**Subject**

**Mathematics Grade 7**

**Curriculum Guide**

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**LINDEN PUBLIC SCHOOLS**

**LINDEN, NEW JERSEY**

**DR. MARNIE HAZELTON**

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**The Linden Board of Education adopted the Curriculum Guide on:**

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| **JJuly 28, 2022** |  | **Education Report #22** |
| **Date** |  | **Agenda Item** |
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| **Rationale** | | |

**EDUCATION EQUITY:** The Linden Public School District guarantees each student equal educational opportunity regardless of age, race, color, creed, religion, gender, language, affectional or sexual orientation, ancestry, national origin, marital or economic status. For Information, contact District Educational Equity Officer Kevin Thurston at **(**908) 486-2800 x 8307**.**

**NONDISCRIMATION:** The Linden Public School District does not discriminate against handicapped persons in admission or access to or treatment or employment in its programs, activities, and vocational opportunities. For information contact District Public 504 Officer Annabell Louis at (908) 486-2800 x 8025.

**Linden Public Schools Vision**

The Linden Public School District is committed to developing respect for diversity, excellence in education, and a commitment to service, in order to promote global citizenship and ensure personal success for all students

**Linden Public Schools Mission**

The mission of the Linden Public School District is to promote distinction through the infinite resource that is Linden’s diversity, combined with our profound commitment to instructional excellence, so that each and every student achieves their maximum potential in an engaging, inspiring, and challenging learning environment.

**Math Department Vision**

To equip students with the understanding and application of mathematical skills and processes to foster a drive for advanced mathematics and higher-level thinking.

**Math Department Mission Statement**

To develop a community of learners who construct and communicate meaning from the mathematical world around them. Students will experience mathematics that encourage them to think critically, discover and apply concepts to solve problems strategically. Students will be encouraged to solve equations with accuracy, efficiency, and flexibility. Furthermore, students will have a multitude of opportunities to apply mathematical tools and practice standards to solve real-world and multi-step problems.

**Math Department Goals**

* Provide opportunities for student to develop computation skills, conceptual understanding, and problem-solving skills
* Require students to explain, justify or prove their thinking through mathematical reasoning, modeling, and speaking

Course Description

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

This is a one-year course designed to develop reasoning and problem-solving skills. The topics studied include:

Ratios and Proportional Relationships

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

The Number System

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

Expressions and Equations

Use properties of operations to generate equivalent expressions.

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

Geometry

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

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

Statistics and Probability

Use random sampling to draw inferences about a population.

Draw informal comparative inferences about two populations.

Investigate chance processes and develop, use, and evaluate probability models.

Course Instructional Materials

* LPS Adopted Textbooks and Programs
  + Pearson EnVision Grade 7 Mathematics Text
  + Pearson Realize (Computer Based program supplementing EnVision)
* Edmentum Exact Path
* NJSLA Released Items
* Khan Academy

Standards and NJDOE Mandates Guiding Instruction

* 1. New Jersey Student Learning Standards

<https://www.nj.gov/education/standards/math/Docs/2016NJSLS-M_Grade7.pdf>

* 1. Power Standards from NJSLS
* 7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.
* 7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
* 7.EE.A Use properties of operations to generate equivalent expressions.
* 7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Diversity, Equity, and Inclusion

* Use students’ interests in conceptualized tasks
* Expose students to a diverse group of mathematicians
* Design assessments and assignments with a variety of response types
* Use systematic grading and participation methods
* Encourage students to embrace a growth mindset

Pacing Guide

Linden Public Schools

EnVision Pacing Guide

Grade 7 Math

2022-2023

Marking Period 1: Tuesday, September 6, 2022 to Tuesday, November 15, 2022

Topic 1 – Integers and Rational Numbers – Estimated Time: 22 Days

Topic 2 – Analyze and Use Proportional Relationships – Estimated Time: 18 Days

Marking Period 2: Wednesday, November 16, 2022 to Wednesday, January 31, 2023

Topic 3 – Analyze and Solve Percent Problems – Estimated Time: 18 Days

Topic 4 – Generate Equivalent Expressions – Estimated Time: 18 Days

Marking Period 3: Wednesday, February 1, 2023 to Wednesday, April 5, 2023

Topic 5 – Solve Problems Using Equations and Inequalities – Estimated Time: 18 Days

Topic 6 – Use Sampling to Draw Inferences About Populations – Estimated Time: 18 Days

Marking Period 4: Monday, April 17, 2023 to Thursday, June 22, 2023\*

Topic 7 – Probability – Estimated Time: 18 Days

Topic 8 – Solve Problems Involving Geometry – Estimated Time: 20 Days

\*Date may be moved up if inclement weather days are not used

**Assessment days are built into each chapter**.

Pacing Guide

Linden Public Schools

EnVision Pacing Guide

Grade 7 Math Honors

2022-2023

Marking Period 1: Tuesday, September 6, 2022 to Tuesday, November 15, 2022

Topic 1 – Integers and Rational Numbers – Estimated Time: 15 Days

Topic 3 – Analyze and Use Proportional Relationships – Estimated Time: 14 Days

Topic 4 – Analyze and Solve Percent Problems – Estimated Time: 13 Days

Marking Period 2: Wednesday, November 16, 2022 to Wednesday, January 31, 2023

Topic 5 – Generate Equivalent Expressions – Estimated Time: 16 Days

Topic 6 – Solve Problems Using Equations and Inequalities – Estimated Time: 14 Days

Topic 8 – Use Sampling to Draw Inferences About Populations – Estimated Time: 8 Days

Marking Period 3: Wednesday, February 1, 2023 to Wednesday, April 5, 2023

Topic 9 – Probability – Estimated Time: 10 Days

Topic 10 – Solve Problems Involving Geometry – Estimated Time: 12 Days

Topic 2 – Real Numbers – Estimated Time: 15 Days

Marking Period 4: Monday, April 17, 2023 to Thursday, June 22, 2023\*

Topic 7 – Analyze and Solve Linear Equations – Estimated Time: 18 Days

Topic 11 – Congruence and Similarity – Estimated Time: 16 Days

Topic 12 – Solve Problems Involving Surface Area and Volume – Estimated Time: 9 Days

\*Date may be moved up if inclement weather days are not used

**Assessment days are built into each chapter**.

Vertical Integration – Program Mapping

The standards in this unit were introduced in Grade 6. Grade 7 coursework focuses on preparing the students to be proficient in Grade 8 standards AND/OR Algebra 1.

Accommodations, Modifications, and Teacher Strategies

(specific recommendations are made in each unit)

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| **Instructional Strategies**   * Teacher Presentation * Student Presentation * Class Discussion * Reading for Meaning * Inquiry Design Model * Interactive Lecture * Interactive Notetaking * Compare and Contrast * Research Based * Problem Based * Project Based   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits occupational or physical therapy | **Gifted and Talent Accommodations and Modifications**   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas | **Special Education and At-Risk Accommodations and Modifications**   * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate | **English Language Learners Accommodations and Modifications**   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials, including visuals * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Allow students to work at their own pace * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Role play * Provide graphic organizers, highlighted materials * Strategy and flexible groups based on formative assessment |

**Unit #1: The Number System**

Content Area: **Mathematics**  
Course(s): **Math 7**  
Time Period: **Marking Period 1**   
Length: **22 Days**  
Status: **Published**

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| **Unit Overview** |
| This unit is aligned to the following topics: *Integers and Rational Numbers*.  1. Students will be able to compare and order rational numbers, perform all four operations with rational numbers.  2. Utilize number properties and identities to simplify and solve problems.  3. Write equivalent expressions using the Distributive Property.  4. Find the opposite and absolute values of a rational number, realize that all rational numbers can be expressed as terminating or repeating decimals.  5. Explain why zero cannot be in the denominator of a fraction. |

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| **STAGE 1- DESIRED RESULTS** |

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| **Educational Standards** |
| The following goals, as outlined in the NJSLS, will provide a framework for preparation and instruction in mathematics. They are the eight mathematical practice standards:  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. |

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| **New Jersey Student Learning Standards- Mathematics** |

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| **Introduction- Grade 7** |
| |  |  | | --- | --- | | MA.7.7 | In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. | | MA.7.7.1 | Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships. | | MA.7.7.2 | Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. | | MA.7.7.3 | Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | MA.7.7.4 | Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. | |

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| **Ratios and Proportional Relationships** |
| |  |  | | --- | --- | | MA.7.RP.A | Analyze proportional relationships and use them to solve real-world and mathematical problems. | | MA.7.RP.A.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. | | MA.7.RP.A.2 | Recognize and represent proportional relationships between quantities. | | MA.7.RP.A.2a | Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. | | MA.7.RP.A.2b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | | MA.7.RP.A.2c | Represent proportional relationships by equations. | | MA.7.RP.A.2d | Explain what a point (𝑥, 𝑦) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, 𝑟) where 𝑟 is the unit rate. | | MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. | |

