reasoning and problem solving?
- What are the unifying attributes of different groups of polygons?

Objectives

Students will know:

- *Terms:* vertical angles, alternate interior angles, alternate exterior angles, corresponding angles, parallel and perpendicular lines, complementary and supplementary angles, triangles, quadrilaterals, and regular and irregular: pentagons, hexagons, heptagons, octagons, nonagons, decagons, hendecagons, and dodecagons and circles, scalene, equilateral, isosceles, congruent, transversal, radius, diameter, chord, base, height, volume, surface area, solid, faces, bases, prism, pyramid, cylinder, cone, edge, vertex
- *Symbols:* line, ray, segment, angle, plane, parallel and perpendicular
- *Formulas:* Circumference, area of a circle, area of regular and irregular polygons, volume of prisms, cylinders, cones and pyramids, surface Area of prisms and cylinders

Students will be able to:

- Measure and describe relationships among supplementary, complementary, vertical and adjacent angles.
- Classify and determine the measure of angles created when parallel lines are cut by a transversal.
- Demonstrate that the sum of the interior angle measures of a triangle is 180 degrees and apply this fact to find the unknown measures of angles and the sum of the angles of polygons.
- Use properties of polygons and be able to apply algebraic equations to find missing measures
- Find circumference of circles or irregular figures
- Find perimeters and areas of composite two-dimensional figures
- Find area of circles and irregular figures with parts of circles
- Find surface area of prisms and cylinders
- Calculate the volume of prisms, pyramids, cones, and cylinders
- Find the missing dimension given the area or volume of a figure.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2, Accelerated, McCaw, 2018

Unit 6: Probability

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

In this unit, students will explore ways to calculate probabilities to describe seemingly random events. Through investigating chance processes, students will develop, use, and evaluate probability models to make predictions or decisions. Interpreting these probabilities relies on an understanding of independence and conditional probability.

Recommended Pacing

9 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: 7.SP.C Investigate chance processes and develop, use, and evaluate probability models.

CPI #	Cumulative Progress Indicator (CPI)
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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
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	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 the discrepancy
8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
CPI #	Earth's Systems
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
Instructional Focus	
Unit Enduring Understandings	
● Probability is about prediction over the long term rather than predictions of individual events. ● There are patterns of chance in numerical outcomes that statisticians use to predict the future	
Unit Essential Questions	
● How can experimental and theoretical probabilities be used to make predictions or draw conclusions? ● How is probability related to real world events?	
Objectives	
Students will know: ● *Terms:* simple probability, certain, impossible, outcomes, event, theoretical probability, experimental probability, trial, simple event, compound event, random event, sample space, compound probability, independent events, dependent events, uniform, non-uniform, Law of Large Numbers ● *Procedures:* finding simple probability, finding experimental probability, finding theoretical probability, identifying and calculating independent and dependent events, uniform vs. non-uniform probability	

Students will be able to:

- Develop probability models and use them to find probabilities.
- Find the probabilities of compound events using organized lists, tables, tree diagrams, and simulations
- Calculate the probability of a compound event
- Express probability as a fraction, decimal, or percent
- Compare experimental and theoretical probability

  Identify and create uniform and non-uniform probability models

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2, Accelerated, McCaw, 2018

Unit 7: Algebra Extensions

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

In this unit, students will work closely with one variable equations and inequalities. Students will use the language of algebra to represent and analyze relationships among variable quantities and solve more complex problems involving algebraic concepts and processes. This study will continue to build a foundation for learning the language of mathematics and the skills needed to move into a more conceptual understanding of numerical operations.

Recommended Pacing

9 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: 7.EE.A Use properties of operations to generate equivalent expressions.

CPI #	Cumulative Progress Indicator (CPI)
1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Standard: 7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

CPI #	Cumulative Progress Indicator (CPI)
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
4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities

Standard: 8.EE.A Work with radicals and integer exponents.

CPI #	Cumulative Progress Indicator (CPI)
2	Use square root and cube root symbols to represent solutions to equations of the form x^2 = p and x^3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes.

Standard: 8.EE.C Analyze and solve linear equations and pairs of simultaneous linear equations.	
CPI #	**Cumulative Progress Indicator (CPI)**
7	Solve linear equations in one variable
Standard: 8.G.B Understand and apply the Pythagorean Theorem.	
CPI #	**Cumulative Progress Indicator (CPI)**
7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions
8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
CPI #	Earth's Systems
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Instructional Focus

Unit Enduring Understandings

- Equations and inequalities are powerful tools for exploring, reasoning about, and representing situations.
- Algebraic properties can generate equivalent expressions and equations even when their symbolic forms differ.
- There are different ways to represent the solution set to an inequality.

Unit Essential Questions

- How do you know that two equations are equivalent?
- How can equations and inequalities be used to represent real-world situations?
- What does the solution to an inequality represent in the context of the situation?

