

PUBLIC SCHOOLS OF EDISON TOWNSHIP
OFFICE OF CURRICULUM AND INSTRUCTION

Grade 7 Mathematics

Length of Course: Term
Elective/Required: Required
Schools: Middle Schools
Eligibility: Grade 7
Credit Value: N/A
Date Approved: August 26, 2019

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****Sections 7.5, 10.6 and 10.7 as well as units 9, 12 and 13 should be taught at the teacher's discretion and if time allows.**

INTRODUCTION

The New Jersey Student Learning Standards for Mathematics are intended to provide students with a solid foundation. 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: *(Refer to Instructional Actions Column on Guide - Recommended Activities/Strategies, Assessment Check points and Resources)*

National / International Technology Student Standards

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: *(Refer to Instructional Actions Column on Guide - Recommended Activities/Strategies)*

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. Use technology to enhance productivity.

SCOPE & SEQUENCE

MARKING PERIOD 1:Unit 1 Ratios and Rates

Ratios
 Unit Rates
 Rates and Ratios with Complex Fractions
 Scale Drawings

Unit 2 Sums and Differences of Rational Numbers

Adding Integers
 Adding Rational Numbers
 Subtracting Integers
 Subtracting Rational Numbers

Unit 3 Products and Quotients of Rational Numbers

Multiplying and Dividing Integers
 Multiplying Rational Numbers
 Dividing Rational Numbers
 Order of Operations

MARKING PERIOD 2:Unit 4 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 5 Percents

Fractions, Decimals and Percents
 Percent of a Number
 Percent of Change
 Percent Applications

MARKING PERIOD 3:Unit 6 Algebraic Expressions

Algebraic Expressions
 The Distributive Property
 Equivalent Expressions

Unit 7 Equations and Inequalities

Solving One and Two Step Equations
 Solving Multi-Step Equations
 Solutions to Linear Equations
 Square Roots
 Simplifying Roots
 Linear Inequalities

MARKING PERIOD 4:Unit 8 Two-Dimensional Geometry

Complementary and Supplementary Angles
 Vertical Angles and Adjacent Angles
 Drawing Triangles with Given Conditions
 Areas of Polygons
 Circumference and Pi
 Area of a Circle
 Composite Figures

Unit 10 Three-Dimensional Geometry

Three-Dimensional Figures
 Surface Area of Prisms
 Surface Area of Pyramids
 Volume of Prisms
 Volume of Cylinders

Unit 11 Probability and Statistics

Probability
 Using Probability to Predict
 Compound Probability
 Random Sampling and Inferences
 Measures of Center and Variability in Two Data Sets

UNIT 1: Ratios and Rates

Extend students' understanding of and ability to apply Ratios and Proportional Relationships with an emphasis on rates.

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • What is a 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? • What is a fraction of a fraction? • How can you scale objects? Why is this useful? 	<ul style="list-style-type: none"> • 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. • An object may need to be dilated using a scale factor in order to prove two figures are similar.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSL:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> • 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. 	<p>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. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.</p>	<p>Lesson Presentations</p> <p>Online Practice</p> <p>Explore! Activity: Wildflower Fun</p> <p>Teacher Gem: Climb the Ladder</p> <p>Paper Pool - Students deepen their understanding of proportions and ratios.</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> • Leveled Worksheets • Focused Assignments • Exit Cards • Tiered Assessments • Assessments <p>Focused Assignment: Exercises 1-15 odd, 16-18, 20, 22 1.2</p>	<p>Student Gems for each section provides online resources to support the lessons</p> <p>Click Battle</p> <p>Gas Station Ripoff</p> <p>Aquarium</p> <p>Equal Ratios</p>

