

Rumson-Fair Haven Regional High School Curriculum

Course: *Learning & Language Disabilities 9 - Mathematics (LLD Math 9)*

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Section I: Course Description

The *Learning & Language Disabilities 9 - Mathematics (LLD Math 9)* curriculum is designed with the belief that all students need to gain a strong foundation in mathematical literacy to aid in career success and 21st-century life. The design of the curriculum will ensure that all students are mathematically challenged, based on appropriate ability and pace, while developing critical thinking and problem-solving strategies. The course is driven by the New Jersey Student Learning Standards for Mathematics and Mathematical Practice Standards with an emphasis on exposure to key knowledge, transferable skills, and practical real-world application. Students in this course will deepen foundational concepts from grades 6 - 8, exploring functions both graphically and numerically. The course allows for teachers to differentiate to better meet the needs of all students through small group targeted instruction.

Section II: NJSLs: New Jersey Student Learning Standards/Learning Objectives

1. **2023 New Jersey Student Learning Standards – Mathematics:**
 - “A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society; ...A high-quality mathematics education fosters a population that...leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions, persists to make sense of and model problems arising in everyday life, society, and the workplace, thinks critically and strategically to assess quantitative relationships and to solutions to complex problems, employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers’ reasoning, interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well as the claims made in the private and public sectors, communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.”
2. **2023 New Jersey Student Learning Standards English Language Arts:**
 - A New Jersey education in English Language Arts builds readers, writers, and communicators prepared to meet the demands of college and career and to engage as productive American citizens with global responsibilities. ...Students will develop the necessary skills in reading, writing, speaking, and listening that are the foundations for creative and purposeful expression in language read rich, challenging texts that build their knowledge of the world, grow their confidence and identities as readers, and develop critical thinking skills and vocabulary necessary for long-term success[; e]ngage in regular, meaningful, writing authentic tasks, exploring valued topics, writing for impact and expression, and sharing their work with others (including authentic audiences) leverage complex texts and digital media to develop comprehension, active listening, and discussion skills ground daily writing and discussion in evidence, fostering an ability to read critically, build arguments, cite evidence, and communicate ideas to contribute meaningfully as productive citizens evaluate the reliability, credibility, and perspective of authors and speakers across all forms of media express ideas and knowledge through a variety of modalities and media, and serve as effective communicators who purposefully read, write, and speak across multiple disciplines [and l]earn to persist in reading complex texts, establishing lifelong habits to read voluntarily for pleasure, for further education, for information on public policy, and for advancement in the workplace.
3. **Standard 8.1 (Computer Science) and 8.2 (Design Thinking) of the 2020 NJSLs:**
 - “The ‘Intent and Spirit of the Computer Science and Design Thinking Standards’ is to focus on deep understanding of concepts that enable students to think critically and systematically about leveraging technology to solve local and global issues. Authentic learning experiences that enable students to apply content knowledge, integrate concepts across disciplines, develop computational thinking skills, acquire and incorporate varied perspectives, and communicate with diverse audiences about the use and effects of computing prepares New Jersey students for college and careers.”
4. **Standard 9.4 (Life Literacies and Key Skills) of the 2020 NJSLs:**
 - “This standard outlines key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.”
 - **Climate Change:** The state of New Jersey has mandated instruction in, “Climate Change across all content areas, leveraging the passion students have shown for this critical issue and providing them

opportunities to develop a deep understanding of the science behind the changes and to explore the solutions our world desperately needs.”

