PITTSGROVE TOWNSHIP SCHOOL DISTRICT

Pittsgrove Township
School District
P.R.I.D.E. Patience Respect Integrity Diligence Empathy

Course Name: Algebra II Honors	**Grade Level(s): 9,10,11**
Department: Math	**Credits: 5**
BOE Adoption Date: July 2013	**Revision Date(s): August 2019**

Course Description

This course provides continued work with variables and polynomials, solving exponential, quadratic and rational equations and inequalities, graphing, and introduces the student to radicals, complex numbers, and logarithms. Emphasis is on problem solving. Class work will include presentation of course material by the instructor, accompanied by appropriate problem solving assignments.

The following are the 8 Mathematical Practices Standards:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Mission Statement

The Pittsgrove Township School District believes in growing all learners to thrive. *The district offers an intellectually rigorous, dynamic curriculum aligned to state and national standards coupled with research-based practices in classrooms. The Pittsgrove Township School District strives to highlight critical thinking, problem-solving, intercultural literacy, digital literacy, collaboration, innovation, and a growth mindset as part of the instructional core of learning. The district provides high quality resources to provide young people the knowledge they need to approach the future as leaders and learners.*

Curriculum & Instruction Goals

1. To ensure students are college and career ready upon graduation
2. To vertically and horizontally align curriculum PreK-12 to ensure successful transition of students at each grade level
3. To identify individual student strengths and weaknesses utilizing various assessment measures (formative, summative, alternative, etc.) so as to differentiate instruction while meeting the rigor of the applicable content standards
4. To improve student achievement as assessed through multiple measures including, but not limited to, state testing, local assessments, and ongoing progress monitoring

How to Read this Document

This curricular document contains both a *pacing guide* and *curriculum units*. The pacing guide serves to communicate an estimated timeframe as to *when* critical knowledge and skills will be taught throughout the year. The pacing, however, may differ slightly depending upon the unique needs of each learner. The *curriculum units* contain more detailed information as to the content, goals, objectives, instructional strategies, resources, and assessments.

NJ Administrative Code and Statutes Key
^=Amistad Law **O=Diversity & Inclusion Law** **<>=Holocaust** **+=LGBT and Disabilities Law** ***=AAPI (Asian American and Pacific Islanders)** **$=Financial Literacy** **Use this key to understand where the NJ mandates are being implemented in the K-12 curriculum units.**

Pacing Guide

Course Title: Algebra II Honors

Prerequisite(s): Successful completion of Algebra I CP with an "A" or successful completion of Algebra I Honors with a "B" or higher.

Unit Title	Duration/ Month(s)	Related Standards	Learning Goals	Critical Knowledge and Skills
Unit 1: Quadratic Functions	13 days	NJSLS.F.IF.B.4 NJSLS.F.IF.C.9 NJSLS.N.CN.A.1-2 NJSLS.N.CN.C.7 NJSLS.A.SSE.A.2 NJSLS.A.SSE.B.3.a-b NJSLS.A.APR.C.4 NJSLS.A.CED.A.1 NJSLS.A-REI.B.4.a-b NJSLS.A.REI.C.7 NJSLS.G.GPE.A.2 NJSLS.HS-M MP.1 MP.2 MP.4 MP.5 MP.6 MP.7 Interdisciplinary: Technology: NJSLS8.2.12.C.5	The students will interpret key features of graphs in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. (2-4 days) The students will be able to perform arithmetic operations with complex numbers. (1-3 days) The students will be able to solve a quadratic equation using a variety of methods and will be able to recognize when the solutions are complex. (9-10 days)	Learning objectives for this Unit: To identify quadratic functions and graphs To model data with quadratic functions To graph quadratic functions To find maximum and minimum values of quadratic functions To use the vertex form of a quadratic function To find common and binomial factors of quadratic expressions To factor special quadratic

		Career Ready Practices: CRP6 CRP11 Interdisciplinary: ELA: NJSLSA.8 Career Exploration: NJSLS.9.3.ST-SM.2		expressions To solve quadratic equations by factoring and by finding square roots To solve quadratic equations by graphing To identify and graph complex numbers To add, subtract, and multiply complex numbers To solve equations and rewrite functions by completing the square To solve equations using the quadratic formula To determine the type of solutions by using the discriminant
Unit 2: Polynomials and Polynomial Functions	17 days	NJSLS.A.SSE.A.1 NJSLS.A.SSE.B.3 NJSLS.A.APR.A.1	The students will perform arithmetic operations on polynomials. (2 days) The students will understand the	Learning objectives for this Unit: To classify polynomials To model data using

			relationship between zeros and factors of polynomials by using the remainder theorem and the fundamental theorem of algebra. (6 days) The students will be able to identify the zeros of polynomials and use the zeros to construct a rough graph of the function it represents. (6 days)	polynomial functions To calculate the average rate of change To write a function from its zeros To divide polynomials using long and synthetic division To solve polynomial equations by graphing and factoring To solve equations using the Rational, Irrational, and Imaginary Root Theorems To use the Fundamental Theorem of Algebra to find all of the zeros of a polynomial function
Unit 3: Rational Exponents and Radical Functions	15 days	NJSLS.N.RN.A.1-2 NJSLS.A.REI.A.1-2 NJSLS.F.BF.A.1.b-c NJSLS.F.BF.B.3-4 NJSLS.F.IF.C.7.b NJSLS.N.CN.A.3 NJSLS.N.CN.C.8	The students will be able to extend the properties of exponents to rational exponents. (4 days) The students will be able to solve simple radical and rational equations in one variable, and give	Learning objectives for this Unit: To simplify nth roots To multiply and divide radical expressions