Objectives

Students will know:

- *Terms:* Pythagorean Theorem, hypotenuse, leg

Students will be able to:

- Use mathematical properties in order to solve equations and inequalities with variables on both sides
- Solve fraction and decimal equations
- Apply the properties of math in order to transform linear equations for given variable
- Evaluate square root expressions
- Use the Pythagorean Theorem to find the lengths of legs or the hypotenuse

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2, Accelerated, McCaw, 2018

Unit 8: Linear Functions

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

Functions are used in every branch of mathematics- as algebraic operations on numbers, transformations on points in the plane or in space, intersection and union of pairs of sets, and so forth. Functions are a unifying concept in all mathematics and display relationships among phenomena in everyday life. In this unit, students will explore linear functions. By reasoning abstractly and quantitatively, students will extend their thinking to connect functions to their equations, graphs and tables.

Recommended Pacing

10 days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: 8.EE.B Understand the connections between proportional relationships, lines, and linear equations.

CPI #	Cumulative Progress Indicator (CPI)
5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Standard: 8.F.A Define, evaluate, and compare functions.

CPI #	Cumulative Progress Indicator (CPI)
3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

Standard: 8.F.B Use functions to model relationships between quantities.

CPI #	Cumulative Progress Indicator (CPI)
4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
Instructional Focus	
Unit Enduring Understandings	
● Linear relationships can be expressed verbally, graphically, numerically, and symbolically. ● Graphs and equations are alternative (and often equivalent) ways for depicting and analyzing patterns of change.	
Unit Essential Questions	
● What is the best form of a function? ● What do graphs convey about the real-world situations they model? ● What does slope represent about the relationship between two variables?	

Objectives

Students will know:

Terms: linear, slope, intercept, slope-intercept form

Formulas: slope formula

Students will be able to:

- Find slope given the graph of a linear equation
- Find slope using the slope formula when given a table of values
- Graph a linear equation using slope-intercept form
- Write a linear equation from a given graph

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Course 2, Accelerated, McCaw, 2018

Unit 9: Finance

Content Area: Mathematics

Course & Grade Level: Math 7 Honors/Math 7

Summary and Rationale

Financial literacy for students is an important tool to improve the financial capability of our youth and communities. Students should be taught how to handle money—both at home and in school. This will help reduce the economic impact of the long-term recession that now grips many communities across the country. Teaching students about money has a great impact on their future. Grasping even the most basic lessons gets students considering available options before making important monetary decisions; in turn, this careful consideration may help them avoid personal debt and improve their chances of achieving financial security.

Recommended Pacing

8 days

New Jersey Student Learning Standards Financial Literacy

9.1.8.A.1	Explain the meaning and purposes of taxes and tax deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay
9.1.8.A.2	Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.A.3	Differentiate among ways that workers can improve earning power through the acquisition of new knowledge and skills.
9.1.8.A.5	Relate how the demand for certain skills determines an individual's earning power.
9.1.8.A.6	Explain how income affects spending decisions.
9.1.8.A.7	Explain the purpose of the payroll deduction process, taxable income, and employee benefits.

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Interdisciplinary Standards Science	
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people that may limit possible solutions.

Instructional Focus

Unit Enduring Understandings

- We must understand the difference between our wants and needs and use that information to make informed decisions for our business.
- We need to understand the type of education that we need in order to meet our career goals.
- We must understand our personal and financial goals and how to reach them.
- Taxes will be deducted from your pay

Unit Essential Questions

- How do we prioritize wants and needs when making purchases?
- How does education impact employment?
- Will your choice in career support your lifestyle choices?
- How do taxes contribute to a better society?

Objectives

- Summarize the advantages and disadvantages of becoming an entrepreneur.
- Describe how entrepreneurship differs from working for a paycheck from an employer.
- Determine their personal aptitude for entrepreneurship using one or more online assessment tools.
- Describe how entrepreneurs must manage their finances in a different way than employees do
- Describe different types of taxes in the U.S. and what the money collected from taxes is used for.
- Demonstrate understanding of federal income tax brackets and marginal tax rates.
- Apply understanding of the difference between tax credits and tax deductions to case study scenarios. Explain common health insurance terms such as deductible, coinsurance, and copayment.
- Complete math problems that apply health insurance terminology.
- Compare the costs and features of various health insurance plans.
- Explain what can happen when people lack health insurance.
- Define the terms “needs” and “wants” and distinguish between them with real world examples.

- Determine criteria to make budgeting decisions and prioritize household expenses.
- Define the term “opportunity cost” and provide real world examples of spending plan trade-offs.
- Track personal expenses and develop a personal spending plan/budget using an online calculator.
- Define the goals they need to achieve to start in their chosen careers.
- Explore career clusters and the specific pathway associated with their goal occupation.
- Explore other career options that all relate to their interests

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments or assessments found in the model curriculum.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: None

Suggested Resources: NJ Model Curriculum Lessons 1,6,8,10

https://www.careeronestop.org/ExploreCareers/explore-careers.aspx?&frd=true

https://www.usa.gov/government-jobs-lesson-plan?source=kids