PUBLIC SCHOOLS OF EDISON TOWNSHIP

OFFICE OF CURRICULUM AND INSTRUCTION

Pre-Algebra

Length of Course: Term

Elective/Required: Required

Schools: Middle Schools

Eligibility: Grade 6 - 7

Credit Value: N/A

Date Approved: August 23, 2022

TABLE OF CONTENTS

Modifications will be made to accommodate IEP mandates for classified students

INTRODUCTION

The New Jersey Student Learning Standards for Mathematics are intended to provide students with a solid foundation in mathematics that will prepare them for success in the global society. The Standards for Mathematical Content are a balanced combination of procedure and understanding.

Mathematical Practice Standards:

This curriculum guide is standards based which reflects the New Jersey Student Learning Standards for Mathematics, the Mathematical Practices that are expected to be used in teaching mathematics K-12 are as follows and infused throughout the guide:

- Make sense of problems and persevere in solving them. Use appropriate tools strategically.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others. Model with mathematics.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Technology within the Curriculum:

Please refer to the Resources and Instructional Adjustments columns on the curriculum guide at the end of each unit.

National / International Technology Student Standard:

Standard 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

- Empowered Learner: Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.
- Digital Citizenship: Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.
- Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.
- Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals. Career Ready

Practices within the Curriculum:

Please refer to the Recommended Activities and Strategies column on the curriculum guide.

College Ready practices are practices that have been linked to increase college, career, and life success.

- CRP1. Act as a responsible and contributing citizen and employee
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Us-e technology to enhance productivity

SCOPE & SEQUENCE: Pre-Algebra Grades 6 and 7

MARKING PERIOD 1	MARKING PERIOD 2
Unit 1: Integers Adding and Subtracting Integers Multiplying and Dividing Integers Rational Numbers Operations Order of Operations **Unit 2: Algebraic Expressions** Algebraic Expressions The Distributive Property Equivalent Expressions	**Unit 3: Linear Equations and Inequalities** Solving One-Step Equations Solving Multi-Step Equations Solutions to Linear Equations Solving Linear Inequalities **Unit 4: Rates and Ratios** Ratios Unit Rates Rates and Ratios with Complex Fractions
MARKING PERIOD 3	MARKING PERIOD 4
Unit 5: Proportional Relationships and Functions Proportional Relationships Problem Solving with Proportions Displays of Proportional Relationships Calculating Slope from Graphs The Slope Formula Graphing Using Slope-Intercept Form Writing Linear Equations for Graphs **Unit 6: Percents** Fractions, Decimals and Percents Percent of a Number Percent of Change Percent Applications	**Unit 7: Radicals and Exponent Properties** Multiplication and Division Properties of Exponents Scientific Notation and its Applications Solving Equations with Exponents Cube Roots and Square Roots Simplifying Roots Pythagorean Theorem **Unit 8: Geometry** Angle Relationships Areas of Polygons Circumference and Area of Circles Composite Figures Three-Dimensional Figures Surface Area of Prisms and Pyramids Volume of Prisms and Cylinders

Please note: Instructors will change their pacing and timing as needed to accommodate class periods available.

Unit 1: Integer Operations

Essential Questions	Enduring Understandings
- What is the relationship between an integer and a rational number? - What patterns do you notice when you add, subtract, multiply, and divide integers? - How do I know which mathematical operation to use within problem situations?	- All numbers are organized based on their characteristics and patterns. - Rational numbers are positive and negative numbers including decimals, and zero. Positive and negative rational numbers can be used in real life application when dealing with temperature, height above or below sea level, money earned or spent, etc..

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Grade 6 Only Represent real-world situations using positive and negative numbers. Compare and order integers Develop an understanding of the meaning of "opposite of a number." Identify the absolute value of a number	**NJSLS 6.NS.5c** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **NJSLS 6.NS.7c** Understand ordering and absolute value of rational numbers.	**EdGems** MATHO Ticket Time **Desmos** Candy Rating Six Sliding Spots **Additional Tasks** Integer Slides Tasks Integers in the real world Comparing Integers Picture Reveal	Students will be formatively assessed through: - Teacher Observations - Do Nows - Exit Slips - Classwork - Extended Learning Activities - Stations - Educational Games Summative assessments include: - Minor Assessments - Major Assessments - Performance Assessments
Express the distance between numbers on the number line as the absolute value of their difference.	**NJSLS 7.NS.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.	**Desmos** Coldest Christmas on Record Adding Integers Splat	
Combine opposite quantities to make zero pairs.	**NJSLS 7.NS.1a**: Describe situations in which opposite quantities combine to make 0	**EdGems Lessons 2.1 & 2.3** Climb the Ladder	