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| **The Number System** |
| |  |  | | --- | --- | | MA.7.NS.A.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. | | MA.7.NS.A | Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | | MA.7.NS.A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. | | MA.7.NS.A.1a | Describe situations in which opposite quantities combine to make 0. | | MA.7.NS.A.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. | | MA.7.NS.A.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. | | MA.7.NS.A.1d | Apply properties of operations as strategies to add and subtract rational numbers. | | MA.7.NS.A.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. | | MA.7.NS.A.2a | Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. | | MA.7.NS.A.2b | Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If 𝑝 and 𝑞 are integers, then –(𝑝/𝑞) = (–𝑝)/𝑞 = 𝑝/(–𝑞). Interpret quotients of rational numbers by describing real-world contexts. | | MA.7.NS.A.2c | Apply properties of operations as strategies to multiply and divide rational numbers. | | MA.7.NS.A.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. | |

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| **Expressions and Equations** |
| |  |  | | --- | --- | | MA.7.EE.B.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. | | MA.7.EE.B.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. | | MA.7.EE.A | Use properties of operations to generate equivalent expressions. | | MA.7.EE.A.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | | MA.7.EE.A.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. | | MA.7.EE.B | Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | | MA.7.EE.B.3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | | MA.7.EE.B.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. | |

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| **Geometry** |
| |  |  | | --- | --- | | MA.7.G.A | Draw, construct, and describe geometrical figures and describe the relationships between them. | | MA.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. | | MA.7.G.A.2 | Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | | MA.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. | | MA.7.G.B | Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. | | MA.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. | | MA.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. | | MA.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. | |

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| **Statistics and Probability** |
| |  |  | | --- | --- | | MA.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. | | MA.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. | | MA.7.SP.C.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | | MA.7.SP.C.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | | MA.7.SP.C.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | | MA.7.SP.C.8a | Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | | MA.7.SP.C.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. | | MA.7.SP.C.8c | Design and use a simulation to generate frequencies for compound events. | | MA.7.SP.A | Use random sampling to draw inferences about a population. | | MA.7.SP.A.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | | MA.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. | | MA.7.SP.B | Draw informal comparative inferences about two populations. | | MA.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. | | MA.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. | | MA.7.SP.C | Investigate chance processes and develop, use, and evaluate probability models. | | MA.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. | |

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| **Career Ready Practices** |
| 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.  CRP12.   Work productively in teams while using cultural global competence. |

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| **Essential Questions** |
| * How can adding and subtracting integers be represented on a number line? * Why is subtracting rational numbers the same as adding the additive inverse? * How can the properties of operations be applied to adding, subtracting, multiplying, and dividing? * What strategies are used to convert rational numbers into equivalent forms? * What happens to a sum when moving in a negative or positive direction on a number line? * How can you model subtracting integers using Algebra Chips? * Will adding or multiplying integers in any order change the result? * How can fractions, decimals be written as equivalent numbers? |

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| **Enduring Understanding** |
| * Opposite quantities combine to make zero. * Addition and subtraction of rational numbers means moving a positive or negative movement on a number line. * Understand subtraction of rational numbers as adding the additive inverse. * Properties of operations can be used to add, subtract, multiply and divide rational numbers. * Rational numbers can be converted between fractions, decimals and percents. * How the Additive Inverse of a number results in a sum of zero? * How to use a number line to add or subtract integers? * What property can be used when subtracting integers? * How are properties applied to number operations involving rational numbers? * What is the connection between fractions, decimals and percents? |

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| **Students will know...** |
| * How the Additive Inverse of a number results in a sum of zero? * How to use a number line to add or subtract integers? * What property can be used when subtracting integers? * How are properties applied to number operations involving rational numbers? * What is the connection between fractions, decimals and percents? |

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| **Students will be able to...** |
| * Opposite quantities combine to make zero. * Addition and subtraction of rational numbers means moving a positive or negative movement on a number line. * Understand subtraction of rational numbers as adding the additive inverse. * Properties of operations can be used to add, subtract, multiply and divide rational numbers. * Rational numbers can be converted between fractions, decimals and percents. |

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| **STAGE 2- EVIDENCE OF LEARNING** |
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| **Formative Assessment Suggestions** |
| 3- Minute Pause  Analogy Prompt  Choral Response  Debriefing  Exit Card / Ticket  Hand Signals  Index card summaries  Journal Entry  Misconception Check  Observation  Portfolio Check  Questions & Answers  Quiz  Self-Assessment  Student Conference  Think-Pair-Share  Think-Ink-Share  Web or Concept Map   |  |  | | --- | --- | | • 3- Minute Pause | **.** | | • A-B-C Summaries | **.** | | • Analogy Prompt | **.** | | • Choral Response | **.** | | • Debriefing | **.** | | • Exit Card / Ticket | **.** | | • Hand Signals | **.** | | • Idea Spinner | **.** | | • Index Card Summaries | **.** | | • Inside-Outside Circle Discussion (Fishbowl) | **.** | | • Journal Entry | **.** | | • Misconception Check | **.** | | • Observation | **.** | | • One Minute Essay | **.** | | • One Word Summary | **.** | | • Portfolio Check | **.** | | • Questions & Answers | **.** | | • Quiz | **.** | | • Self-Assessment | **.** | | • Student Conference | **.** | | • Think-Pair-Share | **.** | | • Web or Concept Map | **.** | |

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| **Authentic Assessments Suggestions** |
| Through the following authentic assessments, students will develop traits regarding thinking and reasoning, settings, mathematical tools and attitudes and dispositions:  1. Performance Assessments  2. Short Investigations  3. Open Ended Response Questions  4.  Portfolios  5.  Self-Assessments |

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| **Benchmark Assessments** |
| **Math 7 Honors**  Pearson Realize -- Topics 1-3: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-9: Cumulative/Benchmark Assessment  Pearson Realize --  End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration  **Math 7**  Pearson Realize --  Topics 1-2: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-4: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize --  End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration |

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| **STAGE 3- LEARNING PLAN** |
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| **Instructional Map** |
| **Step 1: What is it we want and expect students to learn?**   * Read domain overview, learning goal, and essential questions to gain an initial understanding of the domain. * Analyze cluster of standards, vertical progression, test item specifications to determine full intent of standards (DOK) and student outcomes. * Determine measurable objectives using unpacked standards. Review the assessments for determining acceptable evidence.   **Step 2: How will they learn it?**   * Select problem-based learning/formative assessment tasks. * Develop learning experiences utilizing the textbook and selected tasks along with higher order questions stems.   **Step 3: How will we know when they have learned it?**   * As a PLC, analyze students’ work reflecting on teacher practice and provide student feedback. * Provide additional assessments as necessary and collaboratively analyze the results.   **Step 4: How will we respond if they don’t learn it? How will we respond to those who already know it?**   * Using data analysis, develop small groups for enrichment and remediation. * Reassess student performance and provide opportunities for application. |

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| **Modifications/Differentiation of Instruction** |
| Differentiation Strategies for Special Education Students   * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate   Differentiation Strategies for Gifted and Talented Students   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas   Differentiated Strategies for ELL Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials, including visuals * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Allow students to work at their own pace * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Role play * Provide graphic organizers, highlighted materials * Strategy and flexible groups based on formative assessment   Differentiation Strategies for At Risk Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits * occupational or physical therapy |

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| **Modification Strategies** |
| |  |  | | --- | --- | | • Extended Time | **.** | | • Frequent Breaks | **.** | | • Highlighted Text | **.** | | • Interactive Notebook | **.** | | • Modified Test | **.** | | • Oral Directions | **.** | | • Peer Tutoring | **.** | | • Preferential Seating | **.** | | • Re-Direct | **.** | | • Repeated Drill / Practice | **.** | | • Shortened Assignments | **.** | | • Teacher Notes | **.** | | • Tutorials | **.** | | • Use of Additional Reference Material | **.** | | • Use of Audio Resources | **.** | |

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| **High Preparation Differentiation** |
| |  |  | | --- | --- | | • Alternative Assessments | **.** | | • Choice Boards | **.** | | • Games and Tournaments | **.** | | • Group Investigations | **.** | | • Guided Reading | **.** | | • Independent Research / Project | **.** | | • Interest Groups | **.** | | • Learning Contracts | **.** | | • Leveled Rubrics | **.** | | • Literature Circles | **.** | | • Menu Assignments | **.** | | • Multiple Intelligence Options | **.** | | • Multiple Texts | **.** | | • Personal Agendas | **.** | | • Project Based Learning (PBL) | **.** | | • Stations / Centers | **.** | | • Think-Tac-Toe | **.** | | • Tiered Activities / Assignments | **.** | | • Varying Graphic Organizers | **.** | |

