Rumson-Fair Haven Regional High School Curriculum

Course: *Algebra II Honors*
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Section I: Course Description

Algebra II Honors covers all of the same material as the *Algebra II* course but does so in more depth and at a faster pace to allow time for more complex examples and applications. In addition, *Algebra II Honors* covers two more units: rational functions (operations, writing, and graphing) and conic sections (graphing, writing, solving systems, and applications). Students will revisit linear, radical, and quadratic functions that were first explored in *Algebra I*, but will now take their understanding to a deeper level. Students will then explore conic sections as well as exponential, logarithmic, polynomial, and rational functions. To deepen their understanding, students will make introductory use of graphing calculators throughout the course. Emphasis will be on problem-solving, critical thinking, and applying mathematics to real-world problems. In addition, problem-solving strategies for both NJSLA and the SAT/ACT are incorporated throughout the year for review and preparation

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. ***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."
6. ***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."
7. ***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."
8. ***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."
9. 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 *Algebra II Honors* 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 *Algebra II Honors* is aligned with the requirements of state and national standardized assessments, including the *NJGPA*, *NJSLA*, the *ACT*, the *PSAT,* and the *SAT*.

Section V: Curriculum Pacing Guide

Curriculum Pacing Guide

Course Title: *Algebra II Honors*	**Grade Level:** 9-10
Unit I: Functions	Weeks 1-7
Unit II: Transformations of Functions	Weeks 8-13
Unit III: Quadratic Functions	Weeks 14-18
Unit IV: Polynomial Functions	Weeks 19-27
Unit V: Exponential and Logarithmic Functions	Weeks 28-33
Unit VI: Rational Functions	Weeks 34-37
Unit VII: Sequences and Series	Week 38
Unit VIII: Conic Sections	Weeks 39-40

Section VI: Technology Skills

Students in *Algebra II Honors* are required to complete the technology skills components of the curriculum:

- Kuta
- Edulastic
- TI-89 Calculator
- Desmos
- Google Sheets/Slides/Docs

Section VII: Primary Texts and Year-Long Instructional Resources

The following texts and instructional resources are employed in *Algebra II Honors*:

- Common Sense Education (www.commonsense.org)
- Desmos
- Edulastic

Section VIII: Grading Formula and Assessment Modes

Marking period grades in *Algebra II Honors* 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 *Algebra II Honors* 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 *Algebra II Honors* instructional team to inform future learning and to measure student growth.

Section IX: Unit Templates

The following unit templates have been established for the *Algebra II Honors* curriculum by the *Algebra II Honors* instructional team:

Unit I: Functions		
Unit Summary		
Students will begin with a brief review of real numbers, linear functions, systems of equations, and simple inequalities. Students will review simple inequalities and then expand into compound, and absolute value inequalities; they will learn how to represent their answers in interval notation. The heart of the unit is the study of basic function concepts: functions as relations, operations with functions, compositions of functions, and inverses of functions.		
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 *Algebra II Honors:* ● *2023 New Jersey Student Learning Standards: Mathematics* ○ MP.1-8 ○ A.CED.A.1-3, A.REI.A.1-2, B.3, C.5-6, & D.10-12, F.IF.A.1-2 & C.8, F.BF.A.1c & B.4a-c ● *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 ● *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking* ○ 8.1.12.DA.1 ● *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills* ○ 9.4.12.CI.1, 9.4.12.CI.3, 9.4.12.CT.2		
Unit Essential Questions	**Unit Enduring Understandings**	
● What skills does one need to recall from *Algebra I*? ● How can solutions to inequalities be represented? ● How are operations on functions performed? ● What restricts the domain of a function?	● Simplifying expressions, solving and graphing linear equations, and solving systems of equations are skills recalled from *Algebra I*. ● Solutions to inequalities can be represented by using graphs or through interval notation to show a set of values/points. ● One can add, subtract, multiply, and divide functions, as well as compose functions and find their inverses. ● Dividing or taking square roots may cause restrictions on the domain.	
Evidence of Learning		
Formative & Alternative Assessments: ● Classwork ● Homework ● Algebra I Review problem set ● Anthropometry Lab ● Inequalities Enrichment ● Functions Quiz ● Individual student check-ins with teacher	**Benchmark & Summative Assessments:** ● *Algebra I* Review Benchmark	**Resources Needed:** ● Textbook ● Desmos ● Kuta Software ● Various teacher-made PowerPoints and WSs ● Edulastic

Unit II: Transformations of Functions
Unit Summary
Students will understand basic transformations of the graphs of quadratic, radical, and absolute value functions. Students will graph piecewise functions. This will combine their skills from Unit I with Unit II to represent graphs and their transformations within a particular interval.
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 *Algebra II Honors:*

- *2023 New Jersey Student Learning Standards: Mathematics*
  - MP.1-8
  - A.REI.D.10, F.IF.C.7a-b, C.8a & 9, F.BF.A.1, B.3-4
- *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
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.1.12.DA.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  - 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2