Pre-Algebra

Add and subtract integers.	**NJSLS 7.NS.1b**: Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **NJSLS 7.NS.1c:** Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (−q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	**Desmos** Integer Game Integer Chutes & Ladders Anchors & Floats **Additional Activities** Adding Integers Partner Pizza Race Maze Collect & Find Picture Reveal Adding Integer Picture Reveal Escape Room Word Problem Maze	
Multiply and divide integers.	**NJSLS 7.NS.2:** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **NJSLS 7.NS.2a:** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (−1)(−1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. **NJSLS 7.NS.2b:** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -p/q = (-p)/q = p/(-q)	**EdGems Lessons 3.1** Always, Sometimes, Never Stations - Real World Connections **Desmos** Multiplying Integers **Additional Activities** Escape Room Challenge (Mixed Ops) Operations with Integers Bingo	
Interpret sums and differences of rational	**NJSLS 7.NS.1d:** Apply properties of operations as strategies to add and subtract rational numbers.	**EdGems Lessons 2.2, 2.4, 3.2 & 3.3** Always, Sometimes, Never Partner Math	

numbers. Interpret products and quotients of rational numbers.	**NJSLS 7.NS.2c:** Apply properties of operations as strategies to multiply and divide rational numbers.	Relay MATHO Masterpiece Climb the Ladder Ticket Time **Additional Activities** Multiplying Decimals Maze	
Solve real world problems by adding, subtracting, multiplying and dividing rational numbers.	**NJSLS 7.NS.3**: Solve real-world and mathematical problems involving the four operations with rational numbers.	**EdGems Lesson 3.4** Challenge: Task Rotations **Additional Activities** Breakout Room Operations with Integers Mystery Picture Operations with integers maze Operations with Rationals Maze Operations with decimals *Order of Operations* Partner Practice Drag & Drop Challenge: Math Lib	

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		Instructional Adjustments: Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process.

| www.ck12.org
www.mathjong.com
Pear Deck
Socrative
Edpuzzle
Quizizz
Nearpod | ● Assessments | ● Use Google Apps for Education
● Create a study guide for intervention
● Build a glossary notebook
Common Misconceptions:
● Students may overlook negative numbers
● Students may make mistakes with various operations involving integers and rational numbers
● Students may not find a common denominator when adding or subtracting fractions. |

Unit 2: Algebraic Expressions	
Essential Questions	**Enduring Understandings**
● What are the various methods that can be used to evaluate numerical and algebraic expressions? ● How do we apply mathematical properties/operations to simplify algebraic expressions?	● Numerical and algebraic expressions can be simplified/evaluated using order of operations and computation of rational numbers.

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Grade 6 Only Identify and understand parts of algebraic expressions.	**NJSLS. 6.EE.2b:** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient coefficient); view one or more parts of an expression as a single entity.	**Desmos** Polygraph **Additional Activities** EdPuzzle Parts of Expressions Maze Parts of Expressions Matching Mystery Picture Practice Slide Quick Color	Students will be formatively assessed through: ● Teacher Observations ● Do Nows ● Exit Slips ● Classwork ● Extended Learning Activities ● Stations ● Educational Games Summative assessments include: ● Minor Assessments ● Major Assessments ● Performance Assessments
Translate and write algebraic expressions. Evaluate algebraic expressions.	**NJSLS 6.EE.2:** Write, read and evaluate expressions in which letters stand for numbers.	**EdGems Lesson 6.1** Stations (Leveled) **Additional Activities** Sudoku Translating Matching Slides Mystery Picture Scavenger Hunt Self-Checking Task Cards Pixel Art	
Use the Distributive Property to write equivalent	**NJSLS 7.EE.1:** Apply properties of operations as strategies to add, subtract,	**EdGems Lesson 6.2** Ticket Time	

expressions.	factor, and expand linear expressions with rational coefficients. **NJSLS 7.EE.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.	**Desmos** Burgers & Fries **Additional Activities** Sticker Reveal Maze
Simplify expressions using the Distributive Property and combining like terms.	**NJSLS 7.EE.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.	**EdGems Lesson 6.3** MATHO Always, Sometimes, Never Partner Math Ticket Time #1 Ticket Time #2 **Desmos** Equivalent Expressions **Additional Activities** Simplifying Expressions SCOOT Combining Like Terms MathLib

