

Pascack Valley Regional High School District

**Pascack Hills High School, Montvale, New Jersey
Pascack Valley High School, Hillsdale, New Jersey**

**Course Name: Math 1 - 4
Grades: 9 - 12**

Born On: August, 2019
Previous Revision: August, 2020
Current Revision: August, 2023
Board Approval: 8/28/23

COURSE DESCRIPTION: Math 1-4

In Math 1-4, students will demonstrate increasingly complex understanding of number sense, spatial reasoning, geometric principles, measurement, data, and analytic procedures. In addition, students will solve increasingly complex mathematical problems, making productive use of algebra and functions. The Math 1-4 curriculum is aligned with the Dynamic Learning Maps Essential Elements, which are intended to build a bridge from the content in the New Jersey Student Learning Standards to academic expectations for students with the most significant cognitive disabilities.

To accomplish the task of building understanding within this curriculum, students will participate in various types of activities and lessons that are designed to address different learning styles and personalities. Students will take part in engaging hands-on scientific and mathematical experiments, collaborative educational games, and teacher-facilitated group discussions. Students are encouraged to analyze data using tools and models to make valid and reliable claims (9.4.12.IML.3), and various technologies are integrated throughout the curriculum. This course will target multiple levels and styles of learning, and encourage a collaborative, engaging, and appropriately rigorous environment, with appropriate accommodations and modifications made for students with disabilities, multilingual students, students at risk of failure, gifted and talented students, and students with 504 plans.

The Pascack Valley Regional High School Mathematics Department integrates 21st century life and career skills across its courses, with the dual goal of informing students about careers and fields of study that use mathematics (9.3.ST.5, 9.3.ST-ET.5 and 9.3.ST-SM.2), and helping students improve the quantitative, mathematical, and statistical reasoning skills they will need to be effective producers and consumers of quantitative information in their everyday lives (9.2.12.CAP.2). Mathematics courses address the *New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills*, with a particular emphasis on demonstrating the ability to reflect, analyze and use creative skills and ideas (9.4.12.CI.1), investigating new challenges and opportunities for personal growth, advancement and transition (9.4.12.CI.3), identifying problem-solving strategies used in the development of an innovative product or practice (9.4.12.CT.1), and explaining the potential benefits of collaborating to enhance critical thinking and problem solving (9.4.12.CT.2). Mathematics courses also address the *New Jersey Student Learning Standards for English Language Arts Companion Standards*, with a particular focus on following complex multistep procedures (RST.9-10.3/RST.11-12.3), determining the meaning of symbols, key terms, and other domain-specific words and phrases (RST.9-10.4/RST.11-12.3), and translating quantitative or technical information expressed in words into visual forms and translating information expressed visually or mathematically into words (RST.9-10.7). Similarly, the mathematics department seeks to support students by providing them with opportunities to use quantitative, statistical, and mathematical reasoning in interdisciplinary contexts, in contexts that are meaningful to students, and in contexts that attend to the contributions and perspectives of historically marginalized groups. Specifically, mathematics courses will look to incorporate, when appropriate,

contributions and experiences of people from the LGBTQ+ community and individuals with disabilities, and references to issues of social and cultural relevance, including climate change.

Unit 1 – Numbers and Operations

Allotted: Approximately 10 Weeks

Jersey Student Learning Standards (NJSL)

1.1 Understand number structures (counting, place value, fractions) (3-4 weeks)

1.2 Compare, compose, and decompose numbers and sets (3-4 weeks)

1.3 Calculate accurately and efficiently using simple arithmetic operations (3-4 weeks)

Essential Questions	Student Learning Objectives/NJSL	Suggested Tasks/Activities	Evidence of Learning (Assessments)
<p>Why is our knowledge of operations important in everyday life?</p>	<p>NJSL Content Standards</p> <p>MC 1.1:</p> <p>1.OA.3. Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a 10, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.) EE.N-CN.2. REVIEW (LLD Math 1)</p> <p>3.OA.5. Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.) EE.N-CN.2.</p>	<ul style="list-style-type: none"> - Create and utilize a graphic organizer of our four basic operations as a reference tool <ul style="list-style-type: none"> - Inclusion of an example for each operation - Addition and subtraction problems - Real world application of addition and subtraction word problems (money) - Multiplication and Division problems - Real world application of addition and subtraction word problems (money) - Number Talks 	<ul style="list-style-type: none"> - Projects (S) - Quizzes (F, S) - Classwork (F) <ul style="list-style-type: none"> - Individual and collaborative work - Homework (F) - CBI Trips (F) - Alternate Assessments (A) - DLM Tasks (F, B)

REVIEW (LLD Math 2)

4.OA.1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

4.OA.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

EE.4.OA.1-2. (LLD Math 3 & 4)

7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.