<ul style="list-style-type: none"> ● Identify rate and create a definition for unit rate. ● Apply concept of unit rate to problem solve. ● Compute unit rates with ratios made up of fractions. <ul style="list-style-type: none"> ● Compute lengths and areas of scaled drawings from actual figures. ● Compute scale factor when given an actual figure and a scale drawing. ● Compute lengths and areas of actual figures from scale drawings. 	<p>7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>	<p>Explore! Activity: Find the Best Deal</p> <p>Teacher Gem: Ticket Time</p> <p>Explore! Activity: A Change of Pace</p> <p>Teacher Gems: MATHO, Partner Math, Stations</p> <p>Explore! Activity: Enlarge or Reduce</p>	<p>Performance Task: Fizzy Lemonade</p> <p>Focused Assignment: 1-23 odd</p> <p>Performance Task: Bike Race</p> <p>Focused Assignment: Exercises 1-13 odd, 16, 19-21</p> <p>Gem Challenge</p> <p>Performance Task: Tamara's House</p> <p>Focused Assignment: Exercises 1-15 odd, 18-20 Gem Challenge</p>	<p>What are Rates and Unit Rates?</p> <p>Khan Academy - Rates with Fractions</p> <p>How do you solve a scale model problem?</p> <p>IXL - Scale Factor & Classification</p> <p>Scaling Pictures</p> <p>Khan Academy - Scale Drawings</p> <p>Scale Ella</p> <p>Illustrative Mathematics - Floor Plan</p>
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Instructional Adjustments:

Modifications/Student difficulties/Common errors

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- Leaving fractions as improper fractions when writing ratios so they can see the comparison of the two numbers.
- It may be more efficient to write mixed numbers as improper fractions before they are used in a complex fraction. .
- **Vocabulary:** complex fraction, corresponding sides, equivalent ratio, ratio, reciprocal, scale, scale drawing, scale factor, tape diagram, unit rate

UNIT 2: Sums and Differences of Rational Numbers

Expand students' understanding of and conceptual understanding of the Number System involving rational numbers with an emphasis on sums and differences of rational numbers.

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • What are the types of rational numbers? What kinds of problems can be solved by adding/subtracting the different types of rational numbers? • How do we add rational numbers with different signs? The same signs? • How do we subtract rational numbers with different signs? The same signs? 	<ul style="list-style-type: none"> • 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.. • Repeated addition can represent the operation of multiplication which can also be modeled on a number line.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLs:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	

<ul style="list-style-type: none"> Express the distance between numbers on the number line as the absolute value of their difference. Combine opposite quantities to make zero. Add integers with same signs. Add integers with different signs. Interpret sums of rational numbers. Relate the addition of rational numbers to the number line. Apply additive inverses to solve subtraction problems. Subtract integers. Subtract rational numbers. Solve real world problems by adding and subtracting rational numbers. 	<p>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. a. Describe situations in which opposite quantities combine to make 0. b. 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. c. 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. d. Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	<p>Lesson Presentations</p> <p>Online Practice</p> <p>Explore! Activity: Integer Chips</p> <p>Teacher Gem: Climb the Ladder</p> <p>Explore! Activity: Moving Makes Easy</p> <p>Teacher Gem: MATHO</p> <p>Explore! Activity: Number Line Subtraction</p> <p>Teacher Gem: Four Corners</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments <p>Focused Assignment: Exercises 1-17 odd, 22 - 27, 32, 35</p> <p>Focused Assignment: Exercises 3-27 multiples of 3</p> <p>Performance Task: Can it Be</p> <p>Focused Assignment: Exercises 1 - 19 odd, 20-26, 28-30, 36</p> <p>Performance Task:</p>	<p>Student Gems for each section provides online resources to support the lessons</p> <p>Adding Integers</p> <p>Hot Air Balloon</p> <p>Adding & Subtracting Fractions on a Number Line</p> <p>IXL - Adding & Subtracting Rational Numbers</p> <p>IXL - Adding & Subtracting Integers</p> <p>Illustrative Mathematics - Comparing Freezing Points</p>
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Explore! Activity: What's the Difference?
Teacher Gems: Partner Math, Categories, Always, Sometimes, Never, and Relay

Low Temperatures
Focused Assignment:
Exercises 1 - 29 odd

Gem Challenge

Instructional Adjustments:

Modifications/Student difficulties/Common errors

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- Utilizing number lines or integer chips to model their integer computations and ensure conceptual understanding.
- Absolute value is always positive because it represents a distance.
- A negative sign and a subtraction sign represent the same thing.
- **Vocabulary**: absolute value, additive inverses, integer, negative number, opposite, positive number, rational number

UNIT 3: Expand students' understanding of and conceptual understanding of the Number System involving rational numbers with an emphasis on products and quotients of rational numbers.