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| **Low Preparation Differentiation** |
| |  |  | | --- | --- | | • Choice of Book / Activity | **.** | | • Cubing Activities | **.** | | • Exploration by Interest (using interest inventories) | **.** | | • Flexible Grouping | **.** | | • Goal Setting With Student | **.** | | • Homework Options | **.** | | • Jigsaw | **.** | | • Mini Workshops to Extend Skills | **.** | | • Mini Workshops to Re-teach | **.** | | • Open-ended Activities | **.** | | • Think-Pair-Share by Interest | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Readiness | **.** | | • Use of Collaboration | **.** | | • Use of Reading Buddies | **.** | | • Varied Journal Prompts | **.** | | • Varied Product Choice | **.** | | • Varied Supplemental Materials | **.** | | • Work Alone / Together | **.** | |

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| **Vertical Integration- Discipline Mapping** |
| The Number System Vertical Alignment  In Grade 6 Students will be able to do...   * Apply and extend previous understanding of multiplication and division to divide fractions by fractions. * Compute fluently with multi-digit numbers and find common factors and multiples. * Apply and extend previous understandings of numbers to the system of rational numbers.   In Grade 7 Students will be able to do...   * Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers.   In Grade 8 Students will be able to do...   * Know that there are numbers that are not rational, and approximate them by rational numbers. |

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| **Additional Materials** |
| * LPS Adopted Textbooks and Programs   + Pearson EnVision Grade 7 Mathematics Text   + Pearson Realize (Computer Based program supplementing EnVision) * Edmentum Exact Path * NJSLA Released Items * Khan Academy |

**Unit #2: Ratios and Proportions**

Content Area: **Mathematics**  
Course(s): **Math 7**   
Time Period: **Marking Periods 1-2**  
Length: **36 Days**  
Status: **Published**

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| **Unit Overview** |
| This unit is aligned to the following topics: *Analyze and Use Proportional Relationships* and *Analyze and Solve Percent Problems*.  1. Students will compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.  2. Students will recognize and represent proportional relationships between quan tities by deciding whether two quantities are in a proportional relationship and identifying the constant of proportionality (unit rate).  3. Students will use proportional relationships to solve multi-step ratio and percent problems.  4. Students will be able to find sales tax, tip, discounts, scale drawings.  5. Students will be able to extend knowledge of all four operations with rational numbers. |

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| **STAGE 1- DESIRED RESULTS** |
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| **Educational Standards** |
| The following goals, as outlined in the NJSLS, will provide a framework for preparation and instruction in mathematics. They make up the eight mathematical practice standards:  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. |

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| **New Jersey Student Learning Standards- Mathematics** |
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| **Introduction- Grade 7** |
| |  |  | | --- | --- | | MA.7.7 | In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. | | MA.7.7.1 | Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships. | | MA.7.7.2 | Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. | | MA.7.7.3 | Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | MA.7.7.4 | Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. | |

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| **Ratios and Proportional Relationships** |
| |  |  | | --- | --- | | MA.7.RP.A | Analyze proportional relationships and use them to solve real-world and mathematical problems. | | MA.7.RP.A.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. | | MA.7.RP.A.2 | Recognize and represent proportional relationships between quantities. | | MA.7.RP.A.2a | Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. | | MA.7.RP.A.2b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | | MA.7.RP.A.2c | Represent proportional relationships by equations. | | MA.7.RP.A.2d | Explain what a point (𝑥, 𝑦) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, 𝑟) where 𝑟 is the unit rate. | | MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. | |

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| **The Number System** |
| |  |  | | --- | --- | | MA.7.NS.A.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. | | MA.7.NS.A | Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | | MA.7.NS.A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. | | MA.7.NS.A.1a | Describe situations in which opposite quantities combine to make 0. | | MA.7.NS.A.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. | | MA.7.NS.A.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. | | MA.7.NS.A.1d | Apply properties of operations as strategies to add and subtract rational numbers. | | MA.7.NS.A.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. | | MA.7.NS.A.2a | Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. | | MA.7.NS.A.2b | Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If 𝑝 and 𝑞 are integers, then –(𝑝/𝑞) = (–𝑝)/𝑞 = 𝑝/(–𝑞). Interpret quotients of rational numbers by describing real-world contexts. | | MA.7.NS.A.2c | Apply properties of operations as strategies to multiply and divide rational numbers. | | MA.7.NS.A.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. | |

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| **Expressions and Equations** |
| |  |  | | --- | --- | | MA.7.EE.B.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. | | MA.7.EE.B.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. | | MA.7.EE.A | Use properties of operations to generate equivalent expressions. | | MA.7.EE.A.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | | MA.7.EE.A.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. | | MA.7.EE.B | Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | | MA.7.EE.B.3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | | MA.7.EE.B.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. | |

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| **Geometry** |
| |  |  | | --- | --- | | MA.7.G.A | Draw, construct, and describe geometrical figures and describe the relationships between them. | | MA.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. | | MA.7.G.A.2 | Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | | MA.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. | | MA.7.G.B | Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. | | MA.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. | | MA.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. | | MA.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. | |

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| **Statistics and Probability** |
| |  |  | | --- | --- | | MA.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. | | MA.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. | | MA.7.SP.C.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | | MA.7.SP.C.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | | MA.7.SP.C.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | | MA.7.SP.C.8a | Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | | MA.7.SP.C.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. | | MA.7.SP.C.8c | Design and use a simulation to generate frequencies for compound events. | | MA.7.SP.A | Use random sampling to draw inferences about a population. | | MA.7.SP.A.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | | MA.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. | | MA.7.SP.B | Draw informal comparative inferences about two populations. | | MA.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. | | MA.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. | | MA.7.SP.C | Investigate chance processes and develop, use, and evaluate probability models. | | MA.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. | |

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| **Career Ready Practices** |
| 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.  CRP12.   Work productively in teams while using cultural global competence. |

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| **Essential Questions** |
| * What is a complex fraction and how does it relate to unit rate? * What strategies can be used to check for proportionality? * How can proportions be used to solve percent problems? * What is the average rate of speed? * How to compare rates from given data? * How to use models to find actual size of objects? * What are discounts, sales tax, tip and wholesale prices? |

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| **Enduring Understanding** |
| * Unit rates can be computed using complex fractions. * Proportional relationships can be determined using a variety of strategies. * Proportions can be used to solve multistep ratio and percent. * How to use rates to compare two quantities with different units. * How to find the slope of a line. * Solving proportions using scale, and determine missing lengths using similar figures. * Utilize proportions to solve percent problems. |

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| **Students will know...** |
| * How to use rates to compare two quantities with different units. * How to find the slope of a line. * Solving proportions using scale, Algebra; determine missing lengths using similar figures. * Utilize proportions to solve percent problems. |

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| **Students will be able to...** |
| * Unit rates can be computed using complex fractions. * Proportional relationships can be determined using a variety of strategies. * Proportions can be used to solve multistep ratio and percent problems. |

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| **STAGE 2- EVIDENCE OF LEARNING** |
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| **Formative Assessment Suggestions** |
| 3- Minute Pause  Analogy Prompt  Choral Response  Debriefing  Exit Card / Ticket  Hand Signals  Index card summaries  Journal Entry  Misconception Check  Observation  Portfolio Check  Questions & Answers  Quiz  Self-Assessment  Student Conference  Think-Pair-Share  Think-Ink-Share  Web or Concept Map   |  |  | | --- | --- | | • 3- Minute Pause | **.** | | • A-B-C Summaries | **.** | | • Analogy Prompt | **.** | | • Choral Response | **.** | | • Debriefing | **.** | | • Exit Card / Ticket | **.** | | • Hand Signals | **.** | | • Idea Spinner | **.** | | • Index Card Summaries | **.** | | • Inside-Outside Circle Discussion (Fishbowl) | **.** | | • Journal Entry | **.** | | • Misconception Check | **.** | | • Observation | **.** | | • One Minute Essay | **.** | | • One Word Summary | **.** | | • Portfolio Check | **.** | | • Questions & Answers | **.** | | • Quiz | **.** | | • Self-Assessment | **.** | | • Student Conference | **.** | | • Think-Pair-Share | **.** | | • Web or Concept Map | **.** | |

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| **Authentic Assessments Suggestions** |
| Through the following authentic assessments, students will develop traits regarding thinking and reasoning, settings, mathematical tools and attitudes and dispositions:  1. Performance Assessments  2. Short Investigations  3. Open Ended Response Questions  4.  Portfolios  5.  Self-Assessments |

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| **Benchmark Assessments** |
| Math 7 Honors  Pearson Realize -- Topics 1-3: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-9: Cumulative/Benchmark Assessment  Pearson Realize --  End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration    Math 7  Pearson Realize --  Topics 1-2: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-4: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize --  End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration |

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| **STAGE 3- LEARNING PLAN** |

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| **Instructional Map** |
| **Step 1: What is it we want and expect students to learn?**   * Read domain overview, learning goal, and essential questions to gain an initial understanding of the domain. * Analyze cluster of standards, vertical progression, test item specifications to determine full intent of standards (DOK) and student outcomes. * Determine measurable objectives using unpacked standards. Review the assessments for determining acceptable evidence.   **Step 2: How will they learn it?**   * Select problem-based learning/formative assessment tasks. * Develop learning experiences utilizing the textbook and selected tasks along with higher order questions stems.   **Step 3: How will we know when they have learned it?**   * As a PLC, analyze students’ work reflecting on teacher practice and provide student feedback. * Provide additional assessments as necessary and collaboratively analyze the results.   **Step 4: How will we respond if they don’t learn it? How will we respond to those who already know it?**   * Using data analysis, develop small groups for enrichment and remediation. * Reassess student performance and provide opportunities for application. |

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| **Modifications/Differentiation of Instruction** |
| Differentiation Strategies for Special Education Students   * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate   Differentiation Strategies for Gifted and Talented Students   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas   Differentiated Strategies for ELL Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials, including visuals * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide 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and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits * occupational or physical therapy |

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| **Modification Strategies** |
| |  |  | | --- | --- | | • Extended Time | **.** | | • Frequent Breaks | **.** | | • Highlighted Text | **.** | | • Interactive Notebook | **.** | | • Modified Test | **.** | | • Oral Directions | **.** | | • Peer Tutoring | **.** | | • Preferential Seating | **.** | | • Re-Direct | **.** | | • Repeated Drill / Practice | **.** | | • Shortened Assignments | **.** | | • Teacher Notes | **.** | | • Tutorials | **.** | | • Use of Additional Reference Material | **.** | | • Use of Audio Resources | **.** | |

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| **High Preparation Differentiation** |
| |  |  | | --- | --- | | • Alternative Assessments | **.** | | • Choice Boards | **.** | | • Games and Tournaments | **.** | | • Group Investigations | **.** | | • Guided Reading | **.** | | • Independent Research / Project | **.** | | • Interest Groups | **.** | | • Learning Contracts | **.** | | • Leveled Rubrics | **.** | | • Literature Circles | **.** | | • Menu Assignments | **.** | | • Multiple Intelligence Options | **.** | | • Multiple Texts | **.** | | • Personal Agendas | **.** | | • Project Based Learning (PBL) | **.** | | • Stations / Centers | **.** | | • Think-Tac-Toe | **.** | | • Tiered Activities / Assignments | **.** | | • Varying Graphic Organizers | **.** | |

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| **Low Preparation Differentiation** |
| |  |  | | --- | --- | | • Choice of Book / Activity | **.** | | • Cubing Activities | **.** | | • Exploration by Interest (using interest inventories) | **.** | | • Flexible Grouping | **.** | | • Goal Setting With Student | **.** | | • Homework Options | **.** | | • Jigsaw | **.** | | • Mini Workshops to Extend Skills | **.** | | • Mini Workshops to Re-teach | **.** | | • Open-ended Activities | **.** | | • Think-Pair-Share by Interest | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Readiness | **.** | | • Use of Collaboration | **.** | | • Use of Reading Buddies | **.** | | • Varied Journal Prompts | **.** | | • Varied Product Choice | **.** | | • Varied Supplemental Materials | **.** | | • Work Alone / Together | **.** | |

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| **Vertical Integration- Discipline Mapping** |
| Ratios and Proportions Vertical Alignment  In Grade 6 Students will be able to do...   * Understand ratio concepts and use ratio reasoning to solve problems.   In Grade 7 Students will be able to do...   * Analyze proportional relationships and use them to solve real-world and mathematical problems.   In Grade 8 Students will be able to do...   * Know that there are numbers that are not rational, and approximate them by rational numbers. |

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| **Additional Materials** |
| * LPS Adopted Textbooks and Programs   + Pearson EnVision Grade 7 Mathematics Text   + Pearson Realize (Computer Based program supplementing EnVision) * Edmentum Exact Path * NJSLA Released Items * Khan Academy |

**Unit #3: Expressions and Equations**

Content Area: **Mathematics**  
Course(s): **Math 7**  
Time Period: **Marking Periods 2-3**   
Length: **36 Days**  
Status: **Published**

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| **Unit Overview** |
| This unit is aligned to the following topics: *Generate Equivalent Expressions* and *Solve Problems Using Equations and Inequalities*.  1. Students will be able to write and simplify expressions.  2. write and solve equations,  3. solve and graph inequalities, and  4. determine reasonableness of an answer using estimation. |

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| **STAGE 1- DESIRED RESULTS** |
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| **Educational Standards** |
| The following goals, as outlined in the NJSLS, will provide a framework for preparation and instruction in mathematics. They make up the eight mathematical practice standards:  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. |

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| **New Jersey Student Learning Standards- Mathematics** |

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| **Introduction- Grade 7** |
| |  |  | | --- | --- | | MA.7.7 | In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. | | MA.7.7.1 | Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships. | | MA.7.7.2 | Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. | | MA.7.7.3 | Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | MA.7.7.4 | Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. | |

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| **Ratios and Proportional Relationships** |
| |  |  | | --- | --- | | MA.7.RP.A | Analyze proportional relationships and use them to solve real-world and mathematical problems. | | MA.7.RP.A.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. | | MA.7.RP.A.2 | Recognize and represent proportional relationships between quantities. | | MA.7.RP.A.2a | Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. | | MA.7.RP.A.2b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | | MA.7.RP.A.2c | Represent proportional relationships by equations. | | MA.7.RP.A.2d | Explain what a point (𝑥, 𝑦) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, 𝑟) where 𝑟 is the unit rate. | | MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. | |

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| **The Number System** |
| |  |  | | --- | --- | | MA.7.NS.A.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. | | MA.7.NS.A | Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | | MA.7.NS.A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. | | MA.7.NS.A.1a | Describe situations in which opposite quantities combine to make 0. | | MA.7.NS.A.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. | | MA.7.NS.A.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. | | MA.7.NS.A.1d | Apply properties of operations as strategies to add and subtract rational numbers. | | MA.7.NS.A.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. | | MA.7.NS.A.2a | Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. | | MA.7.NS.A.2b | Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If 𝑝 and 𝑞 are integers, then –(𝑝/𝑞) = (–𝑝)/𝑞 = 𝑝/(–𝑞). Interpret quotients of rational numbers by describing real-world contexts. | | MA.7.NS.A.2c | Apply properties of operations as strategies to multiply and divide rational numbers. | | MA.7.NS.A.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. | |

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| **Expressions and Equations** |
| |  |  | | --- | --- | | MA.7.EE.B.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. | | MA.7.EE.B.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. | | MA.7.EE.A | Use properties of operations to generate equivalent expressions. | | MA.7.EE.A.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | | MA.7.EE.A.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. | | MA.7.EE.B | Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | | MA.7.EE.B.3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | | MA.7.EE.B.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. | |

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| **Geometry** |
| |  |  | | --- | --- | | MA.7.G.A | Draw, construct, and describe geometrical figures and describe the relationships between them. | | MA.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. | | MA.7.G.A.2 | Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | | MA.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. | | MA.7.G.B | Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. | | MA.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. | | MA.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. | | MA.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. | |

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| **Statistics and Probability** |
| |  |  | | --- | --- | | MA.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. | | MA.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. | | MA.7.SP.C.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | | MA.7.SP.C.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | | MA.7.SP.C.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | | MA.7.SP.C.8a | Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | | MA.7.SP.C.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. | | MA.7.SP.C.8c | Design and use a simulation to generate frequencies for compound events. | | MA.7.SP.A | Use random sampling to draw inferences about a population. | | MA.7.SP.A.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | | MA.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. | | MA.7.SP.B | Draw informal comparative inferences about two populations. | | MA.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. | | MA.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. | | MA.7.SP.C | Investigate chance processes and develop, use, and evaluate probability models. | | MA.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. | |

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| **Career Ready Practices** |
| 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.  CRP12.   Work productively in teams while using cultural global competence. |

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| **Essential Questions** |
| * What strategies can be used to simplify expressions with rational coefficients? * How can writing equations and inequalities help solve mathematical and real life problems? * How can we interpret the solution of an inequality by graphing it? * What properties can be used to simplify expressions? * How can real life situations be represented using equations and inequalities? * How does a graph show an infinite number of solutions to an inequality? |

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| **Enduring Understanding** |
| * Properties of operations can be used to simplify and write equivalent expressions. * Numerical and algebraic expressions using numbers of any form can be used to solve real world problems. * Equations and inequalities can be written to solve mathematical problems. * The solution set of an inequality can be graphed to interpret it in the context of the problem. * How properties allow us to combine like terms. * How to write an expression to represent a real world situation. * How to represent real world situations using equations and inequalities. * How to understand the inequalities have an infinite number of solutions. |