5. **[Dynamic Learning Maps Essential Elements](#)**
 - The Dynamic Learning Maps Essential Elements are specific statements of knowledge and skills linked to the grade-level expectations identified in the Common Core State Standards. The purpose of the Dynamic Learning Maps Essential Elements is to build a bridge from the content in the Common Core State Standards to academic expectations for students with the most significant cognitive disabilities.
6. **[*Amistad Law: N.J.S.A. 18A 52:16A-88:](#)**
 - The inclusion of lessons and resources/texts dealing with the African slave trade, slavery in America, the vestiges of slavery in this country, and the contributions of African Americans to our society will be implemented in English and Social Studies courses in accordance with state law: “Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.”
7. **[*Holocaust Law: N.J.S.A. 18A 35-28:](#)**
 - The inclusion of lessons and resources/texts that enable pupils to identify and analyze applicable theories concerning human nature and behavior; to understand that genocide is a consequence of prejudice and discrimination; and to understand that issues of moral dilemma and conscience have a profound impact on life will be implemented in English and Social Studies courses in accordance with state law: “Every board of education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.”
8. **[*LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35:](#)**
 - A transformative approach to the inclusion of lessons and resources/texts on the contributions and issues concerning the LGBTQ+ population and people with disabilities will be implemented across all core subjects in accordance with state law: “A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district’s implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36). A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.”
9. **[*Asian American and Pacific Islanders Legislation: N.J.S.A 4021/A6100:](#)**
 - The inclusion of lessons and resources/texts on the history and contributions of Asian Americans and Pacific Islanders will enable New Jersey’s schools to provide a curriculum that reflects the diversity of our state. In accordance with state law: “A board of education shall include instruction on the history and contributions of Asian Americans and Pacific Islanders in an appropriate place in the curriculum of students in grades kindergarten through as part of the school district’s implementation of the New Jersey Student Learning Standards in Social Studies.”
10. Acquisition/development/refinement of the higher-order critical thinking skills aligned with the *Revised Bloom’s Taxonomy of Cognitive Objectives*

Section III: Curriculum Modifications

The *LLD Math 9* curriculum is subject to case-by-case modifications to support/advance the needs of all students, including special education students, English language learners, gifted students, and those at risk of school failure. These modifications are based on Individualized Learning Programs (IEPs), recommendations made by the district’s English Language Learners (ELL) coordinator, feedback from members of the Intervention & Referral Services Team (*I&RS*) for at-risk students, and 504 Plans.

Coursework and assessments will be modified on an individual basis for students when necessary. Modifications may include but are not limited to those outlined on the [Modifications/Accommodations for Mathematics Courses](#) chart.

Section IV: Preparation for Standardized Testing

Instruction in *LLD Math 9* is aligned with the requirements of state and national standardized assessments, including the *NJGPA*, *NJSLSA*, the *ACT*, the *PSAT*, and the *SAT*.

Section V: Curriculum Pacing Guide

| Curriculum Pacing Guide | |
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| Course Title: <i>LLD Math 9</i> | Grade Level: 9-12 |
| Unit I: Number Sense | Weeks 1-3 |
| Unit II: Ratios & Proportions | Weeks 4-7 |
| Unit III: Numbers & Quantities - The Real Number System | Weeks 8-11 |
| Unit IV: Seeing Structure in Expressions | Weeks 12-15 |
| Unit V: Creating & Solving Linear Equations | Weeks 16-20 |
| Unit VI: Linear Inequalities | Weeks 21-25 |
| Unit VII: Modeling Linear Functions | Weeks 26-29 |
| Unit VIII: Interpreting Linear Functions | Weeks 30-34 |
| Unit IX: Non-Linear Functions | Weeks 35-37 |
| Unit X: Statistics | Weeks 38-40 |

Section VI: Primary Texts and Year-Long Instructional Resources

The following texts and instructional resources are employed in *LLD Math 9*:

- Holt McDougal, et al, *Algebra I*, Houghton Mifflin Harcourt, 2012. (textbook and workbooks).
- TI-30 Scientific/TI-83 Graphing Calculators
- Kuta Software
- Technology resources include:
 - Google Suite, including Google Classroom
 - Math XL

- Kami
- Desmos Graphing Calculator and Activity Builder
- Edulastic
- Common Sense Education (www.commonsense.org)

Section VII: Grading Formula and Assessment Modes

Marking period grades in *LLD Math 9* are determined via a percentage weighting model. The specific grading categories and weightings of each will be determined prior to the start of each academic year and will be published in the posted/distributed course syllabi.

Assessments in *LLD Math 9* vary greatly in format, scope/content/skills assessed, and alternative assessments; differentiation in assessments and choice will be incorporated as appropriate. Preliminary assessments of each format will be used as benchmarks, and summative assessments will be created/revised collaboratively each year and planned by members of the *LLD Math 9* instructional team to inform future learning and to measure student growth.