7.RP.2. Recognize and represent proportional relationships between quantities

7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. EE.7.RP.1–3.

8.NS.2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. EE.8.NS.2.a.

MC 1.2:

4.NBT.1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division. EE.5.NBT.1. (LLD Math 1 & 2)

5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left. EE.5.NBT.1.

5.NBT.3. Read, write, and compare decimals to thousandths. EE.5.NBT.3.

5.NBT.3.b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. EE.5.NBT.3.

5.NBT.4. Use place value understanding to round decimals to any place. EE.5.NBT.4.

(LLD Math 3 & 4)

7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers.
EE.7.NS.3.

8.EE.3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.

8.EE.4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation, and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
EE.8.EE.3–4.

MC 1.3:

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
EE.5.NBT.5. (LLD Math 1)

4.NF.4.c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie? EE.5.NBT.5. (LLD Math 2)

3.OA.6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8. (LLD Math 2)

5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.EE.5.NBT.5.

5.NBT.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.EE.5.NBT.6
(LLD Math 3 &4)

7.NS.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition

and subtraction on a horizontal or vertical number line diagram.

EE.7.NS.1.

7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

EE.7.NS.2.a-b.

8.NS.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. EE.8.NS.1.

8.EE.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. EE.8.EE.1.

N-CN.2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. EE.N-CN.2.a-c.

N-RN.1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the

	<p>cube root of 5 because we want $(5^{1/3})^3 = 5(1/3)^3$ to hold, so $(5^{1/3})^3$ must equal 5. EE.N-RN.1.</p> <p>NJSLS SMP</p> <p>MP1. Make sense of problems and persevere in solving them MP2. Construct viable arguments and critique the reasoning of others MP3. Reason abstractly and quantitatively MP4. Model with mathematics MP5. Attend to precision MP6. Use appropriate tools strategically MP7. Look for and make use of structure MP8. Look for and express regularity in repeated reasoning</p>		
Resources/Materials	<ul style="list-style-type: none"> - Texts: teacher-created resources (on grade level); Pearson Algebra I Common Core (advanced); IXL (remediation, on grade level, and advanced) - Base 10 Blocks 		
Disciplinary/Additional Connections	<ul style="list-style-type: none"> - An understanding of basic number sense is essential for applying mathematics to real life applications. Numbers are all around us. Students will use their number sense knowledge when dealing with money (totaling up prices, calculating change, etc.) , telling time, measuring (in Culinary Arts class), etc. - Teachers will draw on contexts that draw on the experiences of diverse people, and will seek out applications to climate change, when appropriate. 		
21st Century Life and Careers (LS-CLKS)	<p>- 21st Century Life and Careers</p> <p>9.4.12.Cl.1 9.4.12.Cl.3 9.4.12.Ct.1 9.4.12.Ct.2</p> <p>- Technology</p> <p>9.4.12.IML.3</p> <p>- Career Education</p> <p>9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2</p> <ul style="list-style-type: none"> ● To engage students in meaningful mathematical discourse to build shared understanding of 		