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| **Students will know...** |
| * How properties allow us to combine like terms. * How to write an expression to represent a real world situation. * How to represent real world situations using equations and inequalities. * How to understand the inequalities have an infinite number of solutions. |

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| **Students will be able to...** |
| * Properties of operations can be used to simplify and write equivalent expressions. * Numerical and algebraic expressions using numbers of any form can be used to solve real world problems. * Equations and inequalities can be written to solve mathematical problems. * The solution set of an inequality can be graphed to interpret it in the context of the problem. |

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| **STAGE 2- EVIDENCE OF LEARNING** |
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| **Formative Assessment Suggestions** |
| 3- Minute Pause  Analogy Prompt  Choral Response  Debriefing  Exit Card / Ticket  Hand Signals  Index card summaries  Journal Entry  Misconception Check  Observation  Portfolio Check  Questions & Answers  Quiz  Self-Assessment  Student Conference  Think-Pair-Share  Think-Ink-Share  Web or Concept Map   |  |  | | --- | --- | | • 3- Minute Pause | **.** | | • A-B-C Summaries | **.** | | • Analogy Prompt | **.** | | • Choral Response | **.** | | • Debriefing | **.** | | • Exit Card / Ticket | **.** | | • Hand Signals | **.** | | • Idea Spinner | **.** | | • Index Card Summaries | **.** | | • Inside-Outside Circle Discussion (Fishbowl) | **.** | | • Journal Entry | **.** | | • Misconception Check | **.** | | • Observation | **.** | | • One Minute Essay | **.** | | • One Word Summary | **.** | | • Portfolio Check | **.** | | • Questions & Answers | **.** | | • Quiz | **.** | | • Self-Assessment | **.** | | • Student Conference | **.** | | • Think-Pair-Share | **.** | | • Web or Concept Map | **.** | |

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| **Authentic Assessments Suggestions** |
| Through the following authentic assessments, students will develop traits regarding thinking and reasoning, settings, mathematical tools and attitudes and dispositions:  1. Performance Assessments  2. Short Investigations  3. Open Ended Response Questions  4.  Portfolios  5.  Self-Assessments |

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| **Benchmark Assessments** |
| Math 7 Honors  Pearson Realize -- Topics 1-3: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-9: Cumulative/Benchmark Assessment  Pearson Realize -- End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration    Math 7  Pearson Realize -- Topics 1-2: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-4: Cumulative/Benchmark Assessment  Pearson Realize --  Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize -- End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration |

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| **STAGE 3- LEARNING PLAN** |

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| **Instructional Map** |
| **Step 1: What is it we want and expect students to learn?**   * Read domain overview, learning goal, and essential questions to gain an initial understanding of the domain. * Analyze cluster of standards, vertical progression, test item specifications to determine full intent of standards (DOK) and student outcomes. * Determine measurable objectives using unpacked standards. Review the assessments for determining acceptable evidence.   **Step 2: How will they learn it?**   * Select problem-based learning/formative assessment tasks. * Develop learning experiences utilizing the textbook and selected tasks along with higher order questions stems.   **Step 3: How will we know when they have learned it?**   * As a PLC, analyze students’ work reflecting on teacher practice and provide student feedback. * Provide additional assessments as necessary and collaboratively analyze the results.   **Step 4: How will we respond if they don’t learn it? How will we respond to those who already know it?**   * Using data analysis, develop small groups for enrichment and remediation. * Reassess student performance and provide opportunities for application. |

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| **Modifications/Differentiation of Instruction** |
| Differentiation Strategies for Special Education Students   * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate   Differentiation Strategies for Gifted and Talented Students   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas   Differentiated Strategies for ELL Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials, including visuals * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Allow students to work at their own pace * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Role play * Provide graphic organizers, highlighted materials * Strategy and flexible groups based on formative assessment   Differentiation Strategies for At Risk Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits * occupational or physical therapy |

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| **Modification Strategies** |
| |  |  | | --- | --- | | • Extended Time | **.** | | • Frequent Breaks | **.** | | • Highlighted Text | **.** | | • Interactive Notebook | **.** | | • Modified Test | **.** | | • Oral Directions | **.** | | • Peer Tutoring | **.** | | • Preferential Seating | **.** | | • Re-Direct | **.** | | • Repeated Drill / Practice | **.** | | • Shortened Assignments | **.** | | • Teacher Notes | **.** | | • Tutorials | **.** | | • Use of Additional Reference Material | **.** | | • Use of Audio Resources | **.** | |

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| **High Preparation Differentiation** |
| |  |  | | --- | --- | | • Alternative Assessments | **.** | | • Choice Boards | **.** | | • Games and Tournaments | **.** | | • Group Investigations | **.** | | • Guided Reading | **.** | | • Independent Research / Project | **.** | | • Interest Groups | **.** | | • Learning Contracts | **.** | | • Leveled Rubrics | **.** | | • Literature Circles | **.** | | • Menu Assignments | **.** | | • Multiple Intelligence Options | **.** | | • Multiple Texts | **.** | | • Personal Agendas | **.** | | • Project Based Learning (PBL) | **.** | | • Stations / Centers | **.** | | • Think-Tac-Toe | **.** | | • Tiered Activities / Assignments | **.** | | • Varying Graphic Organizers | **.** | |

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| **Low Preparation Differentiation** |
| |  |  | | --- | --- | | • Choice of Book / Activity | **.** | | • Cubing Activities | **.** | | • Exploration by Interest (using interest inventories) | **.** | | • Flexible Grouping | **.** | | • Goal Setting With Student | **.** | | • Homework Options | **.** | | • Jigsaw | **.** | | • Mini Workshops to Extend Skills | **.** | | • Mini Workshops to Re-teach | **.** | | • Open-ended Activities | **.** | | • Think-Pair-Share by Interest | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Readiness | **.** | | • Use of Collaboration | **.** | | • Use of Reading Buddies | **.** | | • Varied Journal Prompts | **.** | | • Varied Product Choice | **.** | | • Varied Supplemental Materials | **.** | | • Work Alone / Together | **.** | |

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| **Vertical Integration- Discipline Mapping** |
| Expressions and Equations Vertical Alignment  In Grade 6 Students will be able to do...   * Apply and extend previous understandings of arithmetic to algebraic expressions. * Reason about and solve one-variable equations and inequalities. * Represent and analyze quantitative relationships between dependent and independent variables.     In Grade 7 Students will be able to do...   * Use properties of operations to generate equivalent expressions. * Solve real-life and mathematical problems using numerical and algebraic expressions and equations.     In Grade 8 Students will be able to do...   * Work with radicals and integer exponents. * Understand the connections between proportional relationships, lines, and linear equations. * Analyze and solve linear equations and pairs of simultaneous linear equations. |

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| **Additional Materials** |
| * LPS Adopted Textbooks and Programs   + Pearson EnVision Grade 7 Mathematics Text   + Pearson Realize (Computer Based program supplementing EnVision) * Edmentum Exact Path * NJSLA Released Items * Khan Academy |

**Unit #4: Statistics and Probability**

Content Area: **Mathematics**  
Course(s): **Math 7**  
Time Period: **Marking Periods 3-4**  
Length: **36 Days**  
Status: **Published**

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| **Unit Overview** |
| This unit is aligned to the following topics: *Use Sampling to Draw Inferences About Populations* and *Probability*.  1. Students will be able to make inferences, predictions, generalizations and conclusions from sample data.  2. Find, compare and contrast measures of center of data; express data as a multiple of measure of variability.  3. Determine probability and likelihood of an event; collect data based on an experiment; record data using frequency charts.  4. Create and interpret results of a chance event; make tree diagrams; use the Counting Principle; design and interpret results of a simulation. |

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| **STAGE 1- DESIRED RESULTS** |
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| **Educational Standards** |
| The following goals, as outlined in the NJSLS, will provide a framework for preparation and instruction in mathematics. They make up the eight mathematical practice standards:  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. |

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| **New Jersey Student Learning Standards- Mathematics** |
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| **Introduction- Grade 7** |
| |  |  | | --- | --- | | MA.7.7 | In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. | | MA.7.7.1 | Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships. | | MA.7.7.2 | Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. | | MA.7.7.3 | Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | MA.7.7.4 | Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. | |

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| **Ratios and Proportional Relationships** |
| |  |  | | --- | --- | | MA.7.RP.A | Analyze proportional relationships and use them to solve real-world and mathematical problems. | | MA.7.RP.A.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. | | MA.7.RP.A.2 | Recognize and represent proportional relationships between quantities. | | MA.7.RP.A.2a | Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. | | MA.7.RP.A.2b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | | MA.7.RP.A.2c | Represent proportional relationships by equations. | | MA.7.RP.A.2d | Explain what a point (𝑥, 𝑦) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, 𝑟) where 𝑟 is the unit rate. | | MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. | |