Section VIII: Unit Templates

The following unit templates have been established for the *Language & Learning Disabilities 9 - Mathematics* curriculum by the *LLD Math* instructional team:

| Unit I: Number Sense | | |
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| Unit Summary | | |
| Students will build on the foundation knowledge acquired in grades 6 - 8, recalling number sense skills. Review topics will include whole number computation, estimation, decimals and place value, fractions, numeric structure, and the number line. | | |
| Standards/Core Ideas/Performance Expectations | | |
| <p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>LLD Math 9</i>:</p> <ul style="list-style-type: none"> ● <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> ○ MP.1-8 ○ 6.NS, 7.NS, 8.NS ○ N.RN.A.1-3 ● <i>2023 New Jersey Student Learning Standards English Language Arts</i> <ul style="list-style-type: none"> ○ RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4 ● <i>Dynamic Learning Maps Essential Elements for Mathematics</i> <ul style="list-style-type: none"> ○ M.EE.N.RN.1 ● <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> ○ 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 ● <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> ○ 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | | |
| Unit Essential Questions | Unit Enduring Understandings | |
| <ul style="list-style-type: none"> ● Why is number sense a foundational skill in mathematics? ● What are the four basic operations to solve problems? ● How do students compare numbers in different structures? ● What are the benefits of knowing how fractions and decimals are related? | <ul style="list-style-type: none"> ● Number sense is a foundational skill in mathematics because it provides a deep understanding of numbers, their relationships, and how they operate. ● The four basic operations—addition, subtraction, multiplication, and division—are the building blocks of arithmetic and algebra. ● Comparing numbers in different structures involves understanding their relative values and magnitudes, this includes place values, number lines, estimation, and fractions and decimals. ● Knowing how fractions and decimals are related allows for flexibility in problem-solving, enhanced number sense, and improved estimation skills. | |
| Evidence of Learning | | |
| <p>Formative & Alternative Assessments:</p> <ul style="list-style-type: none"> ● Classwork ● Homework ● Performance activities | <p>Benchmark & Summative Assessments:</p> <ul style="list-style-type: none"> ● Benchmark Quizzes ● Benchmark Tests | <p>Resources Needed:</p> <ul style="list-style-type: none"> ● Chromebook ● Scientific Calculator ● Math XL/Kuta Software ● Multiplication Chart |

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| <ul style="list-style-type: none"> Individual student check-ins with teacher | | <ul style="list-style-type: none"> Number Line |
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Unit II: Ratios & Proportions

Unit Summary

Students will use reasoning about multiplication and division to solve ratio and rate problems. Students will discuss equivalent ratios and rates through analysis of drawings and manipulatives. Students will build on this foundational understanding to develop the process of solving proportions, applying this concept to real-world applications. By the end of the unit, students will be able to distinguish between proportional relations and other relationships.

Standards/Core Ideas/Performance Expectations

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *LLD Math 9*:

- *2023 New Jersey Student Learning Standards: Mathematics*
 - MP.1-8
 - 6.RP, 7.RP
 - N.Q.A.1-3
- *2023 New Jersey Student Learning Standards English Language Arts*
 - RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4
- *Dynamic Learning Maps Essential Elements for Mathematics*
 - M.EE.N.Q.1–3.
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
 - 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
 - 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5

| Unit Essential Questions | Unit Enduring Understandings |
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- How does one recognize and represent proportional relationships between quantities?
- How do students apply proportions?

- A proportional relationship exists between two quantities when their ratio remains constant. This means that as one quantity increases or decreases, the other quantity changes by the same factor.
- Students may apply proportions through scaling, unit rates, similar figures, and percent problems to solve real-world problems

Evidence of Learning

Formative & Alternative Assessments:

- Classwork
- Homework
- Performance activities
- Individual student check-ins with teacher

Benchmark & Summative Assessments:

- Quizzes
- Tests

Resources Needed:

- Chromebook
- Scientific Calculator
- Math XL/Kuta Software

Unit III: Numbers & Quantity - The Real Number System

Unit Summary

Students will extend their foundation from unit I to perform arithmetic operations with real numbers, where integers can be used to represent real-world quantities. Students will explore the subsets of the real numbers, reason quantitatively, and use units to solve real-world problems.