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		**Instructional Adjustments:** Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook

Edpuzzle Quizizz Nearpod		**Common Misconceptions:** ● Students may confuse negative signs with minus signs in variable expressions, which often results in incorrect strategies in evaluating algebra problems. ● When applying the Distributive Property, students multiply the factor outside the parentheses by just one of the inside factors. ● Students who struggle with simplifying fractions (seeing greatest common factors) may struggle with factoring expressions. ● When students work through steps in an expression, they may forget about applying the order of operations.

Unit 3: Equations and Inequalities	
Essential Questions	**Enduring Understandings**
- What is the purpose of an equation? - How do we apply mathematical properties/operations to solve equations? - How does the solution of an inequality differ from that of an equation?	- Numerical and algebraic expressions can be simplified/evaluated using order of operations and computation of rational numbers. - Equations are used to model real life problems. - Inverse operations are used to solve equations. - Inequalities have many solutions shown by plotting on a graph.

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Solve one and two step equations by simplifying and applying inverse operations to solve.	**NJSLS 7.EE.4a:** 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.	**EdGems Lesson 7.1** Climb the Ladder **Desmos** Hangers (1-step Intro) 2-Step Equations Splat **Additional Activities** 1-Step Equations Pixel Art (level 1 pos only, level 2 mixed) Digital Bingo Build a Sundae (Positives Only) Word Problem Error Analysis Digital Chain Writing 2-step Equations 2 Step Equations Math Lib	Students will be formatively assessed through: - Teacher Observations - Do Nows - Exit Slips - Classwork - Extended Learning Activities - Stations - Educational Games Summative assessments include: - Minor Assessments - Major Assessments - Performance Assessments
Model, create and solve multi-step equations equations.	**NJSLS 8.EE.7b:** Solve linear equations with rational number	**EdGems Lesson 7.2** Partner Math	

	coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	**Desmos** Solving Multi-Step Equations **Additional Activities** Digital Puzzle Collect & find Sticker reveal Digital puzzle Mystery Picture *With Variables on Both Sides* Color by Number Color by Number (More Challenging) Mystery Picture Matching - Writing Equations Digital Pyramid *Extension: Literal Equations* Literal Equations Coloring Literal Equations Task Cards	
Determine if a linear equation in one variable has no solution, one solution or infinitely many solutions.	**NJSLS 8.EE.7a:** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	**EdGems Lesson 7.3** Ticket Time Always, Sometimes, Never Climb the Ladder **Desmos** Many, No, or One Solution	
Grade 6 Only Represent and write inequalities Relate a written inequality to the	**NJSLS 6.EE.B.8** Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x <	**EdGems** Stations Four Corners Always, Sometimes, Never	

position of numbers on the number line. Compare and interpret rational numbers in real-world contexts.	c have infinitely many solutions; represent solutions of such inequalities on number line diagrams. **NJSLS 6.NS.C.7** Understand ordering and absolute value of rational numbers. **NJSLS 6.NS.C.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right. **NJSLS 6.NS.C.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 C > –7 C to express the fact that –3 C is warmer than –7 C.	**Desmos** Inequalities on the Number Line Graphing Inequalities Polygraph: Inequalities **Additional Activities** What Rides Can You Ride? (PBL) Inequalities Task Cards Inequalities Digital Tasks Graphing Inequalities Scavenger Hunt	
Solve multi-step inequalities and graph the solution on a number line.	**CCSS 7EE.4b:** 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.	**EdGems Lesson 7.7** Four Corners Stations Relay Race **Additional Activities** 2-Step Maze 2-Step Matching Multi-Step Escape Room *Extension: Compound Inequalities* On the Number Line Desmos	

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		Instructional Adjustments: Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative Edpuzzle Quizizz Nearpod	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook **Common Misconceptions:** ● Students may struggle to isolate the variable and solve equations with rational numbers. ● Students may not set up an inequality correctly based on a real-world situation. ● Students may not use the correct inequality symbol or may not use the correct point (included or not included) when graphing their solution.