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| **The Number System** |
| |  |  | | --- | --- | | MA.7.NS.A.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. | | MA.7.NS.A | Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | | MA.7.NS.A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. | | MA.7.NS.A.1a | Describe situations in which opposite quantities combine to make 0. | | MA.7.NS.A.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. | | MA.7.NS.A.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. | | MA.7.NS.A.1d | Apply properties of operations as strategies to add and subtract rational numbers. | | MA.7.NS.A.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. | | MA.7.NS.A.2a | Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. | | MA.7.NS.A.2b | Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If 𝑝 and 𝑞 are integers, then –(𝑝/𝑞) = (–𝑝)/𝑞 = 𝑝/(–𝑞). Interpret quotients of rational numbers by describing real-world contexts. | | MA.7.NS.A.2c | Apply properties of operations as strategies to multiply and divide rational numbers. | | MA.7.NS.A.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. | |

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| **Expressions and Equations** |
| |  |  | | --- | --- | | MA.7.EE.B.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. | | MA.7.EE.B.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. | | MA.7.EE.A | Use properties of operations to generate equivalent expressions. | | MA.7.EE.A.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | | MA.7.EE.A.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. | | MA.7.EE.B | Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | | MA.7.EE.B.3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | | MA.7.EE.B.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. | |

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| **Geometry** |
| |  |  | | --- | --- | | MA.7.G.A | Draw, construct, and describe geometrical figures and describe the relationships between them. | | MA.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. | | MA.7.G.A.2 | Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | | MA.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. | | MA.7.G.B | Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. | | MA.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. | | MA.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. | | MA.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. | |

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| **Statistics and Probability** |
| |  |  | | --- | --- | | MA.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. | | MA.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. | | MA.7.SP.C.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | | MA.7.SP.C.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | | MA.7.SP.C.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | | MA.7.SP.C.8a | Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | | MA.7.SP.C.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. | | MA.7.SP.C.8c | Design and use a simulation to generate frequencies for compound events. | | MA.7.SP.A | Use random sampling to draw inferences about a population. | | MA.7.SP.A.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | | MA.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. | | MA.7.SP.B | Draw informal comparative inferences about two populations. | | MA.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. | | MA.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. | | MA.7.SP.C | Investigate chance processes and develop, use, and evaluate probability models. | | MA.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. | |

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| **Career Ready Practices** |
| 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.  CRP12.   Work productively in teams while using cultural global competence. |

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| **Essential Questions** |
| * How can the likelihood of the occurrence of an event be expressed? * How can the theoretical probability of an event be predicted? * Can the theoretical probability of an event be compared to the experimental probability using a simulation? * How can the probability of compound events be calculated? * How can the outcomes of compound events be represented? * What methods can be used to express the likelihood of an occurrence? * How can be predict the winner of a school based election on randomly sampled survey data? * How can we compare experimental and theoretical probability using a simulation? * How can fractions be used to calculate the probability of compound events? * How can you represent the outcome of a compound event? |

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| **Enduring Understanding** |
| * The likelihood of the occurrence of an event can be expressed by a number between 0 and 1. * Computing theoretical probability can predict the frequencies of an event. * Simulations can be designed to compare theoretical to experimental probability of simple or compound events. * The probability of a compound event is the addition or multiplication of fractions depending upon replacement. * How to determine the probability of an event. * How to predict the frequencies of an event using probability. * The simulations that can be created to compare theoretical and experimental probabilities. * How fractions can be used to determine the probability of compound events. * The techniques that can be used to represent outcomes of compound events. |

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| **Students will know...** |
| * How to determine the probability of an event. * How to predict the frequencies of an event using probability. * The simulations that can be created to compare theoretical and experimental probabilities. * How to use fractions to determine the probability of compound events. * The techniques that can be used to represent outcomes of compound events. |

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| **Students will be able to...** |
| * The likelihood of the occurrence of an event can be expressed by a number between 0 and 1. * Computing theoretical probability can predict the frequencies of an event. * Simulations can be designed to compare theoretical to experimental probability of simple or compound events. * The probability of a compound event is the addition or multiplication of fractions depending upon replacement. |

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| **STAGE 2- EVIDENCE OF LEARNING** |
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| **Formative Assessment Suggestions** |
| 3- Minute Pause  Analogy Prompt  Choral Response  Debriefing  Exit Card / Ticket  Hand Signals  Index card summaries  Journal Entry  Misconception Check  Observation  Portfolio Check  Questions & Answers  Quiz  Self-Assessment  Student Conference  Think-Pair-Share  Think-Ink-Share  Web or Concept Map   |  |  | | --- | --- | | • 3- Minute Pause | **.** | | • A-B-C Summaries | **.** | | • Analogy Prompt | **.** | | • Choral Response | **.** | | • Debriefing | **.** | | • Exit Card / Ticket | **.** | | • Hand Signals | **.** | | • Idea Spinner | **.** | | • Index Card Summaries | **.** | | • Inside-Outside Circle Discussion (Fishbowl) | **.** | | • Journal Entry | **.** | | • Misconception Check | **.** | | • Observation | **.** | | • One Minute Essay | **.** | | • One Word Summary | **.** | | • Portfolio Check | **.** | | • Questions & Answers | **.** | | • Quiz | **.** | | • Self-Assessment | **.** | | • Student Conference | **.** | | • Think-Pair-Share | **.** | | • Web or Concept Map | **.** | |

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| **Authentic Assessments Suggestions** |
| Through the following authentic assessments, students will develop traits regarding thinking and reasoning, settings, mathematical tools and attitudes and dispositions:  1. Performance Assessments  2. Short Investigations  3. Open Ended Response Questions  4.  Portfolios  5.  Self-Assessments |

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| **Benchmark Assessments** |
| Math 7 Honors  Pearson Realize -- Topics 1-3: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-9: Cumulative/Benchmark Assessment  Pearson Realize -- End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Spring Administration  Math 7  Pearson Realize -- Topics 1-2: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-4: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize -- End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration |

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| **STAGE 3- LEARNING PLAN** |
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| **Instructional Map** |
| **Step 1: What is it we want and expect students to learn?**   * Read domain overview, learning goal, and essential questions to gain an initial understanding of the domain. * Analyze cluster of standards, vertical progression, test item specifications to determine full intent of standards (DOK) and student outcomes. * Determine measurable objectives using unpacked standards. Review the assessments for determining acceptable evidence.   **Step 2: How will they learn it?**   * Select problem-based learning/formative assessment tasks. * Develop learning experiences utilizing the textbook and selected tasks along with higher order questions stems.   **Step 3: How will we know when they have learned it?**   * As a PLC, analyze students’ work reflecting on teacher practice and provide student feedback. * Provide additional assessments as necessary and collaboratively analyze the results.   **Step 4: How will we respond if they don’t learn it? How will we respond to those who already know it?**   * Using data analysis, develop small groups for enrichment and remediation. * Reassess student performance and provide opportunities for application. |

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| **Modifications/Differentiation of Instruction** |
| Differentiation Strategies for Special Education Students   * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate   Differentiation Strategies for Gifted and Talented Students   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas   Differentiated Strategies for ELL Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials, including visuals * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Allow students to work at their own pace * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Role play * Provide graphic organizers, highlighted materials * Strategy and flexible groups based on formative assessment   Differentiation Strategies for At Risk Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits * occupational or physical therapy |

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| **Modification Strategies** |
| |  |  | | --- | --- | | • Extended Time | **.** | | • Frequent Breaks | **.** | | • Highlighted Text | **.** | | • Interactive Notebook | **.** | | • Modified Test | **.** | | • Oral Directions | **.** | | • Peer Tutoring | **.** | | • Preferential Seating | **.** | | • Re-Direct | **.** | | • Repeated Drill / Practice | **.** | | • Shortened Assignments | **.** | | • Teacher Notes | **.** | | • Tutorials | **.** | | • Use of Additional Reference Material | **.** | | • Use of Audio Resources | **.** | |

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| **High Preparation Differentiation** |
| |  |  | | --- | --- | | • Alternative Assessments | **.** | | • Choice Boards | **.** | | • Games and Tournaments | **.** | | • Group Investigations | **.** | | • Guided Reading | **.** | | • Independent Research / Project | **.** | | • Interest Groups | **.** | | • Learning Contracts | **.** | | • Leveled Rubrics | **.** | | • Literature Circles | **.** | | • Menu Assignments | **.** | | • Multiple Intelligence Options | **.** | | • Multiple Texts | **.** | | • Personal Agendas | **.** | | • Project Based Learning (PBL) | **.** | | • Stations / Centers | **.** | | • Think-Tac-Toe | **.** | | • Tiered Activities / Assignments | **.** | | • Varying Graphic Organizers | **.** | |