Standards/Core Ideas/Performance Expectations

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *LLD Math 9*:

- *2023 New Jersey Student Learning Standards: Mathematics*
 - MP.1-8
 - N.RN.A.1-3, N.NC.A.2, N.Q.A.1-3
- *2023 New Jersey Student Learning Standards English Language Arts*
 - RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4
- *Dynamic Learning Maps Essential Elements for Mathematics*
 - M.EE.N.RN.1
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*

| <ul style="list-style-type: none"> ○ 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 ● 2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills <ul style="list-style-type: none"> ○ 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | | |
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| Unit Essential Questions | Unit Enduring Understandings | |
| <ul style="list-style-type: none"> ● What makes up the set of real numbers? ● What are the properties of real numbers? ● How can real numbers be used in the real world? | <ul style="list-style-type: none"> ● Real numbers are natural, whole, integer, rational, and irrational numbers ● The properties are: commutative, associative, distributive, identity, and inverse. ● The properties of real numbers are relationships that are true for all real numbers, except in one case, zero. ● In the real world, students can perform arithmetic operations with real numbers. Integers can be used to represent real-world quantities, and students can reason quantitatively, using appropriate units to solve problems. | |
| Evidence of Learning | | |
| Formative & Alternative Assessments: | Benchmark & Summative Assessments: | Resources Needed: |
| <ul style="list-style-type: none"> ● Classwork ● Homework ● Performance activities ● Individual student check-ins with teacher | <ul style="list-style-type: none"> ● Quizzes ● Tests | <ul style="list-style-type: none"> ● Chromebook ● Scientific Calculator ● Math XL/Kuta Software ● Multiplication Chart ● Number Line |

| Unit IV: Seeing Structure in Expressions | | |
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| Unit Summary | | |
| Students will be introduced to concepts of algebraic thinking while reviewing skills acquired in previous units. | | |
| Standards/Core Ideas/Performance Expectations | | |
| The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>LLD Math 9</i> : | | |
| <ul style="list-style-type: none"> ● 2023 New Jersey Student Learning Standards: Mathematics <ul style="list-style-type: none"> ○ MP.1-8 ○ A.SSE.A.1, N.RN.A.2-3 ● 2023 New Jersey Student Learning Standards English Language Arts <ul style="list-style-type: none"> ○ RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4 ● Dynamic Learning Maps Essential Elements for Mathematics <ul style="list-style-type: none"> ○ M.EE.A.SSE.1. ● 2020 New Jersey Student Learning Standards: Computer Science and Design Thinking <ul style="list-style-type: none"> ○ 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 ● 2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills <ul style="list-style-type: none"> ○ 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | | |
| Unit Essential Questions | Unit Enduring Understandings | |
| <ul style="list-style-type: none"> ● How can students use the properties of real numbers to simplify algebraic expressions? ● Why and how can like terms be combined? ● How can expressions be interpreted? ● How can equivalent expressions using mathematical properties be created? ● Why are exponent properties important in mathematics? ● How do radicals and squares help solve problems? | <ul style="list-style-type: none"> ● The properties of real numbers provide a framework for simplifying algebraic expressions through the commutative, associative, distributive, identity, and inverse properties. ● Like terms are terms that have the same variable raised to the same power. Like terms can be combined because they represent the same quantity. ● Expressions can be interpreted as mathematical phrases that represent a value or relationship. To interpret an expression, the variables, coefficients, and operations involved must be considered. ● Equivalent expressions can be created by applying the properties of real numbers. For example, to create an equivalent expression for $3(x + 2)$, we can distribute the 3 to get $3x + 6$. ● Exponent properties are essential for working with powers and roots. They allow students to simplify expressions, solve equations, and understand exponential growth and decay. | |

| <ul style="list-style-type: none"> Radicals and squares are inverse operations. A radical ($\sqrt{\quad}$) is used to find the root of a number, while a square (2) is used to find the square of a number. These operations are essential for solving equations, simplifying expressions, and working with geometric problems. | | |
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| Evidence of Learning | | |
| Formative & Alternative Assessments: <ul style="list-style-type: none"> Classwork Homework Performance activities Individual student check-ins with teacher | Benchmark & Summative Assessments: <ul style="list-style-type: none"> Quizzes Tests | Resources Needed: <ul style="list-style-type: none"> Chromebook Scientific Calculator Math XL/Kuta Software Multiplication Chart Number Line Graphic Organizer |