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • Which models and relationships help make sense of multiplying and dividing positive and negative rational numbers? • When multiplying and dividing rational numbers, how do you determine the sign? 	<ul style="list-style-type: none"> • The inverse operations of multiplication and division establish a pattern for the products and quotients. • Multiplication can be represented as repeated addition which can be modeled on a number line. • Multiplication and division are inverse operations and therefore the pattern for the signs of products equates to the pattern for the signs of quotients.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLS:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	

<ul style="list-style-type: none"> Solve problems involving multiplication of rational numbers. Interpret products of rational numbers. Solve problems involving the division of rational numbers. Interpret quotients of rational numbers. Solve numerical problems with rational numbers by using the four operations. Solve word problems that involve rational numbers and the four 	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>a. 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.</p> <p>Interpret products of rational numbers by describing real-world contexts.</p> <p>b. 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 $-\frac{p}{q} = \frac{(-p)}{q} = \frac{p}{(-q)}$</p> <p>c. Interpret quotients of rational numbers by describing real-world contexts. c. Apply properties of</p>	<p>Lesson Presentations</p> <p>Online Practice</p> <p>Explore! Activity: Number Jumping</p> <p>Teacher Gems: Always, Sometimes, Never, Stations</p> <p>Explore! Activity: Integer Games</p> <p>Teacher Gem: Relay</p> <p>Explore! Activity: Three Strategies</p> <p>Teacher Gems: Ticket Time, MATHO, Masterpiece, Climb the Ladder</p> <p>Explore! Activity: Positive or Negative?</p> <p>Teacher Gem: Task Rotation</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments <p>Focused Assignment: Exercises 1 - 27 odd, 28 - 33, 43</p> <p>Focused Assignment: Exercises 1 - 17 odd, 20 - 24, 28</p> <p>Focused Assignment: Exercises 1 - 17 odd, 21, 24, 25</p> <p>Performance Task: Car Shopping</p> <p>Gem Challenge</p> <p>Focused Assignment: Exercises 1 - 8, 13 - 23 odd, 27, 30</p> <p>Performance Task: Chocolate Profits</p>	<p>Student Gems for each section provides online resources to support the lessons</p> <p>Multiplying Integers Investigation</p> <p>Khan Academy - Dividing mixed numbers with negatives</p> <p>Illustrative Mathematics - Drill Rig</p> <p>Khan Academy - Order of Operations with negative numbers</p>
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operations.

operations as strategies to multiply and divide rational numbers.
7.NS.3 (Major Standard) Solve real-world and mathematical problems involving the four operations with rational numbers.

Instructional Adjustments:

Modifications/Student difficulties/Common errors

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- A fraction bar represents division.
- A negative sign in front a fraction can be moved to either the numerator or denominator.
- **Vocabulary**: base, exponent, inverse operations, order of operations, power, squared

UNIT 4: Proportional Relations and Linear Functions**Extend students comprehension of proportional relationships in terms of linear functions**

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • What is a proportional relationship? How can proportional relationships be used to model real world situations? • What is the constant of proportionality? How can you distinguish relationships that are proportional from relationships that are not proportional? • What is slope? • How can the slope and the y-intercept be used to graph and write linear equations? 	<ul style="list-style-type: none"> • All proportional relationships are linear equations, but not all linear equations are proportional. • That slope is the rate of change between any two points. • Linear equations can be represented by equations and on graphs.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLS:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	