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| **Low Preparation Differentiation** |
| |  |  | | --- | --- | | • Choice of Book / Activity | **.** | | • Cubing Activities | **.** | | • Exploration by Interest (using interest inventories) | **.** | | • Flexible Grouping | **.** | | • Goal Setting With Student | **.** | | • Homework Options | **.** | | • Jigsaw | **.** | | • Mini Workshops to Extend Skills | **.** | | • Mini Workshops to Re-teach | **.** | | • Open-ended Activities | **.** | | • Think-Pair-Share by Interest | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Readiness | **.** | | • Use of Collaboration | **.** | | • Use of Reading Buddies | **.** | | • Varied Journal Prompts | **.** | | • Varied Product Choice | **.** | | • Varied Supplemental Materials | **.** | | • Work Alone / Together | **.** | |

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| **Vertical Integration- Discipline Mapping** |
| Statistics and Probability Vertical Alignment  In Grade 6 Students will be able to do...   * Develop understanding of statistical variability. * Summarize and describe distributions.   In Grade 7 Students will be able to do...   * Use random sampling to draw inferences about a population. * Draw informal comparative inferences about two populations. * Investigate chance processes and develop, use, and evaluate probability models.   In Grade 8 Students will be able to do...   * Investigate patterns of association in bivariate data. |