| Unit V: Creating and Solving Linear Equations | |
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| Unit Summary | |
| <p>Students will build on their knowledge of the structure of expressions to construct equations. Students will recognize that equations can be used to describe numbers and relationships. Students will use the properties of equality and inverse operations, as established in earlier units, to solve equations in one variable.</p> | |
| Standards/Core Ideas/Performance Expectations | |
| <p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>LLD Math 9</i>:</p> <ul style="list-style-type: none"> <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> MP.1-8 A.SSE.B.3, N.Q.A.1, A.CED.A.1 & 4, A.REI.A.1 & B.3 <i>2023 New Jersey Student Learning Standards English Language Arts</i> <ul style="list-style-type: none"> RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4 <i>Dynamic Learning Maps Essential Elements for Mathematics</i> <ul style="list-style-type: none"> M.EE.A.SSE.3, M.EE.A.REI.10–12 <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | |
| Unit Essential Questions | Unit Enduring Understandings |
| <ul style="list-style-type: none"> How are unknown quantities represented? How can the value of an unknown variable be found? What is equivalence? | <ul style="list-style-type: none"> Unknown quantities are often represented using variables. These are typically letters like x, y, or z. To find the value of an unknown variable, use equations. An equation is a mathematical statement that says two expressions are equal. Equivalence means that two expressions are equal. In mathematics, the equal sign ($=$) is used to denote equivalence. For example, $2 + 3$ is equivalent to 5. Equivalence is a fundamental concept in Algebra and is used to manipulate equations and solve for unknown variables. |

| Evidence of Learning | | |
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| Formative & Alternative Assessments: <ul style="list-style-type: none"> Classwork Homework Performance activities Individual student check-ins with teacher | Benchmark & Summative Assessments: <ul style="list-style-type: none"> Quizzes Tests | Resources Needed: <ul style="list-style-type: none"> Chromebook Scientific Calculator Math XL/Kuta Software Graphic Organizer |

| Unit VI: Linear Inequalities |
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| Unit Summary |
| <p>Students will extend their knowledge of equations to represent quantities using inequalities. Students will create inequalities that describe numbers and relationships. Students will recognize that the properties of solving equations will be applied to inequalities, where they can represent the solution set on a number line.</p> |

| Standards/Core Ideas/Performance Expectations | |
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| <p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>LLD Math 9</i>:</p> <ul style="list-style-type: none"> ● <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> ○ MP.1-8 ○ A.CED.A.2-4, A.REI.B.3 ● <i>2023 New Jersey Student Learning Standards English Language Arts</i> <ul style="list-style-type: none"> ○ RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4 ● <i>Dynamic Learning Maps Essential Elements for Mathematics</i> <ul style="list-style-type: none"> ○ M.EE.A.CED.2–4 ● <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> ○ 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 ● <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> ○ 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | |

| Unit Essential Questions | Unit Enduring Understandings |
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| <ul style="list-style-type: none"> ● How do the tools of algebra relate to equations and inequalities? ● Why is it preferable to solve inequalities rather than using an equation? ● How is a solution set represented on a number line? | <ul style="list-style-type: none"> ● Algebraic tools, such as variables, expressions, and equations, are fundamental to understanding and solving equations and inequalities. All Algebra tools used to solve equations can be used to evaluate inequalities. ● While equations give specific solutions, inequalities provide a range of solutions. This is useful in real-world situations where there might be constraints or limitations. ● A number line is a visual representation of real numbers. To represent a solution set on a number line: identify the endpoints, determine the direction, mark the endpoints, and shade the solution region. |

| Evidence of Learning | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Formative & Alternative Assessments: <ul style="list-style-type: none"> ● Classwork ● Homework ● Performance activities ● Individual student check-ins with teacher | Benchmark & Summative Assessments: <ul style="list-style-type: none"> ● Quizzes ● Tests | Resources Needed: <ul style="list-style-type: none"> ● Chromebook ● Scientific Calculator ● Math XL/Kuta Software ● Graphic Organizer ● Number Line |

| Unit VII: Modeling Linear Functions | |
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| Unit Summary | |
| <p>Students will be introduced to the visual representation of an equation in two variables. The unit covers how to graph linear functions and the different forms a linear function can take. The relationships between vertical and horizontal lines will be covered.</p> | |
| Standards/Core Ideas/Performance Expectations | |
| <p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>LLD Math 9</i>:</p> <ul style="list-style-type: none"> ● <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> ○ MP.1-8 ○ A.CED.A.2, A.REI.D.10, F.BF.A.1, F.LE.A.1 & 3, F.IF.C.7, S.ID.C.7 ● <i>2023 New Jersey Student Learning Standards English Language Arts</i> <ul style="list-style-type: none"> ○ RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4 ● <i>Dynamic Learning Maps Essential Elements for Mathematics</i> <ul style="list-style-type: none"> ○ M.EE.F.IF.1–3 & 4-6 ● <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> ○ 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 ● <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> ○ 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | |
| Unit Essential Questions | Unit Enduring Understandings |
| <ul style="list-style-type: none"> ● What information does the equation of a line provide? | <ul style="list-style-type: none"> ● The equation of a line, typically in the form $y = mx + b$, provides the slope and the y-intercept of the line. |