Unit 4: Ratios and Rates	
Essential Questions	**Enduring Understandings**
- What is the rate? What kinds of real world relationships are rates? - What is a ratio? How can a ratio help us understand relationships between quantities? - How can unit rates help to make comparisons and solve problems? - How can understanding unit rate, markup, and discount make you a smart and thrifty consumer? - How can you scale objects? Why is this useful?	- A rate is the ratio between two different quantities that have units (related quantities). Real-world relationships that are rates include unit price, scale models, recipe measurements, etc. - Reason through unit price, better buy. - A unit rate can be used to determine which products constitute the better buy. - Proportions and similar figures are used to find heights of tall trees and other objects that are not easy to measure directly. - A proportion can be used to find actual distances from a map or sizes of actual objects from a scale model. - An object may need to be dilated using a scale factor in order to prove two figures are similar.

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Write a ratio to describe a relationship between 2 quantities. Compare and contrast ratios. Determine equivalent ratios. Apply knowledge of ratios and rates to solve real world problems.	**CCSS 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.	**EdGems - Lesson 1.1** MATHO **Desmos** Balloon Float Water Slide	Students will be formatively assessed through: Teacher Observations Do Nows Exit Slips Classwork Extended Learning Activities Stations Educational Games Summative assessments include: Minor Assessments Major Assessments

Pre-Algebra

		EdGems - Lessons 1.2 and 1.3	Performance Assessments
Identify rate and create a definition for unit rate. Apply concepts of unit rate to problem solve. Compute unit rates with ratios made up of fractions.		Ticket Time MATHO Stations Partner Math **Desmos** Better Deal Click Battle **Additional Activities** Mystery Picture Drag & Drop Maze Complex Fraction Activity	
For Grade 6 (Grade 7 extension) Determine if triangles are similar or congruent Find missing measures	**NJSLS. 8.G.5**: Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	**EdGems Lesson 9.4** Partner Math **Desmos** Similar Figures & Proportions **Additional Activities** Math Lib	
Compute lengths and areas of scaled drawings from actual figures. Compute scale factor when given an actual figure and a scale drawing.	**CCSS 7.G.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.	**EdGems - Lesson 1.4** Masterpiece Relay Task Rotations **Additional Activities** Maze Apartment Performance Task Scale Factor Pixel Art	

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		Instructional Adjustments: Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative Edpuzzle Quizizz Nearpod	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook **Common Misconceptions:** ● Students may struggle to solve problems with complex fractions. ● Students may mix up the order of the numbers in a ratio. ● Students may confuse a part to part ratio with a part to total ratio. ● Students may struggle with setting up a rate from an application situation by mixing up the numerator and denominator.

Pre-Algebra

Unit 5: Proportional Relationships and Functions

Essential Questions	Enduring Understandings
- What is a proportional relationship? How can proportional relationships be used to model real world situations? - How can ratios and proportions allow you to determine your travel time on a road trip? - How do proportions help determine measurements of very tall objects? - How can you identify a proportional relationship from a table? Graph? Equation? - What is slope? - How can the slope and the y-intercept be used to graph and write linear equations?	- All proportional relationships are linear equations, but not all linear equations are proportional. - The graph of a proportional relationship is a straight line through the origin. - The unit rate, or constant of proportionality, is k in the equation y =kx, and r in the point (1, r) - That slope is the rate of change between any two points. - Linear equations can be represented by equations and on graphs.

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Determine if ratios form a proportion and solve for a missing value in a proportion. Solve problems by writing and solving proportions	**CCSS 7.RP.2a:** Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin **CCSS 7.RP.2c:** Represent proportional relationships by equations. **CCSS 7.RP.3:** Use proportional relationships to solve multi-step ratio and percent problems.	**EdGems - Lessons 4.1 and 4.2** MATHO Task Rotation **Desmos** Marcellus the Giant **Additional Activities** Maze Pixel Art Picture Reveal Task Cards Proportions Word Problem Matching Pixel Art Leveled	Students will be formatively assessed through: Teacher Observations Do Nows Exit Slips Classwork Extended Learning Activities Stations Educational Games Summative assessments include: Minor Assessments Major Assessments Performance Assessments