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| **Additional Materials** |
| * LPS Adopted Textbooks and Programs   + Pearson EnVision Grade 7 Mathematics Text   + Pearson Realize (Computer Based program supplementing EnVision) * Edmentum Exact Path * NJSLA Released Items * Khan Academy   **Unit #5: Geometry**  Content Area: **Mathematics** Course(s): **Math 7** Time Period: **Marking Period 4** Length: **20 Days** Status: **Published**   |  | | --- | | **Unit Overview** | | This unit is aligned to the following topic: *Solve Problems Involving Geometry*.  1. Students will be able to solve proportions involving scale drawings, draw geometric shapes using a ruler, protractor, technology and free hand.  2. Students will state the shape formed when a 3-D figure is intersected by a plane.  3. Students will solve problems involving circles.  4. Find the missing angle measure form given information, use formulas for area, surface area and volume.  5. Students will solve problems involving triangles.  6. Students will find angle measures from parallel lines that are intersected by a transversal. |  |  | | --- | | **STAGE 1- DESIRED RESULTS** | |  |  |  | | --- | | **Educational Standards** | | The following goals, as outlined in the NJSLS, will provide a framework for preparation and instruction in mathematics. They make up the eight mathematical practice standards:  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. |  |  | | --- | | **New Jersey Student Learning Standards- Mathematics** | |  |  |  | | --- | | **Introduction- Grade 7** | | |  |  | | --- | --- | | MA.7.7 | In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. | | MA.7.7.1 | Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships. | | MA.7.7.2 | Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. 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In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | MA.7.7.4 | Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. | |  |  | | --- | | **Ratios and Proportional Relationships** | | |  |  | | --- | --- | | MA.7.RP.A | Analyze proportional relationships and use them to solve real-world and mathematical problems. | | MA.7.RP.A.1 | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. | | MA.7.RP.A.2 | Recognize and represent proportional relationships between quantities. | | MA.7.RP.A.2a | Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. | | MA.7.RP.A.2b | Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | | MA.7.RP.A.2c | Represent proportional relationships by equations. | | MA.7.RP.A.2d | Explain what a point (𝑥, 𝑦) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, 𝑟) where 𝑟 is the unit rate. | | MA.7.RP.A.3 | Use proportional relationships to solve multistep ratio and percent problems. | |  |  | | --- | | **The Number System** | | |  |  | | --- | --- | | MA.7.NS.A.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. | | MA.7.NS.A | Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | | MA.7.NS.A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. | | MA.7.NS.A.1a | Describe situations in which opposite quantities combine to make 0. | | MA.7.NS.A.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. | | MA.7.NS.A.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. | | MA.7.NS.A.1d | Apply properties of operations as strategies to add and subtract rational numbers. | | MA.7.NS.A.2 | Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. | | MA.7.NS.A.2a | Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. | | MA.7.NS.A.2b | Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.If 𝑝 and 𝑞 are integers, then –(𝑝/𝑞) = (–𝑝)/𝑞 = 𝑝/(–𝑞). Interpret quotients of rational numbers by describing real-world contexts. | | MA.7.NS.A.2c | Apply properties of operations as strategies to multiply and divide rational numbers. | | MA.7.NS.A.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. | |  |  | | --- | | **Expressions and Equations** | | |  |  | | --- | --- | | MA.7.EE.B.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. | | MA.7.EE.B.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. | | MA.7.EE.A | Use properties of operations to generate equivalent expressions. | | MA.7.EE.A.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | | MA.7.EE.A.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. | | MA.7.EE.B | Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | | MA.7.EE.B.3 | Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | | MA.7.EE.B.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. | |  |  | | --- | | **Geometry** | | |  |  | | --- | --- | | MA.7.G.A | Draw, construct, and describe geometrical figures and describe the relationships between them. | | MA.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. | | MA.7.G.A.2 | Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | | MA.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. | | MA.7.G.B | Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. | | MA.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. | | MA.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. | | MA.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. | |  |  | | --- | | **Statistics and Probability** | | |  |  | | --- | --- | | MA.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. | | MA.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. | | MA.7.SP.C.7a | Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. | | MA.7.SP.C.7b | Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. | | MA.7.SP.C.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | | MA.7.SP.C.8a | Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. | | MA.7.SP.C.8b | Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event. | | MA.7.SP.C.8c | Design and use a simulation to generate frequencies for compound events. | | MA.7.SP.A | Use random sampling to draw inferences about a population. | | MA.7.SP.A.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | | MA.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. | | MA.7.SP.B | Draw informal comparative inferences about two populations. | | MA.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. | | MA.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. | | MA.7.SP.C | Investigate chance processes and develop, use, and evaluate probability models. | | MA.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. | |  |  | | --- | | **Career Ready Practices** | | 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.  CRP12.   Work productively in teams while using cultural global competence. |  |  | | --- | | **Essential Questions** | | * How can proportions be used to solve scale drawings? * How can geometric shapes be drawn to meet given conditions? * How can geometric facts and formulas be used to solve real world situations? * How can you draw a geometric shape using the scalar factor? * What tools can you use to draw geometric shapes? * How many square yards of carpeting will be needed to cover a room’s floor? |  |  | | --- | | **Enduring Understanding** | | * Proportions can be used to solve problems involving scale drawings. * Geometric shapes can be drawn using a variety of tools to meet given conditions. * Geometric formulas can be used to solve mathematical problems for two and three dimensional figures. * Facts about angles relationships can be used to solve real world situations. * How proportions are used to solve problems involving scale. * The tools that can be used to construct geometric shapes. * How to solve real life problems using area and surface area. * How angles are used in real world situations. |  |  | | --- | | **Students will know...** | | * How proportions are used to solve problems involving scale. * The tools that can be used to construct geometric shapes. * How to solve real life problems using area and surface area. * How angles are used in real world situations. |  |  | | --- | | **Students will be able to...** | | * Proportions can be used to solve problems involving scale drawings. * Geometric shapes can be drawn using a variety of tools to meet given conditions. * Geometric formulas can be used to solve mathematical problems for two and three dimensional figures. |  |  | | --- | | **STAGE 2- EVIDENCE OF LEARNING** | |  |  |  | | --- | | **Formative Assessment Suggestions** | | 3- Minute Pause  Analogy Prompt  Choral Response  Debriefing  Exit Card / Ticket  Hand Signals  Index card summaries  Journal Entry  Misconception Check  Observation  Portfolio Check  Questions & Answers  Quiz  Self-Assessment  Student Conference  Think-Pair-Share  Think-Ink-Share  Web or Concept Map   |  |  | | --- | --- | | • 3- Minute Pause | **.** | | • A-B-C Summaries | **.** | | • Analogy Prompt | **.** | | • Choral Response | **.** | | • Debriefing | **.** | | • Exit Card / Ticket | **.** | | • Hand Signals | **.** | | • Idea Spinner | **.** | | • Index Card Summaries | **.** | | • Inside-Outside Circle Discussion (Fishbowl) | **.** | | • Journal Entry | **.** | | • Misconception Check | **.** | | • Observation | **.** | | • One Minute Essay | **.** | | • One Word Summary | **.** | | • Portfolio Check | **.** | | • Questions & Answers | **.** | | • Quiz | **.** | | • Self-Assessment | **.** | | • Student Conference | **.** | | • Think-Pair-Share | **.** | | • Web or Concept Map | **.** | |  |  | | --- | | **Authentic Assessments Suggestions** | | Through the following authentic assessments, students will develop traits regarding thinking and reasoning, settings, mathematical tools and attitudes and dispositions:  1. Performance Assessments  2. Short Investigations  3. Open Ended Response Questions  4.  Portfolios  5.  Self-Assessments |  |  | | --- | | **Benchmark Assessments** | | Math 7 Honors  Pearson Realize -- Topics 1-3: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-9: Cumulative/Benchmark Assessment  Pearson Realize -- End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration    Math 7  Pearson Realize -- Topics 1-2: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-4: Cumulative/Benchmark Assessment  Pearson Realize -- Topics 1-6: Cumulative/Benchmark Assessment  Pearson Realize -- End-Of-Year Assessment  Edmentum Fall Administration  Edmentum Winter Administration  Edmentum Spring Administration |  |  | | --- | | **STAGE 3- LEARNING PLAN** | |  |  |  | | --- | | **Instructional Map** | | **Step 1: What is it we want and expect students to learn?**   * Read domain overview, learning goal, and essential questions to gain an initial understanding of the domain. * Analyze cluster of standards, vertical progression, test item specifications to determine full intent of standards (DOK) and student outcomes. * Determine measurable objectives using unpacked standards. Review the assessments for determining acceptable evidence.   **Step 2: How will they learn it?**   * Select problem-based learning/formative assessment tasks. * Develop learning experiences utilizing the textbook and selected tasks along with higher order questions stems.   **Step 3: How will we know when they have learned it?**   * As a PLC, analyze students’ work reflecting on teacher practice and provide student feedback. * Provide additional assessments as necessary and collaboratively analyze the results.   **Step 4: How will we respond if they don’t learn it? How will we respond to those who already know it?**   * Using data analysis, develop small groups for enrichment and remediation. * Reassess student performance and provide opportunities for application. |  |  | | --- | | **Modifications/Differentiation of Instruction** | | Differentiation Strategies for Special Education Students   * Remove unnecessary material, words, etc., that can distract from the content * Use of off-grade level materials * Provide appropriate scaffolding * Limit the number of steps required for completion * Time allowed * Level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Varied homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Ability to work at their own pace * Present ideas using auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment * Differentiated checklists and rubrics, if available and appropriate       Differentiation Strategies for Gifted and Talented Students   * Increase the level of complexity * Decrease scaffolding * Variety of finished products * Allow for greater independence * Learning stations, interest groups * Varied texts and supplementary materials * Use of technology * Flexibility in assignments * Varied questioning strategies * Encourage research * Strategy and flexible groups based on formative assessment or student choice * Acceleration within a unit of study * Exposure to more advanced or complex concepts, abstractions, and materials * Encourage students to move through content areas at their own pace * After mastery of a unit, provide students with more advanced learning activities, not more of the same activity * Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas   Differentiated Strategies for ELL Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials, including visuals * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language. * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Allow students to work at their own pace * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Role play * Provide graphic organizers, highlighted materials * Strategy and flexible groups based on formative assessment   Differentiation Strategies for At Risk Students   * Remove unnecessary materials, words, etc., that can distract from the content * Provide appropriate scaffolding * Limit the number of steps required for completion * Gradually increase the level of independence required * Tiered centers, assignments, lessons, or products * Provide appropriate leveled reading materials * Deliver the content in “chunks” * Varied texts and supplementary materials * Use technology, if available and appropriate * Differentiate homework and products * Varied questioning strategies * Provide background knowledge * Define key vocabulary, multiple-meaning words, and figurative language * Use audio and visual supports, if available and appropriate * Provide multiple learning opportunities to reinforce key concepts and vocabulary * Meet with small groups to reteach idea/skill * Provide cross-content application of concepts * Presenting ideas through auditory, visual, kinesthetic, & tactile means * Provide graphic organizers and/or highlighted materials * Strategy and flexible groups based on formative assessment   **504 Plans**  Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:   * walk, breathe, eat, or sleep * communicate, see, hear, or speak * read, concentrate, think, or learn * stand, bend, lift, or work   Examples of accommodations in 504 plans include:   * preferential seating * extended time on tests and assignments * reduced homework or classwork * verbal, visual, or technology aids * modified textbooks or audio-video materials * behavior management support * adjusted class schedules or grading * verbal testing * excused lateness, absence, or missed classwork * pre-approved nurse's office visits and accompaniment to visits * occupational or physical therapy |  |  | | --- | | **Modification Strategies** | | |  |  | | --- | --- | | • Extended Time | **.** | | • Frequent Breaks | **.** | | • Highlighted Text | **.** | | • Interactive Notebook | **.** | | • Modified Test | **.** | | • Oral Directions | **.** | | • Peer Tutoring | **.** | | • Preferential Seating | **.** | | • Re-Direct | **.** | | • Repeated Drill / Practice | **.** | | • Shortened Assignments | **.** | | • Teacher Notes | **.** | | • Tutorials | **.** | | • Use of Additional Reference Material | **.** | | • Use of Audio Resources | **.** | |  |  | | --- | | **High Preparation Differentiation** | | |  |  | | --- | --- | | • Alternative Assessments | **.** | | • Choice Boards | **.** | | • Games and Tournaments | **.** | | • Group Investigations | **.** | | • Guided Reading | **.** | | • Independent Research / Project | **.** | | • Interest Groups | **.** | | • Learning Contracts | **.** | | • Leveled Rubrics | **.** | | • Literature Circles | **.** | | • Menu Assignments | **.** | | • Multiple Intelligence Options | **.** | | • Multiple Texts | **.** | | • Personal Agendas | **.** | | • Project Based Learning (PBL) | **.** | | • Stations / Centers | **.** | | • Think-Tac-Toe | **.** | | • Tiered Activities / Assignments | **.** | | • Varying Graphic Organizers | **.** | |  |  | | --- | | **Low Preparation Differentiation** | | |  |  | | --- | --- | | • Choice of Book / Activity | **.** | | • Cubing Activities | **.** | | • Exploration by Interest (using interest inventories) | **.** | | • Flexible Grouping | **.** | | • Goal Setting With Student | **.** | | • Homework Options | **.** | | • Jigsaw | **.** | | • Mini Workshops to Extend Skills | **.** | | • Mini Workshops to Re-teach | **.** | | • Open-ended Activities | **.** | | • Think-Pair-Share by Interest | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Learning Style | **.** | | • Think-Pair-Share by Readiness | **.** | | • Use of Collaboration | **.** | | • Use of Reading Buddies | **.** | | • Varied Journal Prompts | **.** | | • Varied Product Choice | **.** | | • Varied Supplemental Materials | **.** | | • Work Alone / Together | **.** | |  |  | | --- | | **Vertical Integration- Discipline Mapping** | | Geometry Vertical Alignment  In Grade 6 Students will be able to do...   * Solve real-world and mathematical problems involving area, surface area, and volume.   In Grade 7 Students will be able to do...   * Draw, construct and describe geometrical figures and describe the relationships between them. * Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.   In Grade 8 Students will be able to do...   * Understand congruence and similarity using physical models, transparencies, or geometry software. * Understand and apply the Pythagorean Theorem. * Solve real-world and mathematical problems involving volume of cylinders, cones and spheres. |  |  | | --- | | **Additional Materials** | | * LPS Adopted Textbooks and Programs   + Pearson EnVision Grade 7 Mathematics Text   + Pearson Realize (Computer Based program supplementing EnVision) * Edmentum Exact Path * NJSLA Released Items * Khan Academy | |

**Unit Specific Interdisciplinary Connections / Materials**

With interdisciplinary instruction, the subject areas are woven together and explored through an overarching theme or concept. We use math to help us solve everyday problems in the kitchen, in the garden, and for many of us at our jobs.

Brain research has shown that information in our brains is organized in schematic structures. These structures are made up of interconnected bits of information and serve as a framework for the knowledge we acquire. When a learner’s knowledge is connected, it is much more likely that they will apply the prior knowledge to a wide variety of new situations. They will acquire new information in a way that is more accessible and will be better able to relate it to previously acquired knowledge.

Students learn about patterns in math, science, social studies, and even literature. Because of this, they are much more likely to “see” these patterns when they encounter new situations. Since patterns are not only studied in math they are able to make the connection and gain the understanding that patterns can be found in many areas of their lives. Interdisciplinary instruction allows students to understand the interconnectedness of the disciplines and makes learning more meaningful and relevant as fascinating connections are made across the subject areas.

**Science**

MS-PS3-5 Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

**Language Arts**

RL.7.1. Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.7.1. Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

**Social Studies**

6.1.8.EconET.3.a: Identify the effect of inflation and debt on the American people and evaluate the policies of state and national governments during this time.

6.1.12.EconNE.6.a: Analyze the impact of money, investment, credit, savings, debt, and financial institutions on the development of the nation and the lives of individuals.