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| <ul style="list-style-type: none"> • How are equations and graphs related? • What is meant by the slope of a line, and how can knowing a line's slope help to graph a line? • What are the changes in the graph of a linear function when numerical values in the function are altered? • What are the different methods of graphing linear equations? | <ul style="list-style-type: none"> • Equations and graphs are related by plotting points that satisfy the equation to visualize the graph or to analyze the graph's information to determine the equation. • The slope of a line measures its steepness and direction. It's calculated as the ratio of the vertical change (rise) to the horizontal change (run) between any two points on the line. This allows you to plot points to graph the line. • Altering numerical values in a linear function can affect the graph by changing the slope or changing the y-intercept. • The different methods of graphing linear equations are: Plotting points, using the slope-intercept form, using the intercept method (point/slope form). |
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Evidence of Learning

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Formative & Alternative Assessments: <ul style="list-style-type: none"> • Classwork • Homework • Performance activities • Individual student check-ins with teacher | Benchmark & Summative Assessments: <ul style="list-style-type: none"> • Quizzes • Tests | Resources Needed: <ul style="list-style-type: none"> • Chromebook • TI-83 Graphing Calculator • Math XL/Kuta Software • Desmos Graphing Calculator • Graphic Organizer • Coordinate Plane |
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Unit VIII: Interpreting Linear Functions

Unit Summary

Students will extend their knowledge from Unit VII on Linear Functions to analyze scatter plots and determine the prediction equation for the line of best fit.

Standards/Core Ideas/Performance Expectations

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *LLD Math 9*:

- *2023 New Jersey Student Learning Standards: Mathematics*
 - MP.1-8
 - A.CED.A.2, A.REID.10-12, F.BF.A.1, F.LE.A.1 & 3, F.IF.A.1-3 & B.4-6, S.ID.C.7
- *2023 New Jersey Student Learning Standards English Language Arts*
 - RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4
- *Dynamic Learning Maps Essential Elements for Mathematics*
 - M.EE.F.IF.1–3 & 4-6
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
 - 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
 - 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5

Unit Essential Questions

- What makes a set of data a function?
- How are functions used to model data?
- What can functions reveal about a set of data?

Unit Enduring Understandings

- A set of data represents a function if each input value (x-value) corresponds to exactly one output value (y-value). In simpler terms, for every x, there can only be one y. This is often visualized as the vertical line test: if a vertical line intersects the graph of the data at more than one point, it's not a function.
- Functions are used to model data by allowing students to identify trends, make predictions, and optimize decisions.
- Functions can reveal the following about data: rate of change, extrema, trends and patterns, and relationships between variables.

Evidence of Learning

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| Formative & Alternative Assessments: <ul style="list-style-type: none"> • Classwork • Homework • Performance activities • Individual student check-ins with | Benchmark & Summative Assessments: <ul style="list-style-type: none"> • Quizzes • Tests | Resources Needed: <ul style="list-style-type: none"> • Chromebook • TI-83 Graphing Calculator • Math XL/Kuta Software • Desmos Graphing Calculator • Coordinate Plane |
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|---------|--|-----------------|
| teacher | | • Straight Edge |
|---------|--|-----------------|

Unit IX: Nonlinear Functions

Unit Summary

Students will extend their knowledge of functions to identify when a function is linear or nonlinear. Students will recognize the characteristics of functions that classify a function as linear. The unit will develop an understanding of functions and what characteristics are necessary to create non-linear functions. Technology will play a primary role in visualizing and comparing functions in this unit.