	<p>mathematical ideas by analyzing and comparing student approaches and arguments.</p> <ul style="list-style-type: none"> To support students in productive struggle in learning mathematics. Students will engage in productive struggle as they grapple with mathematical ideas and relationships.
Technology Standards/CS – CSDT	<p>8.1.P.A.1 Use an input device to select an item and navigate the screen.</p> <p>8.1.P.A.2 Navigate the basic functions of a browser.</p> <p>8.1.P.A.3 Use digital devices to create stories with pictures, numbers, letters and words.</p> <p>8.1.P.A.4 Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer).</p> <p>8.1. P.A.5 Demonstrate the ability to access and use resources on a computing device.</p> <p>8.1.12.DA.1</p> <p>8.1.12.DA.5</p> <p>8.1.12.DA.6</p> <p>8.1.12.AP.1</p> <p>8.2.12.ETW.2</p>
Standards for ELA Companion Standards	<p>RST.9-10.3</p> <p>RST.9-10.4</p> <p>RST.9-10.7</p> <p>RST.11-12.3</p> <p>RST.11-12.4</p>

Content-Specific Modifications and Accommodations

Special Education	At-Risk
<ul style="list-style-type: none"> Large print materials Additional time for assignments Review of directions Have students restate information Concrete examples Use visuals to support instruction Verbal cues and prompts Graph paper to assist in organizing or lining up math problems Frequent check-ins 	<ul style="list-style-type: none"> Incorporate student choice Provide peer mentoring to improve understanding of the material.

Additional Modifications and Accommodations

Students with special needs: Teachers and support staff will attend to all modifications and accommodations listed in students' IEPs and 504s. Teachers will incorporate manipulatives, extra time, alternative assessments, scaffolding, spiraling, technology, and flexible grouping to support student learning.

Multilingual students: Teachers and support staff will work to support multilingual students in their first language and in English, providing materials and/or resources to support students' understanding. Students will be given additional time, as appropriate, and translation tools will be used as needed.

Students at risk of school failure:

Formative and summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services. Intervention may include parent consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and modeling.

Gifted and Talented Students: Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions of concepts and skills, and extended problem solving and critical thinking opportunities.

Unit 2: – Measurement and Data

Duration: Approximately 10 Weeks

Student Learning Standards (NJSLS)

Understand and use measurement principles and units of measure (4-5 weeks)

Represent and interpret data displays (4-5 weeks)

Essential Questions	Student Learning Objectives/NJSLS	Suggested Tasks/Activities	Evidence of Learning (Assessments)
<p>Why does measurement and why do they play a part in our day-to-day lives?</p> <p>What are the different measurement tools?</p> <p>How do I make sure I have enough money to spend at the store?</p> <p>Why is it important to maintain a budget?</p>	<p>NJSLS Content Standards</p> <p>MC 3.1:</p> <p>1.MD.1. Order three objects by length; compare the lengths of two objects indirectly by using a third object. EE.1.MD.1–2. (LLD Math 1)</p> <p>EE.2.MD.8. Recognize that money has value. E.2.MD.8. (LLD Math 1)</p> <p>2.MD.1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. EE.2.MD.1. (LLD Math 2)</p> <p>2.MD.4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. EE.2.MD.3-4. (LLD Math 2)</p> <p>2.MD.5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such</p>	<ul style="list-style-type: none"> - Introduction of each measurement tool - Practice measuring different items using the different measurement tools. - Identifying which measurement tool is best to measure a certain object - Complete measurement word problems - Graphing measurement data <ul style="list-style-type: none"> - (bar graphs, line graphs) - Interpreting measurement data - Identifying coins - Value of coins - Calculating correct change - Maintaining a budget 	<ul style="list-style-type: none"> - Projects (S) - Quizzes (F, S) - Classwork (F) <ul style="list-style-type: none"> - Individual and collaborative - Homework (F) - CBI Trips (F) - Alternate Assessments - DLM Tasks (F, B)

as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. EE.2.MD.5. (LLD Math 2)

2.MD.7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.EE.2.MD.7. (LLD Math 2)

2.MD.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have? EE.2.MD.8. (LLD Math 2)

3.MD.1. Tell and write time to the nearest minute, and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.EE.3.MD.1. (LLD Math 3)

3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). 14 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.1EE.3.MD.2. (LLD Math 3)

4.MD.1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...EE.4.MD.1. (LLD Math 4)

4.MD.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. EE.4.MD.2.a-d (LLD Math 4)

N-Q.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.N-Q.3. Choose a level of accuracy

appropriate to limitations on measurement when reporting quantities. EE.N-Q.1–3.