		NJSLS.HS-M MP.1 MP.2 MP.3 MP.6 MP.7 MP.8 Interdisciplinary: Technology: NJSLS.8.2.12.E.1 Career Ready Practices: CRP4 Financial Literacy: 9.1.12.E.3 Interdisciplinary: SCIENCE: NJSLS-S.MS-PS3-1 Career Exploration: NJSLS.9.3.ST-ET.5	examples showing how extraneous solutions may arise. (6 days) The students will be able to combine standard function types using arithmetic operations. (6 days)	To add and subtract radical expressions To multiply and divide binomial radical expressions To simplify expressions with rational exponents To solve radical equations To add, subtract, multiply, and divide functions To find the composite of two functions To find the inverse of the relation or function To graph radical functions
Unit 4: Exponential and Logarithmic Functions	Length: 13 days	NJSLS.A.SSE.B.3.c NJSLS.F.BF.B.4-5 NJSLS.F.LE.A.4 NJSLS.F.LE.B.5 NJSLS.F.IF.C.8 NJSLS.F.IF.C.7e NJSLS.F.LE.A.2 NJSLS.HS-M MP.1 MP.2	The students will be able to use the properties of exponents to transform expressions for exponential functions. (5 days) The students will be able to find inverse functions and understand the inverse relationship between exponents and logarithms and use this relationship to solve problems.	Learning objectives for this Unit: To model exponential growth and decay To use properties of exponential functions To write and evaluate logarithmic expressions

		MP.3 MP.4 MP.5 MP.6 MP.7 MP.8 Interdisciplinary: Technology: NJSLS.8.2.12.B.2 Career Ready Practices: CRP3 CRP5 Financial Literacy: 9.1.12.A.9 9.1.12.B.2 9.1.12.B.8 Interdisciplinary: ELA: NJSLSA.R4 SCIENCE: NJSLS-S.HS-PS1-C SCIENCE: NJSLS-S.HS-ESS1-6 Career Exploration: NJSLS.9.3.ST.2	(5 days)	To solve exponential and logarithmic equations To evaluate natural logarithmic expressions To solve equations using natural logarithms
Unit 5: Rational Functions	11 days	NJSLS.A.APR.D.7 NJSLS.A.REI.A.2 NJSLS.F.IF.C.7.d MP.1 MP.4 MP.6 Interdisciplinary:	The students will be able to rewrite rational expressions and perform basic operations on them. (4 days) The students will be able to solve simple radical and rational equations in one variable, and give examples showing how extraneous	Learning objectives for this Unit: To write and interpret direct variation equations To use inverse and combined variation

		Technology: NJSLS.8.2.12.E.4 Career Ready Practices: CRP.2 Interdisciplinary: ELA: NJSLSA.R7 Career Exploration: NJSLS.9.3.ST-SM.1	solutions may arise. (2 days) The students will be able to identify zeros and asymptotes of rational functions. (5 days) The students will be able to calculate and interpret the average rate of change of a function over a specified interval. (1 days)	To understand translations of inverse variations To identify properties of rational functions To simplify rational expressions To multiply and divide rational expressions To add and subtract rational expressions To simplify complex fractions To solve rational equations
Unit 7: Sequences and Series	11 days	NJSLS.A.SSE.B.4 NJSLS.F.BF.A.1 NJSLS.F.BF.A.2 NJSLS.HS-M MP.2 MP.3 MP.4 MP.6 MP.7 MP.8	The students will be able to derive the formula for the sum of a finite geometric series (when the common ratio is not one) and use the formula to solve problems. (4 days) The students will be able to write arithmetic and geometric sequences both recursively and with and explicit formula, and use	Learning objectives for this Unit: To identify mathematical patterns To use a formula for finding the nth term of a sequence To identify and generate arithmetic sequences

		Interdisciplinary: Technology: NJSLS.8.2.12.E.4 Career Ready Practices: CRP4 CRP8 Interdisciplinary: ELA: NJSLSA.W.1 Career Exploration: NJSLS.9.3.ST-SM.1	them to model situations, and translate between the two forms. (2 days)	To identify and generate geometric sequences To write and evaluate arithmetic series To use summation notation To evaluate a finite/infinite series