<ul style="list-style-type: none"> Determine if ratios form a proportion and solve for a missing value in a proportion. Solve problems by writing and solving proportions 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. 	<p>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</p> <p>7.RP.3: Use proportional relationships to solve multi-step ratio and percent problems.</p> <p>7.RP.2b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>7.RP.2c: Represent proportional relationships by equations.</p> <p>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.</p>	<p>Lesson Presentations</p> <p>Explore! Activity: Are you My Equal</p> <p>Teacher Gem: MATHO</p> <p>Explore! Activity: Cookies</p> <p>Teacher Gem: Task Rotations</p> <p>Explore! Activity: Real-World Graphs</p> <p>Teacher Gem: Relay</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments <p>Focused Assignment: Exercises 1-23 odd, 26, 28</p> <p>Performance Task: Candy Shop</p> <p>Focused Assignment: Exercises 1-19 odd, 21-23</p> <p>Performance Task: Fruit Baskets</p> <p>Focused Assignment: Exercises 1-11 odd, 14-17, 21-22</p>	<p>Student Gems for each section provides online resources to support the lessons</p> <p>Equal Ratios</p> <p>On Your Mark</p> <p>Marcellus the Giant</p> <p>Math Mess</p> <p>Proportional Graphs</p> <p>The Running Game</p> <p>Practice Ratios and Proportions</p> <p>IXL: Graphing Proportional Relationships</p>
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<ul style="list-style-type: none">• Use slope triangles to find the slope of lines. <ul style="list-style-type: none">• Find the slope of a line using the slope formula	<p>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.</p> <p>8.EE.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.</p>	<p>Explore! Activity: Slope Triangles</p> <p>Teacher Gem: Climb the Ladder</p> <p>Explore! Activity: Find That Formula</p> <p>Teacher Gem: Partner Math</p>	<p>Performance Task: How Steep Is It?</p> <p>Focused Assignment: Exercises 1-9, 14-20</p> <p>Focused Assignment: Exercises 1-15 odd, 18, 21, 24</p>	<p>Investigating Slope</p> <p>Put the Point on the Line</p> <p>Space Invaders Slope</p> <p>Graphing Lines</p> <p>Khan Academy: Graphing Proportional Relationships</p> <p>Similar Triangles and Slope</p> <p>Stairway Slope</p> <p>Slope between Two Points of a Line</p> <p>IXL: Rate of Change</p> <p>Polygraph Lines</p>
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<ul style="list-style-type: none">• Graph linear equations in slope-intercept form. • Write Linear Equations for a given graph.		<p>Explore! Activity: Vertical Intercepts</p> <p>Teacher Gem: Four Corners</p> <p>Explore! Activity: Find the Equation</p> <p>Teacher Gem: MATHO</p>	<p>Performance Task: Real- World Models</p> <p>Focused Assignment: Exercises 1-19 odd, 20, 24</p> <p>Focused Assignment Exercises 1-15 odd, 18, 20</p>	<p>Rate of Change from an Equation</p> <p>Exploring $y=mx+b$</p> <p>IXL: Graph the Line</p> <p>Slope Intercept Stars</p> <p>Charge</p> <p>Lego Prices</p> <p>IXL: Interpret the graph of a Linear Function</p> <p>Investigating Offers</p>
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Instructional Adjustments:*Modifications/Student difficulties/Common errors*

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- Proper understanding of the coordinate plane...ordered pairs, the quadrants, x and y axes and how they are numbered (not always by ones)
- **Vocabulary**: proportional relationship, constant of proportionality, proportion, linear functions, slope, slope intercept form

UNIT 5: Percents

Extend students' comprehension of percents emphasizing proportional relationships and applying concepts to real world applications

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> Do other numbers exist besides rational numbers? Why are they necessary? How can understanding proportions help solve multi-step problems that involve proportional relationships? 	<ul style="list-style-type: none"> Fractions can be written as decimals some of which are non-repeating, non-terminating decimals called irrational numbers. Knowing when relationships are proportional.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLs:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> Connect the different forms of rational numbers (percents, fractions and decimals). 	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.	Lesson Presentations Online Practice Explore! Activity: Fractions and Decimals Teacher Gems: Categories MATHO Partner Math	EdGems.com <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments Focused Assignment: Exercises 1-33 odd Gem Challenge	Student Gems for each section provides online resources to support the lessons. Fraction, Decimal, Repeat Card Sort: The Whole Enchilada Khan Academy: Comparing and Ordering Rational Numbers Khan Academy: Converting Fractions to Decimals