MC 3.2:

1.MD.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. EE.1.MD.4. (LLD Math 1)

2.MD.9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. (LLD Math 2)

2.MD.10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take apart, and compare problems using information presented in a bar graph. EE.2.MD.9-10. (LLD Math 2)

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph

might represent 5 pets.EE.3.MD.3. (LLD Math 3)

4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection. EE.4.MD.4.a.-b (LLD Math 5)

7.SP.1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

	<p>EE.7.SP.1–2.</p> <p>8.SP.4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores? EE.8.SP.4.</p> <p>NJSLS SMP</p> <p>MP1. Make sense of problems and persevere in solving them MP2. Construct viable arguments and critique the reasoning of others MP3. Reason abstractly and quantitatively MP4. Model with mathematics MP5. Attend to precision MP6. Use appropriate tools strategically MP7. Look for and make use of structure MP8. Look for and express regularity in repeated reasoning</p>		
<p>Materials</p>	<ul style="list-style-type: none"> ● Texts: teacher-created resources (on grade level); Pearson Algebra I Common Core (advanced); IXL (on grade level, and advanced) ● Measurement tools (rulers, tape measure, measuring cups, etc.) ● Items to measure ● Money ● Worksheets- www.superteachers.com or www.mathworksheets4kids.com ● Fraction tiles 		

ary/Additional	<ul style="list-style-type: none"> - An understanding of measurement and data is essential in day-to-day life. For example, maintaining a checking account, budgeting money, paying bills, telling time, cooking (Culinary Arts class), and in architecture and design. - Teachers will draw on contexts that draw on the experiences of diverse people, and will seek out appropriate climate change, when appropriate.
Life and Careers (S)	<p>- 21st Century Life and Careers</p> <p>9.4.12.CI.1 9.4.12.CI.3 9.4.12.CT.1 9.4.12.CT.2</p> <p>- Technology</p> <p>9.4.12.IML.3</p> <p>- Career Education</p> <p>9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2</p> <ul style="list-style-type: none"> ● To engage students in meaningful mathematical discourse to build shared understanding of mathematics by analyzing and comparing student approaches and arguments. ● To support students in productive struggle in learning mathematics. Students will engage in productive struggle as they grapple with mathematical ideas and relationships.
Standards/DT	<p>8.1.P.A.1 Use an input device to select an item and navigate the screen.</p> <p>8.1.P.A.2 Navigate the basic functions of a browser.</p> <p>8.1.P.A.3 Use digital devices to create stories with pictures, numbers, letters and words.</p> <p>8.1.P.A.4 Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer).</p> <p>8.1. P.A.5 Demonstrate the ability to access and use resources on a computing device.</p> <p>8.1.12.DA.1 8.1.12.DA.5 8.1.12.DA.6 8.1.12.AP.1 8.2.12.ETW.2</p>
LA Companion Standards	<p>RST.9-10.3 RST.9-10.4</p>

RST.9-10.7
RST.11-12.3
RST.11-12.4

Content-Specific Modifications and Accommodations

Special Education	At-Risk
e print materials Additional time for assignments Review of directions Have students restate information Provide concrete examples Use visuals to support instruction Use visual cues and prompts Use graph paper to assist in organizing or lining up math problems Frequent check-ins	<ul style="list-style-type: none">● Incorporate student choice● Provide peer mentoring to improve understanding of the material

Additional Modifications and Accommodations

For students with special needs: Teachers and support staff will attend to all modifications and accommodations listed in students' IEPs and 504s. Teachers will use manipulatives, extra time, alternative assessments, scaffolding, spiraling, technology, and flexible grouping to support student learning.

For multilingual students: Teachers and support staff will work to support multilingual students in their first language and in English, providing materials and support to help support students' understanding. Students will be given additional time, as appropriate, and translation tools will be utilized as needed.

For students at risk of school failure:

Formative and summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services, which may include frequent consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and spiraling.

For Gifted and Talented Students: Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions, and extended problem solving and critical thinking opportunities.

Unit 3: Algebraic Thinking

Duration: Approximately 10 Weeks

Student Learning Standards (NJSLS)

Use increasingly complex mathematical problems, making productive use of algebra.