Pre-Algebra

Recognize and represent proportional relationships from tables, graphs and equations What is the constant of proportionality? How can you distinguish relationships that are proportional from relationships that are not proportional? Relate the constant of proportionality to unit rate.	**CCSS 7.RP.2b:** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **CCSS 7.RP.2d:** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	**EdGems - Lesson 4.3** Relay **Desmos** Take a Hike Proportional Graphs Proportional Relationships **Additional Activities** Build a Snowman Proportional Graphs Practice Mystery, Maze & Madlib Digital Coloring Proportional Relationships Slides
Find the slope of a line from a graph Find the slope of a line using the slope formula	**CCSS 8.EE.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	**EdGems - Lesson 4.4 and 4.5** Climb the Ladder Partner Math **Desmos** Space Invader Slopes Slope Activity Polygraph **Additional Activities** Types of Slope Calculating Slope Break the Lock Build a Burger Error Analysis Slope Stations
Graph linear equations in slope-intercept form. Write linear Equations for a given graph		**EdGems - Lesson 4.6 and 4.7** Four Corners MATHO **Additional Activities** Graphing Lines Slides Pawn Shop, MixUp (Graphing) Drag & Drop Slides

Pre-Algebra

		Graphing Slides Khan Academy:Equation from a Graph	

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		**Instructional Adjustments:** Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative Edpuzzle Quizizz Nearpod	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook **Common Misconceptions:** ● Students may forget that proportional relationships must go through the origin (0,0) ● Students may confuse a constant rate of change with a horizontal line.

Unit 6: Percents	
Essential Questions	**Enduring Understandings**
- In what way are fractions, decimals and percents used interchangeably? - How can we express rates and ratios as a percent? - How can the percent formula be used to find parts, wholes or percents given two of the three pieces of data? - In what ways are the percent formula and percent proportions are related? - What "key" words help to identify the part and the whole in problems with percent?	- Fractions can be written as decimals, some of which are non-repeating, non-terminating decimals called irrational numbers. - Proportions are used to solve basic percent problems and applications of percent. - Knowing applications of percent such as discount, sales tax, and markup can help one to be an informed consumer and make good purchasing decisions. - Success in using and understanding percents is an essential skill required by every field and individual in society

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Connect the different forms of rational numbers (percents, fractions and decimals).	**CCSS 7.NS.2d:** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	**EdGems - Lesson 5.1** Partner Math **Desmos** Battery Card Sort Polygraph **Additional Activities** Ice Cream Coloring Self-Checking Sheets Maze	Students will be formatively assessed through: - Teacher Observations - Do Nows - Exit Slips - Classwork - Extended Learning Activities - Stations - Educational Games Summative assessments include: - Minor Assessments - Major Assessments - Performance Assessments
Apply an understanding of percent as a ratio to 100 to	**CCSS 7.RP.3:** Use proportional relationships to solve multi-step ratio	**EdGems - Lesson 5.2** Stations	

solve for the part, whole or the percent. Find the solution to multi-step ratio word problems	and percent problems.	**Desmos** Des Farm **Additional Activities** Maze Mystery Image Digital Bingo	
Solve problems involving percent change Solve problems involving the percent error when given a real-world scenario		**EdGems - Lesson 5.3** Relay **Desmos** Percent of Increase or Decrease Percents of Increase and Decrease **Additional Activities** Math Menu Self-Checking Sheets Digital Escape Room Percent Proportion Pixel Art	
Use multi-step applications involving tax, discount, interest, gratuity, commission and simple interest		**EdGems - Lesson 5.4** Climb the Ladder Masterpiece **Additional Activities** Escape Room Self-Checking Sheets Digital Choice Board Boom Cards Jam	

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		Instructional Adjustments: Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative Edpuzzle Quizizz Nearpod	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook **Common Misconceptions:** ● Students may not recognize which part of the problem they are solving for and incorrectly set up the proportion. ● Students may struggle to read a problem and to determine which information is the part and/or the whole. ● Students may struggle with percent increase and decrease problems by forgetting to do any additional calculations.