<ul style="list-style-type: none"> Apply an understanding of percent as a ratio to 100 to solve for the part, whole or the percent. Find the solution to multi-step ratio word problems Solve problems involving percent change Solve problems involving the percent error when given a real-world scenario Use multi-step applications involving tax, discount, interest, gratuity, commission and simple interest 	<p>7.RP.3: Use proportional relationships to solve multi-step ratio and percent problems.</p>	<p>Explore! Activity: Flooring Sale</p> <p>Teacher Gem: Stations</p> <p>Explore! Activity: Minimum Wage</p> <p>Teacher Gem: Relay</p> <p>Explore! Activity: Take-Out Totals</p> <p>Teacher Gem Activities: Ticket Time Masterpiece Task Rotations Climb the Ladder Masterpiece</p>	<p>Focused Assignment Exercises 1-11 odd, 13-17, 21, 22</p> <p>Task Performances: www.insidemathematics.org</p> <p>Focused Assignment Exercises 1-13 odd, 14-16, 18-19, 22-23</p> <p>Performance Task: Commission</p> <p>Focused Assignment Exercises 1-15 odd, 18-22, 27</p> <p>Gem Challenge</p> <p>Performance Task: Computer Sale</p>	<p>Graduation - 3 Act Task</p> <p>Special Offer</p> <p>Dan Meyer 3 Act Task: Dueling Discounts https://docs.google.com/spreadsheets/d/1jXSt_CoDzyDFeJimZxnhgwOVsWkTQEsfqouLWNNC6Z4/edit#gid=0</p>
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				Percent Application Problems (Desmos)
Instructional Adjustments: <i>Modifications/Student difficulties/Common errors</i> Appropriate accommodations and/or modifications as determined by 504's and IEP's: shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc. Ask students to restate information, directions, and assignments. Emphasize: <ul style="list-style-type: none">• Different forms of a percent i.e. 7%, 0.07 or 1.07• Understanding what a proportional relationship is• Using proportions vs multiplying when finding tax, tip and discount• <u>Vocabulary</u>: Terminating decimals, repeating decimals, percent change, percent increase, percent decrease, markup, discount, commission, gratuity, sales tax, interest, principal				

[Khan Academy: Percent Application Problems](#)[Simple Interest](#)

UNIT 6: Algebraic Expressions**Extend students' understanding of Expressions involving rational numbers to problem solve**

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • Numerical and algebraic expressions can be simplified/evaluated using order of operations and computation of rational numbers.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSL:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> • Translate and write algebraic expressions. • Evaluate algebraic expressions. • Use the Distributive Property to write equivalent 	<p>6.EE.2: Write, read and evaluate expressions in which letters stand for numbers.</p> <p>7EE.1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with</p>	<p>Explore! Activity: Formula Frenzy</p> <p>Teacher Gem Activity: Stations</p> <p>Explore! Activity: Factoring Fun</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> • Leveled Worksheets • Focused Assignments • Exit Cards • Tiered Assessments • Assessments <p>Focused Assignment Exercises 1-23 odd, 26-28</p> <p>Focused Assignment Exercises 1-27 odd</p> <p>Performance Task:</p>	<p>Student Gems for each section provides online resources to support the lessons.</p> <p>IXL: Writing Expressions</p> <p>Khan Academy: Writing Expressions</p> <p>Distributive Property</p> <p>Understanding the</p>

<p>expressions.</p> <ul style="list-style-type: none"> Simplify expressions using the Distributive Property and combining like terms. 	<p>rational coefficients.</p> <p>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.</p> <p>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.</p>	<p>Teacher Gem Activity: Ticket Time</p> <p>Explore! Activity: “Where Do I Belong?”</p> <p>Teacher Gems: Partner Math MATHO Always, Sometimes, Never Ticket Time Categories</p>	<p>Smart Shopper</p> <p>Focused Assignment Exercises 1-23 odd</p> <p>Performance Task: In Terms of X</p>	<p>Distributive Property</p> <p>Padlet</p> <p>Expressions Bundle</p> <p>Khan Academy:Equivalent Expressions</p> <p>IXL: Equivalent Expressions</p> <p>Burgers and Fries</p> <p>Math Magic</p> <p>Khan Academy: Interpreting Linear Expressions</p> <p>Picture Perfect</p> <p>Pool Border</p>
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Instructional Adjustments:

Modifications/Student difficulties/Common errors

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- **Vocabulary**: variable, algebraic expression, evaluate, term, constant, coefficient, equivalent expressions, factoring, like terms

UNIT 7: Equations and Inequalities**Extend students' understanding of Expressions and Equations involving rational numbers to problem solve.**