Standards/Core Ideas/Performance Expectations

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *LLD Math 9*:

- *2023 New Jersey Student Learning Standards: Mathematics*
 - MP.1-8
 - F.BF.A.1 & B.3, F.LE.A.1, 3 & B.5, F.IF.B.4-6 & C.7-9
- *2023 New Jersey Student Learning Standards English Language Arts*
 - RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4
- *Dynamic Learning Maps Essential Elements for Mathematics*
 - M.EE.F.LE.1–3
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
 - 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
 - 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5

| Unit Essential Questions | Unit Enduring Understandings |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • What are the similarities/differences between linear and nonlinear functions? • How can the visual representation of a nonlinear function be identified? • How can it be determined if a function is linear or nonlinear without its graph? | <ul style="list-style-type: none"> • Both linear and nonlinear functions represent relationships between input and output values, and both can model real-world phenomena. • The differences include that linear functions have a constant rate of change, graphed as a straight line and can be represented in slope-intercept form, while nonlinear functions have a variable rate of change and graph as a curve. • A nonlinear function's graph is not a straight line. It can be a curve, a parabola, an exponential curve, or other shapes. • Without a graph, students can use a calculated constant rate of change or a written form as $y=mx+b$ to confirm a graph is linear; if it does not fit those characteristics, it is a nonlinear function. |

Evidence of Learning

| Formative & Alternative Assessments: | Benchmark & Summative Assessments: | Resources Needed: |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Classwork • Homework • Performance activities • Individual student check-ins with teacher | <ul style="list-style-type: none"> • Quizzes • Tests | <ul style="list-style-type: none"> • Chromebook • TI-83 Graphing Calculator • Math XL/Kuta Software • Desmos Graphing Calculator • Coordinate Plane |

Unit X: Data & Statistical Analysis

Unit Summary

Students will be introduced to concepts and misconceptions of statistics. This unit reviews central tendencies and presents ways to organize and display data while identifying when these representations can be misleading.

Standards/Core Ideas/Performance Expectations

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *LLD Math 9*:

- *2023 New Jersey Student Learning Standards: Mathematics*
 - MP.1-8
 - S.ID.A.1-3 & B.5
- *2023 New Jersey Student Learning Standards English Language Arts*
 - RL.CR.9–10.1, RI.MF.9–10.6, W.AW.9–10.1.A,B & E, SL.PE.9–10.1, SL.II.9–10.2, SL.PI.9–10.4
- *Dynamic Learning Maps Essential Elements for Mathematics*

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| <ul style="list-style-type: none"> ○ M.EE.S.ID.1–4 ● 2020 New Jersey Student Learning Standards: Computer Science and Design Thinking <ul style="list-style-type: none"> ○ 8.1.12.CS.2-3, 8.1.12.DA.2 & 4, 8.1.12.ED.3, 8.1.12.ETW.3, 8.1.12.EC.3, 8.1.12.IC.1, 8.1.12.NI.3, 8.2.12.NT.1 ● 2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills <ul style="list-style-type: none"> ○ 9.2.12.CAP.2 & 5, 9.4.12.IML.2, 9.4.12.DC.5 | | |
| Unit Essential Questions | Unit Enduring Understandings | |
| <ul style="list-style-type: none"> ● What is the average of a set of data? ● What types of graphs can be used to represent data in real-life? ● In what ways can graphs be misleading and how may this affect real-life situations? | <ul style="list-style-type: none"> ● The average is defined as the center of a set of data and can be found with mean, median and mode. ● To represent data, we may use the following types of graphs: bar graphs, line graphs, pie charts, histograms and scatter plots. ● Graphs can be misleading if they are not constructed carefully by using truncated axes, unequal scaling, cherry-picked data or other deceptive means. ● Misleading graphs can lead to misinformed decision-making, public misperception and ethical concerns. | |
| Evidence of Learning | | |
| Formative & Alternative Assessments: <ul style="list-style-type: none"> ● Classwork ● Homework ● Performance activities ● Individual student check-ins with teacher | Benchmark & Summative Assessments: <ul style="list-style-type: none"> ● Quizzes ● Tests | Resources Needed: <ul style="list-style-type: none"> ● Chromebook ● TI-83 Graphing Calculator ● Math XL/Kuta Software ● Desmos Graphing Calculator ● Straight Edge |

Section IX: Unit Reflection

The *LLD Math 9* instructional team must confer upon the completion of each instructional unit in the *LLD Math 9* curriculum and rate the degrees to which the instructional units meet performance criteria established by the New Jersey Department of Education using the Unit Reflection Form. Completed unit reflection forms must be submitted to the Department Supervisor for approval upon completion of curriculum implementation with a complementing list of suggested modifications to the *LLD Math 9* curriculum.