Unit 7: Radicals and Exponent Properties	
Essential Questions	**Enduring Understandings**
- How can you simplify expressions using exponents? - How can measurements involving very large and very small numbers be made easier to use and compare? - How do you recognize a perfect square? - How can you simplify a non-perfect square? - How can you use Pythagorean Theorem to solve problems?	- Exponents can be extended to include zero and negative exponents. - Exponent expressions with the same base can be simplified using properties of exponents. - Properties of exponents allow expressions in which powers raised to a power or quantities raised to a power can be simplified. - Scientific notation is used to make it easier to read, write, and calculate extremely large or small numbers. - Calculations with numbers in scientific notation follow the properties of exponents. - The Pythagorean Theorem and its converse is used to find missing side lengths of a right triangle and determine if a triangle is right.

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Use properties of exponents to simplify expressions involving multiplication.	**CCSS 8.EE.1:** Know and apply the properties of integer exponents to generate equivalent numerical expressions.	**EdGems - Lesson 12.1** Ticket Time **Additional Activities** Discovery Activity Two Truths and a Lie	Students will be formatively assessed through: - Teacher Observations - Do Nows - Exit Slips - Classwork - Extended Learning Activities - Stations - Educational Games Summative assessments include: - Minor Assessments - Major Assessments - Performance Assessments
Use properties of exponents to simplify expressions involving division.		**EdGems - Lesson 12.2** MATHO Partner Math Simplifying Expressions **Additional Activities** Two Truths and a Lie Spilled Math	

Pre-Algebra

		Exponent Rules MathLib	
Express numbers in scientific notation and standard notation	**CCSS 8.EE.3:** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.	**EdGems - Lesson 12.3** Always, Sometimes, Never **Desmos** The Solar System, Test Tubes, and Scientific Notation Balance the Scale **Additional Activities** Which one doesn't belong? Whodunnit?	
Compute with numbers in scientific notation.	**CCSS 8.EE.4:** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for sea floor spreading). Interpret scientific notation that has been generated by technology	**EdGems - Lesson 12.4** Climb the Ladder Partner Math Relay Masterpiece **Additional Activities** Comparing Populations Maze	
Recognize perfect squares and perfect cubes and find the values of square roots and cube roots.	**CCSS 8.EE.2:** Use square root and cube root symbols to represent solutions to equations of the form $x2 = p$ 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. Know that 2 is irrational. **CCSS 8.NS.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	**EdGems - Lesson 7.4** Climb the Ladder Partner Math Relay Ticket Time **Desmos** Square Dance **Additional Activities** Perfect Squares Sort Cube Root Maze Maze Practice Slides	

Pre-Algebra

	expansion which repeats eventually into a rational number.	Picture Reveal	
Use roots to solve equations with exponents.	**CCSS 8.NS.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., π2).	**EdGems - Lesson 7.5** MATHO **Additional Activities** Khan Academy	
Simplify square roots and cube roots.		**EdGems - Lesson 7.6** Stations Ticket Time **Additional Activities** Picture Reveal Card Match Simplifying Radicals Slides Simplifying Radicals Puzzle Simplifying Radicals Pixel Art	
Use the Pythagorean Theorem to find missing side lengths in right triangles.	**CCSS 8.G.6:** Explain a proof of the Pythagorean Theorem and its converse. **CCSS 8.G.7:** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	**Desmos** Pythagorean Theorem and Finding Missing Side Lengths Pythagorean Theorem and Madden Football Taco Cart **Additional Activities** Practice Slides Application Slides Drag & Drop Self-Checking Sheets Pixel Art Mazes	

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		Instructional Adjustments: Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative Edpuzzle Quizizz Nearpod	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook **Common Misconceptions:** ● When multiplying two expressions which have coefficients, students may try to add the coefficients since they are adding the exponents of like bases. ● Students may have trouble making sense of why any value to the 0 power is 1. ● Students may struggle with trying to remember what it means for an expression to be written in "simplest form" ● The answer of a square root is both negative and positive. ● When estimating a square root, some students struggle in determining what integers it lies between. ● Students may try to divide both sides by the value of the exponent rather than taking the square root or cube root.

Unit 8: Geometry	
Essential Questions	**Enduring Understandings**
- How to best describe relationships between the angles formed by intersecting lines? Are some relationships more useful than others in certain situations? - By definition, what is a circle? - How are the formulas for surface area and volume for prisms and cylinders derived? - How can three dimensional objects be measured? Are there some measurements that are more useful in specific situations than others?	- Angle relationships are characterized by their measures. They can occur in pairs such as adjacent, complementary, supplementary and vertical. - A circle is a "set of points" each equidistant from a fixed point - the center - that all lie in the same plane. The radius determines the length of the diameter, circumference, and the area all of which can be used to describe the size of a circle. - The formulas for surface area derive from the sum of the bases of the shape while the formula for volume is the area of the two-dimensional base multiplied by the height of the object.. - Three-dimensional figures can be measured by their surface area and volume. Surface area is more useful when you want to know how much of the surface of the figure you can cover. Volume is more useful when you want to know how much space it takes up or how much space is inside it.