Instructional Unit Map				
Course Title: Algebra II Honors				
Unit Title	Unit 1: Quadratic FUNctions		**Start Date:**	September/February
			Length of Unit:	13 days
Content Standards *What do we want them to know, understand, & do?*	NJSLS.F.IF.B.4 NJSLS.F.IF.C.9 NJSLS.N.CN.A.1-2 NJSLS.N.CN.C.7 NJSLS.A.SSE.A.2 NJSLS.A.SSE.B.3.a-b NJSLS.A.APR.C.4 NJSLS.A.CED.A.1 NJSLS.A-REI.B.4.a-b NJSLS.A.REI.C.7 NJSLS.G.GPE.A.2 NJSLS.HS-M	**Learning Goals**	The students will interpret key features of graphs in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. (2-4 days) The students will be able to perform arithmetic operations with complex numbers. (1-3 days) The students will be able to solve a quadratic equation using a variety	

<table>
<tr><td></td><td>MP.1
MP.2
MP.4
MP.5
MP.6
MP.7</td><td></td><td colspan="3">of methods and will be able to recognize when the solutions are complex. (9-10 days)</td></tr>
<tr><td>Essential Questions</td><td colspan="5">● How are quadratic functions used to represent real-life situations?
● How can quadratic functions be manipulated to appear in different forms?
● What makes a function quadratic?
● How can quadratic equations be solved?</td></tr>
<tr><td rowspan="2">Assessments
How will we know they have gained the knowledge & skills?</td><td colspan="2">Formative</td><td colspan="2">Summative</td><td>Alternative</td></tr>
<tr><td colspan="2">● Warm UPs/Exit Tickets
● Choral and individual responses to questioning verbally and on the SmartBoard
● Thumbs up/down, indicators, and other interactive answering strategies
● Graded Homework
● Guided Questions</td><td colspan="2">● Quizzes
● End of Chapter Tests
● Extended Constructed Response Questions
● Projects</td><td>● Derive The Quadratic Formula
● Chapter 1 Alternative Assessment and Math Journal</td></tr>
<tr><td>Unit Pre-Assessment(s)
What do they already know?</td><td colspan="5">Standardized TEST PRACTICE: CONTEXT-BASED MULTIPLE CHOICE pg 84-85 #1-8 all, 10-22 even.</td></tr>
<tr><td>Instructional Strategies/Student Activities</td><td colspan="5">● Warm UPs
● Homework Displays</td></tr>
</table>

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<tr><td></td><td colspan="4">

- Direct Instruction
- Guided Practice
- Cooperative Learning (Group Work)
- Modeling
- Think-Pair-Share (Buddy System)
- Exit Tickets
- Standardized Test Practice

</td></tr>
<tr><td rowspan="2">Instructional/Assessment Scaffolds (Modifications /Accommodations) – planned for prior to instruction</td><td>English Language Learners</td><td>Special Education Learners</td><td>Struggling Learners</td><td>Advanced Learners</td></tr>
<tr><td>

- Manipulatives
- Oral Directions (repeat when necessary)
- Preferred Seating
- Calculator
- Pictures/Graphics
- Flash Card Wall
- “Classroom Buddy”
- Key terms highlighted
- Provide Examples/Show Work
- Immediate Feedback
- Assessment

</td><td>

- Flash Card Wall
- Oral Directions (repeat when necessary)
- Preferred Seating
- Calculator
- Key Terms Highlighted
- Pictures/Graphics
- Manipulatives
- Notebook of Key Terms
- Additional Time
- Assessment retake (one

</td><td>

- Provide Extra Time
- Manipulatives
- Pictures/Graphics
- Provide Examples/Show Work
- Chunk long-term assignments
- Assessment Retake (one per marking period)

</td><td>

- Tiered Assignments
- Flexible Grouping
- Independent Study

</td></tr>
</table>

	Retake (one per marking period)	per marking period) • Provide Examples/Show Work		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process) • Interactive Notebook/note-taking sheet • Bi-Weekly Progress Reports • Desmos Activities		**Expression** (Products and/or Performance) • Quizzes and Tests • Derivation of Quadratic Formula • SAT Worksheet	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier 2**:** polynomial, quadratic, function, graph, terms, factors, simplify, solve, variable, linear, vertex, coordinates, orientation, inequality, table, add, sum, subtract, difference, multiply, product, divide, quotient, prime, composite. Tier 3**:** complete the square, Quadratic Formula, standard form, intercept form, vertex form, complex number, imaginary number			
Integration of Technology SAMR	S: Use graphing calculator to add, subtract, multiply and divide quickly. A: Use a graphing calculator to locate vertex and graph quadratic functions. M: Desmos Activities - Polygraph Parabolas, Factoring Quadratic Trinomials, Factor by Grouping Sort, and Marbleslides S, A and M: Khan Academy or iXL remediation			
Interdisciplinary Connections NJ Student Learning Standards	Technology: NJSLS8.2.12.C.5 Career Ready Practices: CRP6 CRP11 Interdisciplinary:			

<table>
<tr><td></td><td colspan="2">ELA: NJSLSA.8

Career Exploration:
NJSLS.9.3.ST-SM.2</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td>Financial, Economic, Business and Entrepreneurial Literacy