Unit Essential Questions	Unit Enduring Understandings
• What information is needed to graph absolute value, radical, and quadratic functions? • How can piecewise-defined functions be graphed? • What graphs have all real numbers as their domain? If not, what restricts the domain?	• Using transformations, graphs can be created by using translations to find the vertex and reflections, stretches, and compressions to find an additional point. • Graphing piecewise-defined functions involves breaking down the function into different segments or intervals, each with its own expression, and then plotting these segments separately on the same coordinate system. • Most commonly encountered functions in mathematics and real-world applications have all real numbers as their domain. These functions can be applied to any real number input without any restrictions. Examples of such functions include linear functions, quadratic functions, cubic functions, exponential functions, trigonometric functions (like sine and cosine), and many others. Certain types of functions have restricted domains due to mathematical limitations or practical considerations. • Students must graph each individual function over the specific domain assigned.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Classwork • Homework • Domain/range activity • Inverses Edulastic • Desmos Piecewise Polygraph • Desmos Piecewise Functions Card Sort • Graphing Transformations quiz • Individual student check-ins with teacher	• Inverses and Composition Assessment • Functions Test	• Textbook • Desmos • Kuta Software • Various teacher-made PowerPoints and WSs • Edulastic • Common Sense Lesson- "Curated Lives"

Unit III: Quadratic Functions

Unit Summary

Students will find solutions to quadratic equations and inequalities using various methods with real and imaginary solutions. Complex numbers and their operations are introduced. Students will understand the relationship between the discriminant, the number of real solutions, and the graph of the quadratic. Students will graph quadratics in vertex and standard form. Students will use their knowledge of quadratics to solve real-world examples.

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 *Algebra II Honors:*

- *2023 New Jersey Student Learning Standards: Mathematics*
  - MP.1-8
  - N.CN.A.1-3 & C.7-9, A.SSE.B.3a-b, A.CED.A.1-3, A.REI.B.4, C.7 & D.10, F.IF.B.4-5, C.7a & 8a, F.BF.B.3-4a-c
- *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
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.1.12.DA.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  - 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2

Unit Essential Questions	Unit Enduring Understandings
• How can quadratic equations be solved? • What happens when the answer results in the square root of a negative number? • What does the number of real solutions reveal about the graph of the quadratic function?	• Quadratic equations can be solved using either factoring, completing the square, square root method, or quadratic formula. • The resulting answer is imaginary, where the square root of -1 is *i*. • The number of real solutions indicates the number of x-intercepts the parabola will have.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Classwork • Homework • "Will it hit the hoop?" Desmos activity • Quadratic Inequalities cooperative • Complex numbers quiz • Solving quadratics quiz • Individual student check-ins with teacher	• Quadratics Test	• Textbook • Desmos • Kuta Software • Various teacher made PowerPoints and WSs • Edulastic

Unit IV: Polynomial Functions

Unit Summary

Students will be introduced to polynomials, perform operations, factor polynomials, solve polynomial equations, identify the zeros of polynomial functions, graph polynomials with and without their graphing calculator, and identify key characteristics, and write equations of polynomial functions.

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 *Algebra II Honors:*

- *2023 New Jersey Student Learning Standards: Mathematics*
  - MP.1-8
  - N.CN.A.1-2, A.SSE.1a & 2, A.APR.A1, B.2-3, & C.4, A.CED.A.2, A.REI.D.10-11, F.IF.B.4 & C.7c
- *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
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.1.12.DA.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  - 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2

Unit Essential Questions	Unit Enduring Understandings
• What operations can be performed with polynomials? • How can one solve a polynomial equation? • What are the important features on the graph of a polynomial function?	• Polynomials can be added, subtracted, multiplied, and divided. They can also be classified by degree and number of terms. • Polynomial equations can be solved using factoring, rational root theorem with synthetic division, and/or quadratic formula. • Polynomials have important features such as x-intercepts, y-intercepts, and maxima/minima.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Classwork • Homework • TI-89 scavenger hunt • Polynomials problem set • Civision activity • Solving enrichment • Writing Polynomials Desmos activity • Graphing Polynomials calculator quiz • Factoring Polynomials quiz • Long and Synthetic Division quiz • Solving Polynomials quiz • Polynomial presentations	• Polynomials Test	• Textbook • Desmos • Kuta Software • Various teacher made PowerPoints and WSs • Edulastic

Unit V: Exponential and Logarithmic Functions

Unit Summary

Students will discover the properties of logarithmic and exponential functions, simplify expressions, solve equations, and graph exponential and logarithmic functions. They will identify the domain and range of their graphs as well as find and graph their inverses and recognize the relationship they share. Students will apply what they learned to understand exponential growth and decay along with other real-world applications.