Use operations and models to solve problems (4-5 weeks)

Understand patterns and functional thinking (4-5 weeks)

Essential Questions	Student Learning Objectives/NJSLS	Suggested Tasks/Activities	Evidence of Learning (Assessments)
<p>How does our knowledge of algebra help us as we navigate the world around us?</p>	<p>NJSLS Content Standards</p> <p>MC 4.1:</p> <p>1.OA.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. EE.1.OA.1.a-b. (LLD Math 1)</p> <p>1.OA.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. EE.1.OA.2. (LLD Math 1&2)</p> <p>2.OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using</p>	<ul style="list-style-type: none"> - Manipulatives/ tangible objects around the classroom to demonstrate putting together and taking apart - Utilize manipulatives to group items together to visualize and compare, in order to determine less than, greater than, or equal to - Utilize the number line to reinforce the direction addition and subtraction moves - Create and utilize a graphic organizer of our four basic operations as a reference tool <ul style="list-style-type: none"> - Inclusion of an example for each operation - Translate words into symbols and draw pictures to visualize a word problem 	<ul style="list-style-type: none"> - Projects (S) - Quizzes (F, S) - Classwork (F) <ul style="list-style-type: none"> - Individual - Collaborative - Homework (F) - CBI Trips (F) - Alternate Assessments - DLM Tasks (F, B)

drawings and equations with a symbol for the unknown number to represent the problem. Foundation for EE.3.OA.4. (LLD Math 2)

3.OA.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$. EE.3.OA.4. (LLD Math 2)

4.OA.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. EE.4.OA.3. (LLD Math 3&4)

6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.

6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.

6.EE.3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to

produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.

EE.6.EE.1-3

6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. EE.6.EE.6.

7.EE.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. EE.7.EE.4.

8.EE.7. Solve linear equations in one variable. EE.8.EE.7.

A-CED.1. Create equations and inequalities in one variable, and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. EE.A-CED.1.

A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. EE.A-CED.2.

A-SSE.1. Interpret expressions that represent a quantity in terms of its

context. EE.A-SSE.1.

MC 4.2:

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. EE.3.OA.9. (LLD Math 2)

4.OA.5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way. EE.4.OA.5. (LLD Math 3)

5.OA.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other

sequence. Explain informally why this is so. EE.5.OA.3. (LLD Math 4)

7.EE.2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.” EE.7.EE.2.

8.EE.2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. EE.8.EE.2.

8.F.1. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. EE.8.F.1.

8.F.2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. EE.8.F.2.

8.F.5. Describe qualitatively the

	<p>functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. EE.8.F.5.</p> <p>F-IF.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. EE.F-IF.1.</p> <p>A-REI.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). EE.A-REI.10.</p> <p>NJSLS SMP</p> <p>MP1. Make sense of problems and persevere in solving them MP2. Construct viable arguments and critique the reasoning of others MP3. Reason abstractly and quantitatively MP4. Model with mathematics MP5. Attend to precision MP6. Use appropriate tools strategically MP7. Look for and make use of structure MP8. Look for and express regularity in repeated reasoning</p>		
<p>Materials</p>	<ul style="list-style-type: none"> ● Texts: teacher-created resources (on grade level); Pearson Algebra I Common Core (advanced); IXL (on grade level, and advanced) 		

	<ul style="list-style-type: none"> ● Counters ● Number lines ● Pattern blocks to illustrate the connection between patterns of shapes, and of numbers and sequences.
ary/Additional	<ul style="list-style-type: none"> - Algebraic thinking involves using patterns to understand the world. Students will develop their algebraic reasoning with the goal of better understanding the world around them, with a particular emphasis on scheduling, time, and measurement. Applications will involve several other disciplines, most notably science and social studies. - Teachers will draw on contexts that draw on the experiences of diverse people, and will seek out applications related to climate change, when appropriate.
Life and Careers (S)	<p>- 21st Century Life and Careers</p> <p>9.4.12.CI.1 9.4.12.CI.3 9.4.12.CT.1 9.4.12.CT.2</p> <p>- Technology</p> <p>9.4.12.IML.3</p> <p>- Career Education</p> <p>9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2</p> <ul style="list-style-type: none"> ● To engage students in meaningful mathematical discourse to build shared understanding of mathematics by analyzing and comparing student approaches and arguments. ● To support students in productive struggle in learning mathematics. Students will engage in productive struggle as they grapple with mathematical ideas and relationships.
Standards/DT	<p>8.1.P.A.1 Use an input device to select an item and navigate the screen.</p> <p>8.1.P.A.2 Navigate the basic functions of a browser.</p> <p>8.1.P.A.3 Use digital devices to create stories with pictures, numbers, letters and words.</p> <p>8.1.P.A.4 Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer).</p> <p>8.1.P.A.5 Demonstrate the ability to access and use resources on a computing device.</p> <p>8.1.12.DA.1 8.1.12.DA.5 8.1.12.DA.6</p>