Environmental Literacy</td><td>Critical Thinking and Problem Solving
Communication
Collaboration
Information, Communications, and Technology Literacy
Productivity & Accountability
Leadership & Responsibility
Flexibility & Adaptability
Social and Cross Cultural Skills
Initiative & Self Direction</td></tr>
<tr><td>Resources/Materials</td><td colspan="2">Resources:
iXL
Larson (2012) Algebra II Textbook
Larson Assessment Book
Khan Academy
Desmos.com
Teacher-generated worksheets
Standardized Test Practice

Materials:
Chromebooks
Malipulatives
Flash Cards</td></tr>
</table>

Instructional Unit Map				
Course Title: Algebra II Honors				
Unit Title	Unit 2: Polynomials and Polynomial FUNctions		**Start Date:**	September/February
			Length of Unit:	17 days
Content Standards *What do we want them to know, understand, & do?*	NJSLS.A.SSE.A.1 NJSLS.A.SSE.B.3 NJSLS.A.APR.A.1 NJSLS.A.APR.B.2 NJSLS.A.APR.B.3 NJSLS.A.APR.D.6 NJSLS.F.IF.C.7 NJSLS.N.CN.C.9 NJSLS.A.APR.C.4 NJSLS.A.CED.A.1 MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	**Learning Goals**	The students will perform arithmetic operations on polynomials. (2 days) The students will understand the relationship between zeros and factors of polynomials by using the remainder theorem and the fundamental theorem of algebra. (6 days) The students will be able to identify the zeros of polynomials and use the zeros to construct a rough graph of the function it represents. (6 days)	
Essential Questions	● How are higher-degree polynomial functions used to represent real-life situations? ● How are higher-degree polynomial functions similar to and different from quadratic functions? ● How are the factors, x-intercepts, and zeros of a function related? ● How can you tell how many zeros a function will have? ● How can higher-degree polynomials be solved?			

Assessments *How will we know they have gained the knowledge & skills?*	**Formative**	**Summative**	**Alternative**
	• Warm UPs/Exit Tickets • Choral and individual responses to questioning verbally and on the SmartBoard • Thumbs up/down, indicators, and other interactive answering strategies • Graded homework • Guided Questions	• Quizzes • End of Chapter Tests • Extended Constructed Response Questions • Projects	• Chapter 2 Alternative Assessment and Math Journal
Unit Pre-Assessment(s) *What do they already know?*	Standardized TEST PRACTICE: SHORT RESPONSE pg 162-163 #2-10 even, 11-19 all, 21.		
Instructional Strategies/Student Activities	• Warm UPs • Homework Displays • Direct Instruction • Guided Practice • Cooperative Learning (Group Work) • Modeling • Graphing Templates • Think-Pair-Share (Buddy System) • Exit Tickets • Standardized Test Practice		

Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
	• Manipulatives • Oral Directions (repeat when necessary) • Preferred Seating • Calculator • Pictures/Graphics • Flash Card Wall • "Classroom Buddy" • Key terms highlighted • Provide Examples/Show Work • Immediate Feedback • Assessment Retake (one per marking period)	• Flash Card Wall • Oral Directions (repeat when necessary) • Preferred Seating • Calculator • Key Terms Highlighted • Pictures/Graphics • Manipulatives • Notebook of Key Terms • Additional Time • Assessment retake (one per marking period) • Provide Examples/S	• Provide Extra Time • Manipulatives • Pictures/Graphics • Provide Examples/Show Work • Chunk long-term assignments • Assessment Retake (one per marking period)	• Tiered Assignments • Flexible Grouping • Independent Study

		how Work		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	• Interactive Notebook/note-taking sheet • Bi-Weekly Progress Reports • Desmos Activities		• Quizzes and Tests • Derivation of Quadratic Formula • SAT Worksheet	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier 2: polynomial, polynomial function, graph, terms, factors, simplify, solve, variable, linear, vertex, coordinates, orientation, table, add, sum, subtract, difference, multiply, product, divide, quotient, prime, composite, end behavior, factored completely, factor by grouping, repeated solution, quadratic form, local minimum, local maximum Tier 3: synthetic substitution, polynomial, finite differences, polynomial long division			
Integration of Technology SAMR	S: Use graphing calculator to add, subtract, multiply and divide quickly. A: Use graphing calculator to locate zeros, minima, maxima and graph higher degree polynomial functions. M: Desmos Activities - Match My Polynomial, Introduction to Polynomial Graphing, Exponent Rules S, A and M: Khan Academy or iXL remediation			
Interdisciplinary Connections NJ Student Learning Standards	Technology: NJSLS.8.2.12.B.4 Career Ready Practices: CRP1 CRP2 CRP11 Interdisciplinary: ELA: NJSLSA.R1 NJSLSA.R4 NJSLSA.RL.11-12.4 NJSLSA.W4			

<table>
<tr><td></td><td colspan="2">NJSLSA.W.11-12.4
NJSLSA.RI.11-12.4

Career Exploration:
NJSLS.9.2.12.C.1</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td>Global Awareness