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLs:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> • Solve one and two step equations by simplifying and 	7.EE.4a: Solve word problems leading to	Teacher Gem Activity: Climb the Ladder	EdGems.com <ul style="list-style-type: none"> • Levelled Worksheets 	Student Gems for each section provides online
<p>Instructional Adjustments: <i>Modifications/Student difficulties/Common errors</i></p> <p>Appropriate accommodations and/or modifications as determined by 504's and IEP's: shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.</p> <p>Ask students to restate information, directions, and assignments.</p> <p>Emphasize:</p> <ul style="list-style-type: none"> • Students might want to test their answer to make sure it is a solution to the equation or inequality • Emphasize the difference between an open and closed circle of an inequality • Vocabulary: equation, solution, distributive property, perfect square, square root, irrational numbers, cube root, perfect cube, prime factorization, inequality, solution set 				

UNIT 8: Two-Dimensional Geometry

Expand students' understanding of Geometry to incorporate constructions, circles, angles and area with a strong emphasis on real world application.

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> How to best describe relationships between the angles formed by intersecting lines? Are some relationships more useful than others in certain situations? Without measuring tools, how can the side lengths are of a right triangle be deduced? How can it be determined that a triangle is a right triangle? By definition, what is a circle? 	<ul style="list-style-type: none"> Angle relationships are characterized by their measures. They can occur in pairs such as adjacent, complementary, supplementary and vertical. Needed information to draw a unique figure includes: side lengths or height of the figure, the relationship of the sides to each other, angle relationships and the direction the figure is facing. 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.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLs:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> Classify pairs of angles as supplementary, complementary, adjacent, or vertical. Solve problems involving supplementary, complementary, adjacent or vertical angles. 	<p>7.G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p>	<p>Lesson Presentations</p> <p>Online Practice</p> <p>Explore! Activity: Complementary vs Supplementary</p> <p>Teacher Gem: Climb the Ladder</p> <p>Explore! Activity: The Vertical Angle Relationship</p> <p>Teacher Gems:: Ticket</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments <p>Focused Assignment: Exercises 1 - 25 odd, 26</p> <p>Focused Assignment:</p>	<p>Finding Unknown Angles</p> <p>IXL - Identify complementary, supplementary, vertical, adjacent, and congruent angles</p> <p>Angle Relationships: Complementary, Supplementary, Vertical, and Adjacent</p>

<ul style="list-style-type: none"> • Understand attributes of triangles. • Construct triangles using the appropriate tools. • Identify unique and non-unique triangles. • Solve problems involving the area of basic polygons. • 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. • Solve problems involving the area of composite figures. 	<p>7.G.A.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one</p> <p>7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p> <p>7.G.B.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.</p>	<p>Time, Partner Math, MATHO</p> <p>Explore! Activity: Knowing Three Measures</p> <p>Teacher Gems: Ticket Time, Always, Sometimes, Never and Categories</p> <p>Explore! Activity: A Formula for Trapezoid Area</p> <p>Teacher Gem: MATHO</p> <p>Explore! Activity: A Special Ratio</p> <p>Teacher Gem: Task Rotations</p> <p>Explore! Activity: Circle Areas</p> <p>Teacher Gem: Masterpiece</p>	<p>Exercises 1 - 15 odd, 18, 20</p> <p>Performance Task: Angle Types</p> <p>Gem Challenge</p> <p>Focused Assignment: Exercises 1 - 17 odd, 20 - 24</p> <p>Performance Task: Triangle Frames</p> <p>Gem Challenge</p> <p>Focused Assignment: Exercises 1 - 17 odd, 20, 22, 25</p> <p>Focused Assignment: Exercises 1 - 10 all, 15 - 23 odd</p> <p>Performance Task: Friendship Bracelet</p> <p>Focused Assignment: Exercises 1 - 5, 9 - 13, 17, 22</p>	<p>Learn Zillion - Draw Geometric Shapes with given conditions</p> <p>Triangle Maker</p> <p>Investigating Congruent Triangles</p> <p>Circumference of Circles</p> <p>Relationships between a circle's diameter and circumference</p> <p>Pizza Crusts</p> <p>Areas of Composite Shapes and Circumference</p>
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		Explore! Activity: Composing Figures Teacher Gems: Climb the Ladder, Relay	Performance Task: Volleyball Cakes Focused Assignment: Exercises 1 - 19 odd Performance Task: Canvas Painting Gem Challenge	
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Instructional Adjustments:

Modifications/Student difficulties/Common errors

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- 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.
- **Vocabulary:** adjacent angles, angle, area, center, central angle, chord, circle, circumference, complementary angles, composite figure, degrees, diameter, linear pair, pi, polygons, protractor, radius, ray, secor, supplementary angles, trapezoid, vertex, vertical angles

UNIT 10: Three-Dimensional Geometry

Expand students' understanding of Geometry to understand relationships between two- and three-dimensional figures, surface area, and volume with a strong emphasis on real world application.

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> 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? 	<ul style="list-style-type: none"> 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.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLs:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> Describe the two-dimensional figure that results from slicing three-dimensional figures. Use nets to visualize the multiple surfaces of three- 	<p>7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p>	<p>Lesson Presentations</p> <p>Online Practice</p> <p>Explore! Activity: Cutting Clay</p> <p>Teacher Gems: Partner Math, Always, Sometimes, Never and Four Corners</p> <p>Explore! Activity: Take Your</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments <p>Focused Assignment: Exercises 1-12, 16-21, 28</p> <p>Gem Challenge</p> <p>Focused Assignment:</p>	<p>Slicing three-dimensional figures</p> <p>3D shapes into 2D objects</p> <p>Cross Sections</p> <p>Interactives - Surface Area of Prisms</p> <p>Nets & Surface Area:</p>

<p>dimensional prisms and pyramids.</p> <ul style="list-style-type: none"> Apply understanding of surface area to solve real-world word problems. <ul style="list-style-type: none"> Solve problems involving the volume of prisms and cylinders. <ul style="list-style-type: none"> Apply understanding of volume to solve real-world word problems.. 	<p>7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p> <p>8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.</p>	<p>Pick</p> <p>Teacher Gem: Ticket Time</p> <p>Explore! Activity: Tent Making</p> <p>Teacher Gem: Masterpiece</p> <p>Explore! Activity: Pyramid vs. Prism</p> <p>Teacher Gems: Climb the Ladder, Stations, Task Rotation</p> <p>Explore! Activity: Volume of Cylinders</p> <p>Teacher Gem: Partner Math</p>	<p>Exercises 1- 3, 7-9, 13, 17</p> <p>Performance Task: Fold, Form and Halve</p> <p>Focused Assignment: Exercises 1 - 11 odd, 12, 16, 18</p> <p>Focused Assignment: Exercises 1-9 odd, 12-15, 20</p> <p>Performance Task: Candles in a Box</p> <p>Gem Challenge</p> <p>Focused Assignment: Exercises 3-21 multiples of 3</p>	<p>Rectangular Prisms</p> <p>Interactives - Volume of Cylinders</p> <p>Pack it Up! Will it fit?</p>
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Instructional Adjustments:

Modifications/Student difficulties/Common errors

Appropriate accommodations and/or modifications as determined by 504's and IEP's:

shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- 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 polygons, one on the top and one on the bottom.
- **Vocabulary**: base, cross section, cylinder, edge, face, lateral face, net, prism, pyramid, slant height, solid, surface area, vertex, volume

UNIT 11: Probability and Statistics

Expand students' knowledge of Statistics and Probability to include making inferences about populations and probability models as well as apply concepts to real world application.

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> Suppose you want to know the characteristics of a large group of people or things. How can you make conclusions about the entire group without checking every member of the group? Suppose you want to compare the characteristics of two groups of people or things. How can you draw conclusions about the groups without checking every member of each group? How do you measure probability? Can probability be used to predict future events? How confident can you be in your predictions? How do you measure the probability of more than one event? 	<ul style="list-style-type: none"> Collecting a representative sample of a larger group - population - you are studying, valid inferences about the entire group. If the researcher writes a clear statistical question, he or she can properly divide the entire population into multiple groups. The probability of an event can be described on a scale from impossible to certain using words or a number. You can use theoretical or experimental probability to determine how likely an event is to occur and make decisions about how often the event will occur in a related situation. If more than one event is involved, probability can be found by representing the sample space for compound events using a variety of methods (tree diagrams, tables, organized lists, and simulations). Theoretical probability can be used to find the relative likelihood of multiple events to see which event is most likely.