	8.1.12.AP.1 8.2.12.ETW.2
LA Companion Standards	RST.9-10.3 RST.9-10.4 RST.9-10.7 RST.11-12.3 RST.11-12.4

Content-Specific Modifications and Accommodations

Special Education	At-Risk
e print materials tional time for assignments ew of directions tudents restate information rete examples visuals to support instruction al cues and prompts h paper to assist in organizing or lining up math problems uent check-ins	<ul style="list-style-type: none"> ● Incorporate student choice ● Provide peer mentoring to improve understanding of the ma

Additional Modifications and Accommodations

h special needs: Teachers and support staff will attend to all modifications and accommodations listed in students' IEPs and 504s. Teach
 manipulatives, extra time, alternative assessments, scaffolding, spiraling, technology, and flexible grouping to support student learning.

students: Teachers and support staff will work to support multilingual students in their first language and in English, providing materials an
 support students' understanding. Students will be given additional time, as appropriate, and translation tools will be utilized as needed.

risk of school failure:
 d summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services, whic
 nt consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and spiraling.

talented Students: Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions
 d extended problem solving and critical thinking opportunities.

Unit 4: Geometry

Duration: Approximately 10 Weeks

Student Learning Standards (NJSLS)

Demonstrate increasingly complex spatial reasoning and understanding of geometric principles.

Understand and use geometric properties of two- and three-dimensional shapes (4-5 weeks)

Solve problems involving area, perimeter, and volume (4-5 weeks)

Essential Questions	Student Learning Objectives/NJSLS	Suggested Tasks/Activities	Evidence of Learning (Assessments)
<p>How and where do geometric principles appear in the world around us?</p>	<p>NJSLS Content Standards</p> <p>MC 2.1:</p> <p>K.G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. EE.1.G.a. (LLD Math 1)</p> <p>2.G.1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. EE.2.G.1. (LLD Math 2)</p> <p>3.G.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals</p>	<ul style="list-style-type: none"> - Identify shapes in real life, in our outside environment and community, as well as in our immediate classroom - Utilize objects around PHHS (similar to a scavenger hunt) - Utilize pattern blocks to partition shapes into two, three, or four equal shares <ul style="list-style-type: none"> - Describe the shares using the words halves, thirds, half of, a third of, etc. to reinforce fractions, and - Identify what smaller shapes form together to create larger shapes (shapes with a greater number of sides) - Explore the interdisciplinary connection with driver's education, i.e.: <ul style="list-style-type: none"> - Parallel parking - Double lines (parallel lines) that divide streets and highways - Street intersections form perpendicular lines 	<ul style="list-style-type: none"> - Projects (S) - Quizzes (F, S) - Classwork (F) <ul style="list-style-type: none"> - Individual - Collaborative - Homework (F) - CBI Trips (F) - Alternate Assessments - DLM Tasks (F, B)

that do not belong to any of these subcategories. EE.3.G.1. (LLD Math 3)

4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

EE.4.G.1. (LLD Math 4)

5.G.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

EE.5.G.1. (LLD Math 4)

7.G.2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. EE.7.G.2.

7.G.5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write

and solve simple equations for an unknown angle in a figure. EE.7.G.5.

8.G.1. Verify experimentally the properties of rotations, reflections, and translations. EE.8.G.1.

8.G.2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. EE.8.G.2.

8.G.5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. EE.8.G.5.