Financial, Economic, Business and Entrepreneurial Literacy

Environmental Literacy</td><td>Critical Thinking and Problem Solving
Communication and Collaboration
Information, Communications, and Technology Literacy
Productivity & Accountability
Leadership & Responsibility
Flexibility & Adaptability
Social and Cross Cultural Skills
Initiative & Self Direction</td></tr>
<tr><td>Resources/Materials</td><td colspan="2">Resources:
iXL
Larson (2012) Algebra II Textbook
Larson Assessment Book
Khan Academy
Desmos.com
Teacher-generated worksheets
Standardized test worksheets

Materials:
Chromebooks
Malipulatives
Flash Cards</td></tr>
</table>

Instructional Unit Map				
Course Title: Algebra II Honors				
Unit Title	Unit 3: Rational Exponents and Radical FUNctions		**Start Date:**	October/March
			Length of Unit:	15 days
Content Standards *What do we want them to know, understand, & do?*	NJSLS.N.RN.A.1-2 NJSLS.A.REI.A.1-2 NJSLS.F.BF.A.1.b-c NJSLS.F.BF.B.3-4 NJSLS.F.IF.C.7.b NJSLS.N.CN.A.3 NJSLS.N.CN.C.8 NJSLS.HS-M MP.1 MP.2 MP.3 MP.6 MP.7 MP.8	**Learning Goals**	The students will be able to extend the properties of exponents to rational exponents. (4 days) The students will be able to solve simple radical and rational equations in one variable, and give examples showing how extraneous solutions may arise. (5 days) The students will be able to combine standard function types using arithmetic operations. (6 days)	
Essential Questions	● How are rational exponents and radicals related? ● How are the graphs of polynomial functions similar to and different from radical functions? ● How is it possible to simplify expressions in different ways? ● How are functions used to save you money at Kohls???? ● How are rational exponents used to solve radical equations?			

<table>
<tr><td rowspan="2">Assessments
How will we know they have gained the knowledge & skills?</td><th>Formative</th><th>Summative</th><th>Alternative</th></tr>
<tr><td>Warm UPs/Exit Tickets
Choral and individual responses to questioning verbally and on the SmartBoard
Thumbs up/down, indicators, and other interactive answering strategies
Graded homework
Guided Questions</td><td>Quizzes
End of Chapter Tests
Extended Constructed Response Questions
Projects</td><td>Chapter 3 Alternative Assessment and Math Journal</td></tr>
<tr><td>Unit Pre-Assessment(s)
What do they already know?</td><td colspan="3">Standardized TEST PRACTICE: EXTENDED RESPONSE pg 224-225 #3-17 all.</td></tr>
<tr><td>Instructional Strategies/Student Activities</td><td colspan="3">Warm UPs
Homework Displays
Direct Instruction
Guided Practice
Cooperative Learning (Group Work)
Modeling
Graphing Templates
Think-Pair-Share (Buddy System)
Exit Tickets
Standardized Test Practice</td></tr>
</table>

Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
	• Manipulatives • Oral Directions (repeat when necessary) • Preferred Seating • Calculator • Pictures/Graphics • Flash Card Wall • "Classroom Buddy" • Key terms highlighted • Provide Examples/Show Work • Immediate Feedback • Assessment Retake (one per marking period)	• Flash Card Wall • Oral Directions (repeat when necessary) • Preferred Seating • Calculator • Key Terms Highlighted • Pictures/Graphics • Manipulatives • Notebook of Key Terms • Additional Time • Assessment retake (one per marking period) • Provide	• Provide Extra Time • Manipulatives • Pictures/Graphics • Provide Examples/Show Work • Chunk long-term assignments • Assessment Retake (one per marking period)	• Tiered Assignments • Flexible Grouping • Independent Study

		Examples/S how Work		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	• Interactive Notebook/note-taking sheet • Bi-Weekly Progress Reports • Desmos Activities		• Quizzes and Tests • Derivation of Quadratic Formula • SAT Worksheet	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier 2: polynomial, function, graph, simplify, solve, linear, coordinates, table, index of a radical, nth root of a, power function, radical function, composition, radical equation, simplest form of a radical, like radicals. Tier 3: domain, range, relation, function, inverse relation, inverse function			
Integration of Technology SAMR	S: Use graphing calculator to add, subtract, multiply and divide quickly. A: Use graphing calculator to locate vertex and graph quadratic functions. M: Desmos Activities - Finding Domain and Range, Radical Transformations S, A and M: Khan Academy or iXL remediation			
Interdisciplinary Connections NJ Student Learning Standards	Technology: NJSLS.8.2.12.E.1 Career Ready Practices: CRP4 Financial Literacy: NJSLS.PFL.9.1.12.E.3 Interdisciplinary: SCIENCE: NJSLS-S.MS-PS3-1 Career Exploration: NJSLS.9.3.ST-ET.5			