| Unit Reflection Form: LLD Math 9 | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|---------------|
| Lesson Activities: | Strongly | Moderately | Weakly |
| Foster student use of technology as a tool to develop critical thinking, creativity, and innovation skills; | | | |
| Are challenging and require higher-order thinking and problem-solving skills; | | | |
| Allow for student choice; | | | |
| Provide scaffolding for acquiring targeted knowledge/skills; | | | |
| Integrate modern, global perspectives, especially those regarding diversity, genocide, global issues, and historical ones regarding racial relations; | | | |
| Integrate 21 st century skills; | | | |
| Provide opportunities for interdisciplinary connection and transfer of knowledge and skills; | | | |
| Are varied to address different student learning styles and preferences; | | | |
| Are differentiated based on student needs; | | | |
| Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process; | | | |

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|-----------------------------------------------------------------------------------------------------------------------|--|--|--|
| Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives; | | | |
| Provide opportunities for student reflection and self-assessment; | | | |
| Provide data to inform and adjust instruction to better meet the varying needs of learners. | | | |

Appendix
Writing Instruction and the RFH Community

Writing instruction should happen across the RFH Community. Writing across the curriculum is a philosophy that advances the belief that writing is a method of learning. Since all departments are committed to helping students learn, writing must be used as a methodology to advance student learning.

Each academic discipline has its own unique conventions, formats and structures. It is the responsibility of each department to agree upon domain-specific writing praxes, model them for students, and require them to utilize them on a consistent basis. Students must understand that acceptable writing in one domain may not be acceptable writing in another area. The development of domain-specific writing skills supports the overall development of the student writer because all writing is grounded in the writing situation: audience, context, purpose, subject, and writer. Representatives from the academic disciplines must share their domain-specific writing praxes with each other, identify intersections, and determine how to address perceived gaps that limit student learning.

Students must experience writing situations that help them learn how to think creatively and critically and communicate effectively in the academic disciplines. Writing instruction, regardless of the academic discipline, must always reinforce student understanding of the writing situation. When students experience writing situations, they must study examples of domain-specific writing in order to understand how writers communicate in discipline-related contexts. This does not mean information embedded in textbooks. Domain-specific writing is writing that is used to inform and influence readers as it draws them into an established circle of discourse. Students must use these non-fiction texts to develop the close reading skills that will shape their own writing. Focused engagement with domain-specific writing should not be limited to basic reading comprehension and topical understanding. It must also include the analysis of the writing situation that is represented in the text: audience, context, purpose, subject, and writer. The close reading of well-written texts—regardless of the domain—will show students the importance of writing mechanics, diction, and syntax. The development of close reading skills will also help the students grow in terms of their ability to construct and advance independent and original claims that are well-supported by evidence. Domain-specific writing is grounded in positioning of claims and the effective use of evidence.

The final written product is important; nevertheless, the learning that results in this production must not be devalued. The writing process is not limited to the basic steps of planning, drafting, revising, and editing/proofreading. It is a complex sequence of critical and creative thinking and writing that leads to the production of a text that provides evidence of learning and understanding. Students must ultimately develop the ability to self-assess the effectiveness of their writing as a representation of the writing situation. Without the use of models that evidence learning and understanding, students will not develop the ability to self-assess their own work—the true outcome of the writing process.

What types of writing situations should RFH students engage in?

RFH students should engage in writing situations across the curriculum that require them to:

- write to improve mechanical proficiency, diction usage, and syntactical sophistication
- write to narrate, describe, and reflect
- write to summarize and report
- write to classify and define
- write to explain how process leads to an outcome
- write to compare, contrast and evaluate
- write to speculate on cause and effect
- write to propose solutions and solve problems
- write to analyze

These writing situations should be positioned in a coordinated, developmental sequence that extends across the academic disciplines.

Upon Completion of Grade 12, RFH students must be ready to transition to the following writing situations:

- write to analyze
- write to persuade (argument)

The core focus of first-year college writing courses are analysis and argument. These courses orient the students to the demands and expectations of writing for the academic culture of college. At colleges/universities with carefully coordinated writing programs, students must demonstrate proficiency in analysis and argument before they transition to upper level courses that require them to engage in the following writing situation:

- write to investigate (research)