G.CO.1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. EE.G-CO.1.

G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

EE.G-CO.4.

G-CO.5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. EE.G-CO.5.

G-MG.1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

EE.G-MG.1.

MC 2.2:

K.G.2. Correctly name shapes regardless of their orientations or overall size.

K.G.3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”). EE.K.G.2–3. (LLD Math 1)

2.G.3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

EE.2.G.3. (LLD Math 2)

3.G.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area

of each part as $\frac{1}{4}$ of the area of the shape. EE.3.G.2. (LLD Math 3)

4.G.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. EE.4.G.2. (LLD Math 4)

4.MD.3. Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length by viewing the area formula as a multiplication equation with an unknown factor. EE.4.MD.3.

5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft, and improvised units. EE.5.MD.4.

5.MD.5. Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume. EE.5.MD.5.

6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. EE.6.G.1. (LLD Math 4)

6.G.2. Find the volume of a right

rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. EE.6.G.2.

7.G.6. Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. EE.7.G.6.

8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres, and use them to solve real-world and mathematical problems. EE.8.G.9.

G-GMD.3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. EE.G-GMD.3.

G-GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula. EE.G-GPE.7.

NJSLS SMP

MP1. Make sense of problems and persevere in solving them

MP2. Construct viable arguments and critique the reasoning of others

	MP3. Reason abstractly and quantitatively MP4. Model with mathematics MP5. Attend to precision MP6. Use appropriate tools strategically MP7. Look for and make use of structure MP8. Look for and express regularity in repeated reasoning		
Materials	<ul style="list-style-type: none"> ● Texts: teacher-created resources (on grade level); Pearson Geometry Common Core (advanced); IXL (remediation, on grade level, and advanced) ● Geometric color solids ● Geoboards ● Pattern blocks ● Fraction tiles 		
Primary/Additional	<ul style="list-style-type: none"> - An understanding of the attributes and relationships of geometric objects can be applied in diverse contexts: interpreting a schematic drawing, estimating the amount of wood needed to frame a sloping roof, rendering computer graphics, or designing a sewing pattern for the most efficient use of material. - Driver's education, i.e. parallel parking, the double lines (parallel lines) that divide streets and highways at street intersections that form perpendicular lines - Teachers will draw on contexts that draw on the experiences of diverse people, and will seek out appropriate contexts for climate change, when appropriate. 		
Life and Careers (S)	<p>- 21st Century Life and Careers</p> <p>9.4.12.CI.1 9.4.12.CI.3 9.4.12.CT.1 9.4.12.CT.2</p> <p>- Technology</p> <p>9.4.12.IML.3</p> <p>- Career Education</p> <p>9.2.12.CAP.2 9.3.ST.5 9.3.ST-ET.5 9.3.ST-SM.2</p> <ul style="list-style-type: none"> ● To engage students in meaningful mathematical discourse to build shared understanding of mathematics by analyzing and comparing student approaches and arguments. ● To support students in productive struggle in learning mathematics. Students will engage in productive struggle as they grapple with mathematical ideas and relationships. 		

Standards/ DT	8.1.P.A.1 Use an input device to select an item and navigate the screen. 8.1.P.A.2 Navigate the basic functions of a browser. 8.1.P.A.3 Use digital devices to create stories with pictures, numbers, letters and words. 8.1.P.A.4 Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer). 8.1.P.A.5 Demonstrate the ability to access and use resources on a computing device. 8.1.12.DA.1 8.1.12.DA.5 8.1.12.DA.6 8.1.12.AP.1 8.2.12.ETW.2
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Content-specific Modifications and Accommodations

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Additional Modifications and Accommodations

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Gifted students: Teachers and support staff will work to support multilingual students in their first language and in English, providing materials and strategies to support students' understanding. Students will be given additional time, as appropriate, and translation tools will be utilized as needed.

At risk of school failure: Student summative data will be used to monitor student success, and students at risk of failure will receive additional supports and services, which may include extra consultation, extra help, and differentiation strategies, including small group instruction, group work, scaffolding, and spiraling.

Talented Students: Students who excel in their mastery of course standards will be further challenged with more complex tasks, extensions, and extended problem solving and critical thinking opportunities.