21st Century Themes/Skills P21 Framework	Themes	Skills
	Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Environmental Literacy	Critical Thinking and Problem Solving Communication and Collaboration Information, Communications, and Technology Literacy Productivity & Accountability Leadership & Responsibility Flexibility & Adaptability Social and Cross Cultural Skills Initiative & Self Direction
Resources/Materials	Resources: iXL Larson (2012) Algebra II Textbook Larson Assessment Book Khan Academy Desmos.com Teacher-generated worksheets Standardized test worksheets Materials: Chromebooks Malipulatives Flash Cards Patty Paper Colored Pencils Parent Functions	

Instructional Unit Map					
Course Title: Algebra II Honors					
Unit Title	Unit 4: Exponential and Logarithmic Functions			**Start Date:**	November/April
				Length of Unit:	13 days
Content Standards *What do we want them to know, understand, & do?*	NJSLS.A.SSE.B.3.c NJSLS.F.BF.B.4-5 NJSLS.F.LE.A.4 NJSLS.F.LE.B.5 NJSLS.F.IF.C.8 NJSLS.F.IF.C.7e NJSLS.F.LE.A.2 NJSLS.HS-M MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	**Learning Goals**	The students will be able to use the properties of exponents to transform expressions for exponential functions. (6 days) The students will be able to find inverse functions and understand the inverse relationship between exponents and logarithms and use this relationship to solve problems. (7 days)		
Essential Questions	● How are exponential functions and logarithmic functions related? ● How are exponential and logarithmic functions used to represent real-life situations?				

<table>
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How are the graphs of exponential and logarithmic functions similar to and different from radical and polynomial functions?
How do exponential functions help you save money?
How are exponential and logarithmic equations solved?

</td></tr>
<tr><td rowspan="2">Assessments
How will we know they have gained the knowledge & skills?</td><td>Formative</td><td>Summative</td><td>Alternative</td></tr>
<tr><td>

Warm UPs/Exit Tickets
Choral and individual responses to questioning verbally and on the SmartBoard
Thumbs up/down, indicators, and other interactive answering strategies
Graded homework
Guided Questions

</td><td>

Quizzes
End of Chapter Tests
Extended Constructed Response Questions
Projects

</td><td>

Chapter 4 Alternative Assessment and Math Journal

</td></tr>
<tr><td>Unit Pre-Assessment(s)
What do they already know?</td><td colspan="3">Standardized TEST PRACTICE: MULTIPLE CHOICE pg 298-299 #1-11 all, 12-22 even.</td></tr>
<tr><td>Instructional Strategies/Student Activities</td><td colspan="3">

Warm UPs
Homework Displays
Direct Instruction
Guided Practice
Cooperative Learning (Group Work)
Modeling
Think-Pair-Share (Buddy System)
Graphing Templates

</td></tr>
</table>

	● Exit Tickets ● Standardized Test Practice			
Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
	● Manipulatives ● Oral Directions (repeat when necessary) ● Preferred Seating ● Calculator ● Pictures/Graphics ● Flash Card Wall ● "Classroom Buddy" ● Key terms highlighted ● Provide Examples/Show Work ● Immediate Feedback ● Assessment Retake (one per marking period)	● Flash Card Wall ● Oral Directions (repeat when necessary) ● Preferred Seating ● Calculator ● Key Terms Highlighted ● Pictures/Graphics ● Manipulatives ● Notebook of Key Terms ● Additional Time ● Assessment retake (one per marking	● Provide Extra Time ● Manipulatives ● Pictures/Graphics ● Provide Examples/Show Work ● Chunk long-term assignments ● Assessment Retake (one per marking period)	● Tiered Assignments ● Flexible Grouping ● Independent Study

		period) • Provide Examples/S how Work		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process) • Interactive Notebook/note-taking sheet • Bi-Weekly Progress Reports • Desmos Activities		**Expression** (Products and/or Performance) • Quizzes and Tests • Derivation of Quadratic Formula • SAT Worksheet	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier 2: graph, function, coordinate, table, simplify, solve, domain, range, exponential function, inverse, inverse function, exponential decay, exponential growth, Tier 3: logarithm, logarithmic function, common logarithm, natural logarithm, decay factor, growth factor, natural base e, exponential equation, logarithmic equation, asymptote, logarithm of y with base b			
Integration of Technology SAMR	S: Use graphing calculator to add, subtract, multiply and divide quickly. A: Use graphing calculator to locate vertex and graph quadratic functions. M: Desmos Activities - Graphing Exponential Functions, Surprise: Product Property of Logarithms S, A and M: Khan Academy or iXL remediation			
Interdisciplinary Connections NJ Student Learning Standards	Technology: NJSLS.8.2.12.B.2 Career Ready Practices: CRP3 CRP5 Financial Literacy: 9.1.12.A.9 9.1.12.B.2			

<table>
<tr><td></td><td colspan="2">9.1.12.B.8

Interdisciplinary:
ELA: NJSLSA.R4
SCIENCE: NJSLS-S.HS-PS1-C
SCIENCE: NJSLS-S.HS-ESS1-6

Career Exploration:
NJSLS.9.3.ST.2</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td>Global Awareness