Content		Instructional Actions		Resources – (Technology)
<u>Objectives:</u>	<u>Alignment to NJSLs:</u>	<u>Recommend Activities/Strategies:</u>	<u>Assessment Check Points:</u>	
<ul style="list-style-type: none"> Describe the likelihood of chance events as impossible, likely, unlikely, or certain. Understand that all probabilities are represented by a number from 0 to 1. Know that the probability of an unlikely event is closer to 0 and a likely event is closer to 1. 	<p>7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</p>	<p>Lesson Presentations</p> <p>Online Practice</p> <p>Explore! Activity: Coin Flip</p> <p>Teacher Gems: Partner Math, Ticket Time, Masterpiece, Stations</p> <p>Gem Challenge</p>	<p>EdGems.com</p> <ul style="list-style-type: none"> Leveled Worksheets Focused Assignments Exit Cards Tiered Assessments Assessments 	<p>IXL - Experimental Probability</p> <p>Khan Academy - Simple Probability</p>

<ul style="list-style-type: none"> Understand that the sum of the probabilities of all possible outcomes is equal to 1. Calculate simple probabilities. Predict an outcome using experimental and theoretical probability. Calculate probabilities of compound events. Identify the sample space for a compound event. Represent the sample space for a compound event in the form of a list, table, or diagram. Make inferences about a population using data from random samples. Numerically compare sample data from two populations using measures of center and variability. 	<p>7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</p> <p>7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.</p> <p>7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p> <p>7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support</p>	<p>Explore! Activity: Capture/Recapture</p> <p>Teacher Gems: MATHO, Relay</p> <p>Gem Challenge</p> <p>Explore! Activity: Three Sports</p> <p>Teacher Gems: Task Rotation, Four Corners, Climb the Ladder</p> <p>Gem Challenge</p> <p>Explore! Activity: Favorite Color</p> <p>Teacher Gems: Always, Sometimes, Never and Task Rotations</p> <p>Gem Challenge</p>	<p>Focused Assignment: Exercises 1-13 odd, 15-18</p> <p>Focused Assignment: Exercises 1-4, 7, 10, 11</p> <p>Focused Assignment: 1-2, 5, 8-9, 13-17, 22-24</p> <p>Performance Task: Which Lunch</p> <p>Focused Assignment: Exercises 1-5, 8-11, 13, 1, 20, 21, 24</p>	<p>Probability and 2-way tables</p> <p>Compound Probability</p> <p>Probability Space</p> <p>Menu Toss-Up: Choice and Data Sets</p>
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<ul style="list-style-type: none"> Numerically compare 2 data sets using measures of center (mean and median) and measures of variability (IQR and MAD). 	<p>valid inferences.</p> <p>7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be. Draw informal comparative inferences about two populations.</p> <p>7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</p> <p>7.SP.B.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are</p>	<p>Explore! Activity: Comparing Tests</p> <p>Teacher Gems: Masterpiece, Climb the Ladder, Four Corners</p> <p>Gem Challenge</p>	<p>Focused Assignment: Exercises 1-15 odd, 18, 20-21</p> <p>Performance Task: Yard Work</p>	<p>State Data Map</p> <p>Khan Academy- Comparing Distributions</p>
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generally longer than the words in a chapter of a fourth-grade science book. Investigate chance processes and develop, use, and evaluate probability models.			
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Instructional Adjustments:*Modifications/Student difficulties/Common errors*

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shortened assignments, extended time, copy of class notes or access to notes on chromebook, preferential seating, oral reminders, etc.

Ask students to restate information, directions, and assignments.

Emphasize:

- The difference between theoretical probability (what should happen) and experimental probability (what does happen).
- Probability can be written in fraction, decimal and percent form
- **Vocabulary**: biased sample, box-and-whisker plot, compound event, compound probability, dependent events, event, experimental probability, five-number summary, independent event, inference, interquartile range, mean, mean absolute deviation, measures of center, measures of variability, median, mode, outcomes, population, probability, random sample, range, representative sample, sample, simple event, simulation, theoretical probability, trials.