Core Content		Instructional Actions	
Objectives	**Alignment to NJSLS**	**Recommended Activities/Strategies**	**Assessment Check Points**
Classify pairs of angles as supplementary, complementary, adjacent, or vertical. Solve problems involving supplementary, complementary, adjacent or vertical angles.	**CCSS 7.G.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.	**EdGems - Lesson 8.1 and 8.2** Climb the Ladder Partner Math Ticket Time **Desmos** Supplementary and Complementary Angles Complementary / Supplementary / Adjacent Angles Polygraph Angle Relationships	Students will be formatively assessed through: - Teacher Observations - Do Nows - Exit Slips - Classwork - Extended Learning Activities - Stations - Educational Games Summative assessments include: - Minor Assessments - Major Assessments

			● Performance Assessments
		Additional Activities Pixel Art Maze Complementary & Supplementary Maze Angles & Parallel Lines Coloring	
Solve problems involving the area of basic polygons.	**CCSS 7.G.6:** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons	**EdGems - Lesson 8.4** MATHO **Desmos** Equal Areas **Additional Activities** Self-Checking sheets	
Identify parts of a circle. Solve problems that involve the circumference of a circle. Relate the circumference of a circle to its area. Solve problems that involve the area of a circle.	**CCSS 7.G.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.	**EdGems - Lesson 8.5 and 8.6** Task Rotation Masterpiece **Desmos** Pi & Circumference Area of Circles Sector Area **Additional Activities** Maze Complete the table	
Solve problems involving the area of composite figures.	**CCSS 7.G.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.	**EdGems - Lesson 8.7** Climb the Ladder Relay **Desmos** Angle Relationships **Additional Activities** Drag & Drop Self-Checking Sheets	

Use nets to visualize the multiple surfaces of three-dimensional prisms and pyramids. Apply understanding of surface area to solve real-world word problems.	**CCSS 8.G.9:** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	**EdGems - Lesson 10.2 and 10.3** Ticket Time Masterpiece **Desmos** Prisms & Surface Area Surface Area Geogebra **Additional Activities** Gift Wrapping
Solve problems involving the volume of prisms and cylinders. Apply understanding of volume to solve real-world word problems..		**EdGems - Lesson 10.4 and 10.5** Climb the Ladder Stations Task Rotation Partner Math **Desmos** Volume of Prisms Cylinders **Additional Activities** Cut & Paste Matching Pixel Art

Pre-Algebra

Resources: Essential Materials, Supplemental Materials, Links to Best Practices		Instructional Adjustments: Instructional Adjustments: Modifications, Student Difficulties, Possible Misunderstandings
Supplemental Resources: EdGems Math - Course 2 Accelerated Teacher Gems PD Overview http://www.socrative.com/ www.kahoot.it www.shodor.org www.Insidemathematics.org www.xyzsolve.com www.ck12.org www.mathjong.com Pear Deck Socrative Edpuzzle Quizizz Nearpod	**Resources from textbook:** ● Lesson Presentations ● Lesson Videos ● Explore Activities ● Online Practices ● Exit Cards ● Tiered Practices ● Performance Tasks ● Unit Reviews ● Assessments	**Emphasize note taking strategies:** ● Use guided notes when necessary ● Revisit and study notebook ● Create vocabulary notecards ● Use tools/manipulatives/models ● Reword application problems ● Use handouts/graphic organizers ● Review peer work and provide feedback ● Complete error analysis process. ● Use Google Apps for Education ● Create a study guide for intervention ● Build a glossary notebook **Common Misconceptions:** ● The difference between area and perimeter and correct units for each. ● Drawing a picture to help solve word problems involving area. ● The difference between the radius and diameter. ● Using nets to visualize and label each face of a three-dimensional shape before calculating the surface area. ● The base of a prism must be two congruent parallel polygons, one on the top and one on the bottom.