Financial, Economic, Business and Entrepreneurial Literacy

Health Literacy

Environmental Literacy</td><td>Critical Thinking and Problem Solving
Communication and Collaboration
Information, Communications, and Technology Literacy
Productivity & Accountability
Leadership & Responsibility
Flexibility & Adaptability
Social and Cross Cultural Skills
Initiative & Self Direction</td></tr>
<tr><td>Resources/Materials</td><td colspan="2">Resources:
iXL
Larson (2012) Algebra II Textbook
Larson Assessment Book
Khan Academy
Desmos.com
Teacher-generated worksheets
Standardized test worksheets</td></tr>
</table>

	Materials: Chromebooks Malipulatives Flash Cards Patty Paper Colored Pencils Parent Functions

Instructional Unit Map				
Course Title: Algebra II Honors				
Unit Title	Unit 5: Rational Functions		**Start Date:**	December/May
			Length of Unit:	11 days
Content Standards *What do we want them to know, understand, & do?*	NJSLS.A.APR.D.7 NJSLS.A.REI.A.2 NJSLS.F.IF.C.7.d MP.1 MP.4 MP.6	**Learning Goals**	The students will be able to rewrite rational expressions and perform basic operations on them. (4 days) The students will be able to solve simple radical and rational equations in one variable, and give examples showing how extraneous solutions may arise. (2 days) The students will be able to identify zeros and asymptotes of rational functions. (4 days)	

<table>
<tr><td></td><td colspan="3"></td><td>The students will be able to calculate and interpret the average rate of change of a function over a specified interval. (1 days)</td></tr>
<tr><td>Essential Questions</td><td colspan="4">● How are graphs of rational functions similar to and different from polynomial, radical, exponential, and logarithmic functions?
● How does one add, subtract, multiply and divide rational expressions?
● How are rational functions used to represent real-life situations?
● How are rational equations solved?</td></tr>
<tr><td rowspan="2">Assessments
How will we know they have gained the knowledge & skills?</td><td colspan="2">Formative</td><td>Summative</td><td>Alternative</td></tr>
<tr><td colspan="2">● Warm UPs/Exit Tickets
● Choral and individual responses to questioning verbally and on the SmartBoard
● Thumbs up/down, indicators, and other interactive answering strategies
● Graded homework
● Guided Questions</td><td>● Quizzes
● End of Chapter Tests
● Extended Constructed Response Questions
● Projects</td><td>● Chapter 5 Alternative Assessment and Math Journal</td></tr>
<tr><td>Unit Pre-Assessment(s)
What do they already know?</td><td colspan="4">Standardized TEST PRACTICE: MULTIPLE CHOICE pg 374-375 #1-8 all, 9-17 odd.</td></tr>
<tr><td>Instructional Strategies/Student Activities</td><td colspan="4">● Warm UPs
● Homework Displays</td></tr>
</table>

	• Direct Instruction • Guided Practice • Cooperative Learning (Group Work) • Modeling • Think-Pair-Share (Buddy System) • Exit Tickets • Standardized Test Practice			
Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
	• Manipulatives • Oral Directions (repeat when necessary) • Preferred Seating • Calculator • Pictures/Graphics • Flash Card Wall • "Classroom Buddy" • Key terms highlighted • Provide Examples/Show Work • Immediate Feedback • Assessment	• Flash Card Wall • Oral Directions (repeat when necessary) • Preferred Seating • Calculator • Key Terms Highlighted • Pictures/Graphics • Manipulatives • Notebook of Key Terms	• Provide Extra Time • Manipulatives • Pictures/Graphics • Provide Examples/Show Work • Chunk long-term assignments • Assessment Retake (one per marking period)	• Tiered Assignments • Flexible Grouping • Independent Study

	Retake (one per marking period)	• Additional Time • Assessment retake (one per marking period) • Provide Examples/S how Work		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process) • Interactive Notebook/note-taking sheet • Bi-Weekly Progress Reports • Desmos Activities		**Expression** (Products and/or Performance) • Career Project • Quizzes and Tests • Derivation of Quadratic Formula • SAT Worksheet	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier 2: graph, function, coordinate, table, simplify, solve, domain, range, direct variation, inverse variation, increasing, decreasing, cross multiplying, fraction, proportion, asymptote Tier 3: joint variation, even function, odd function, complex fraction, simplified form of a rational expression			
Integration of Technology SAMR	S: Use graphing calculator to add, subtract, multiply and divide quickly. A: Use graphing calculator to locate vertex and graph quadratic functions. M: Desmos Activities - What's Rational?, Exploring Rational Functions S, A and M: Khan Academy or iXL remediation			
Interdisciplinary Connections NJ Student Learning Standards	Technology: NJSLS.8.2.12.E.4 Career Ready Practices: CRP.2			

<table>
<tr><td></td><td colspan="2">Interdisciplinary:
ELA: NJSLSA.R7

Career Exploration:
NJSLS.9.3.ST-SM.1</td></tr>
<tr><td rowspan="2">21st Century Themes/Skills
P21 Framework</td><td>Themes</td><td>Skills</td></tr>
<tr><td>Global Awareness