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 *Algebra II Honors:*

- *2023 New Jersey Student Learning Standards: Mathematics*
  - MP.1-8
  - A.SSE.B.3, A.REI.D.11, F.IF.B.4-5, C.7e & C.8b, F.BF.A.1c & B.3-5, F.LE.A.1 & 3-4
- *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
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.1.12.DA.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  - 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2

Unit Essential Questions	Unit Enduring Understandings
• What is the relationship between a logarithmic and exponential function? • Which properties of logarithmic and exponential functions are important? • What are the important characteristics/features of a logarithmic or exponential graph? • Where can applications of these types of functions be seen in the real world?	• Logarithmic and exponential functions are inverses of one another. Their graphs are a reflection over the line y=x. • Students must be able to recall/use the product, quotient, power, and equality properties of logarithmic and exponential functions in order to simplify expressions and solve equations. • Logarithmic and exponential graphs have an asymptote, restricting the domain (logarithmic) or range (exponential). The graphs do not have a constant slope and are either strictly increasing or strictly decreasing. • Applications of logarithmic and exponential functions can be found in models of exponential decay/growth, compound interest, Newton's law of Cooling, etc.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Classwork • Homework • Exponents enrichment • Marble slide Desmos • Polygraph activity Desmos	• Exponential and Logarithm Tests	• Textbook • Desmos • Kuta Software • Various teacher made PowerPoints and WSs • Edulastic

• Tic Tac Toe application problems • Graded applications problem • Properties and solving quiz • Graded warm-up quiz graphing exponentials • Graphing quiz • Individual student check-ins with teacher		

Unit VI: Rational Functions		
Unit Summary		
Students will graph rational functions, multiply, divide, add, and subtract rational expressions, solve rational equations and inequalities, and solve direct, inverse, and joint variation 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 *Algebra II Honors:*
• *2023 New Jersey Student Learning Standards: Mathematics*
  ○ MP.1-8
  ○ F.IF.B.4-5 & C.7d, F.BF.B.3, A.REI.A.2, A.APR.D.6, A.CED.A.1
• *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
• *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  ○ 8.1.12.DA.1
• *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  ○ 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2		

Unit Essential Questions	**Unit Enduring Understandings**	
• What are the key features of the graph of a rational function? • How does one solve a rational equation?	• Intercepts, holes, and asymptotes are used to graph rational functions. Holes and vertical asymptotes are created because of restrictions in the domain of the function. Horizontal asymptotes dictate the end behavior of the graph. • All terms in a rational equation should be multiplied by the common denominator to effectively solve a rational equation. Restrictions on the domain may affect the number of solutions.	
Evidence of Learning		
Formative & Alternative Assessments: • Classwork • Homework • Inequalities graded warm-up • Operations and Solving Quiz • Graphing and Writing Quiz • Individual student check-ins with teacher	**Benchmark & Summative Assessments:** • Unit VI Project	**Resources Needed:** • Textbook • Desmos • Kuta Software • Various teacher made PowerPoints and WSs • Edulastic

Unit VII: Sequences and Series
Unit Summary
Students will learn about different number patterns, including arithmetic and geometric sequences and series. They will be able to find a given term in a sequence as well as find partial and infinite sums. Students will explore real-world data that follows these specific patterns.
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 *Algebra II Honors:*
• *2023 New Jersey Student Learning Standards: Mathematics*
  ○ MP.1-8
  ○ F.BF.A.2, F.IF.A.3, A.SSE.B.4

- *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
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.1.12.DA.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  - 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2

Unit Essential Questions	Unit Enduring Understandings
• What constitutes an arithmetic sequence? • What constitutes a geometric sequence? • How can a series have an infinite sum?	• Arithmetic sequences have common differences. • Geometric sequences have common ratios. • Series can converge and diverge. A series is said to be convergent if the sum of its terms approaches a finite value as the number of terms increases. A series is divergent if the sum of its terms grows without bounds as more terms are added.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Classwork • Homework • Sequences and Series Quiz • Individual student check-ins with teacher	• Unit VII Project	• Textbook • Desmos • Kuta Software • Various teacher-made PowerPoints and WSs • Edulastic

Unit VIII: Conic Sections

Unit Summary

Students will write equations and graph equations of conic sections, and apply completing the square to convert from standard to general form. Students will understand conics in the world around them.

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 *Algebra II Honors:*

- *2023 New Jersey Student Learning Standards: Mathematics*
  - MP.1-8
  - G.GPE.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
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.1.12.DA.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
  - 9.4.12.CI.1,9.4.12.CI.3, 9.4.12.CT.2

Unit Essential Questions	Unit Enduring Understandings
• What is a conic section? • How do we write equations of conics in standard form? • How do the graphs of conic sections relate to real-world situations?	• A conic section is an intersection of a right circular cone and a plane. This can create a circle, ellipse, hyperbola, or parabola. • Completing the square is needed to write equations of conics in standard form. • The graphs of conic sections are used to model real-world applications such as cross-sections of objects, the receiving area of radio signals, the paths of planets around the sun, and navigation systems.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Classwork • Homework • Circles and Ellipses Quiz • Hyperbola and Parabola Quiz • Individual student check-ins with teacher	• Q4 Wrap-Up Summative	• Textbook • Desmos • Kuta Software • Various teacher-made PowerPoints and WSs • Edulastic

Section X: Unit Reflection

The *Algebra II Honors* instructional team must confer upon the completion of each instructional unit in the *Algebra II Honors* 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 *Algebra II Honors* curriculum.

Unit Reflection Form: *Algebra II Honors*			
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 21st 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;			
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)