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Health Literacy

Environmental Literacy</td><td>Creativity and Innovation
Critical Thinking and Problem Solving
Communication and Collaboration
Information Literacy
Media Literacy
Information, Communications, and Technology Literacy
Productivity & Accountability
Leadership & Responsibility
Flexibility & Adaptability
Social and Cross Cultural Skills
Initiative & Self Direction</td></tr>
<tr><td>Resources/Materials</td><td colspan="2">Resources:
iXL
Larson (2012) Algebra II Textbook
Larson Assessment Book
Khan Academy
Desmos.com
Teacher-generated worksheets
Standardized test worksheets

Materials:
Chromebooks</td></tr>
</table>

	Malipulatives Flash Cards Poster Board

Instructional Unit Map				
Course Title: Algebra II Honors				
Unit Title	Unit 7: Sequences and Series		**Start Date:**	January/June
			Length of Unit:	11 days
Content Standards *What do we want them to know, understand, & do?*	NJSLS.A.SSE.B.4 NJSLS.F.BF.A.1 NJSLS.F.BF.A.2 NJSLS.HS-M MP.2 MP.3 MP.4 MP.6 MP.7 MP.8	**Learning Goals**	The students will be able to derive the formula for the sum of a finite geometric series (when the common ratio is not one) and use the formula to solve problems. (6 days) The students will be able to write arithmetic and geometric sequences both recursively and with and explicit formula, and use them to model situations, and translate between the two forms. (5 days)	
Essential Questions	• How can recursive rules be used to write a rule for a pattern? • How can patterns be analyzed to determine the next term and a rule to generate the pattern? • How are sequences and series used to represent real-life situations?			

<table>
<tr><td rowspan="2">Assessments
How will we know they have gained the knowledge & skills?</td><td>Formative</td><td>Summative</td><td>Alternative</td></tr>
<tr><td>Warm UPs/Exit Tickets
Choral and individual responses to questioning verbally and on the SmartBoard
Thumbs up/down, indicators, and other interactive answering strategies
Graded homework
Guided Questions</td><td>Quizzes
End of Chapter Tests
Extended Constructed Response Questions
Projects</td><td>Chapter 7 Alternative Assessment and Math Journal</td></tr>
<tr><td>Unit Pre-Assessment(s)
What do they already know?</td><td colspan="3">Standardized TEST PRACTICE: MULTIPLE CHOICE pg 486-487 #1-6 all, 8-20 even.</td></tr>
<tr><td>Instructional Strategies/Student Activities</td><td colspan="3">Warm UPs
Homework Displays
Direct Instruction
Guided Practice
Cooperative Learning (Group Work)
Modeling
Think-Pair-Share (Buddy System)
Exit Tickets
Standardized Test Practice</td></tr>
</table>

Instructional/Assessment Scaffolds *(Modifications /Accommodations) – planned for prior to instruction*	**English Language Learners**	**Special Education Learners**	**Struggling Learners**	**Advanced Learners**
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		how Work		
Differentiated Instructional Methods: *(Multiple means for students to access content and multiple modes for student to express understanding)*	**Access** (Resources and/or Process)		**Expression** (Products and/or Performance)	
	• Interactive Notebook/note-taking sheet • Bi-Weekly Progress Reports • Desmos Activities		• Quizzes and Tests • Derivation of Quadratic Formula • SAT Worksheet	
Vocabulary *Highlight key vocabulary (both Tier II and Tier III words)*	Tier 2: domain, range, terms of a sequence, linear function, quadratic function, exponential function, finite, infinite, common difference, common ratio, iteration, function composition, solve, table Tier 3: sequence, series, first difference, second difference, summation notation, sigma notation, arithmetic sequence, geometric sequence, arithmetic series, geometric series, recursive rule, recursion, partial sum, Fibonacci sequence			
Integration of Technology SAMR	S: Use graphing calculator to add, subtract, multiply and divide quickly. A: Use graphing calculator to locate vertex and graph quadratic functions. M: Desmos Activities - Expressing Number Patterns; Arithmetic, Geometric or Neither; Polygraph: Sequences; Sequences Card Sort S, A and M: Khan Academy or iXL remediation			
Interdisciplinary Connections NJ Student Learning Standards	Technology: NJSLS.8.2.12.E.4 Career Ready Practices: CRP4 CRP8 Interdisciplinary: ELA: NJSLSA.W.1 Career Exploration: NJSLS.9.3.ST-SM.1			

21st Century Themes/Skills P21 Framework	Themes	Skills
	Financial, Economic, Business and Entrepreneurial Literacy Environmental Literacy	Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information, Communications, and Technology Literacy Productivity & Accountability Leadership & Responsibility Flexibility & Adaptability Social and Cross Cultural Skills Initiative & Self Direction
Resources/Materials	Resources: iXL Larson (2012) Algebra II Textbook Larson Assessment Book Khan Academy Desmos.com Teacher-generated worksheets Standardized test worksheets Materials: Chromebooks Malipulatives Flash Cards	