CITY OF BURLINGTON PUBLIC SCHOOL DISTRICT CURRICULUM

Algebra 1 Honors

Revision Date: __7/14/17_____

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Course Overview

In this course, students will formalize and extend the mathematics that they learned in the middle grades. The units deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend. Students engage in methods for analyzing, solving, and using quadratic functions. The Mathematical Practice Standards apply throughout the course and, together with the New Jersey Student Learning Standards (NJSLS), students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

The New Jersey Student Learning Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.

The curriculum guide has been generated to not only help students achieve the New Jersey Student Learning Standards, but to ensure that students will be prepared for college and career opportunities following high school graduation.

Primary Resource(s)

> **Textbook**

- Title: Algebra 1 Common Core

    Publisher: Pearson Education Inc.   Copyright: 2012

Supplemental Materials (including various level of texts at each grade level)

- **Title: NJ Center for Teaching and Learning:** Worksheets, Activities, and Assessments
    www.njctl.org
- **Title: Math Worksheets Land**
    www.mathworksheetsland.com
- **Title: Inside Mathematics - Common Core Resources**

http://www.insidemathematics.org/performance-assessment-tasks
- **Title: Mathematics Assessment Project – Mathematics Assessment Resource Services**
  http://map.mathshell.org/tasks.php?unit=HN03&collection=9
- **Title: Illustrative Mathematics - Content Specific Mathematics Tasks**
  https://www.illustrativemathematics.org/content-standards/HSS/ID/A/1/tasks/102

Pacing Chart

Unit # & Title	Pacing (must equal 165 days for full-year or 83 days for half-year course)
Unit 1 – Modeling with Linear Equations and Inequalities	20 days
Unit 2 – Modeling with Linear Functions, Linear Systems, & Exponential Functions	25 days
Unit 3 – Quadratic Equations, Functions, & Polynomials	60 days
Unit 4 – Modeling with Statistics	15 days
Unit 5 – Introduction to Trigonometry	45 days

Unit 1: Modeling with Linear Equations and Inequalities
Overview At-a-Glance

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Unit #1 – Modeling with Linear Equations and Inequalities

Unit Description:
In this unit, students will focus on conceptual understanding of linear equations and inequalities, graphing linear equations and inequalities, applying linear equations and inequalities to real life situations, and interpreting linear graphical results.

Essential Skills:
- Reason quantitatively and use units to solve problems
- Solve [linear] equations and inequalities in one variable
- Understand solving equations as a process of reasoning and explain the reasoning
- Create equations that describe numbers or relationships
- Interpret the structure of expressions
- Represent and solve equations graphically
- Summarize, represent, and interpret data on quantitative variables
- Interpret linear models

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Standards Addressed within this Unit			
Central Unit Standards- This unit will focus primarily on learning goals aligned with the following standards:	**Supporting Unit Standards-** This unit will also include activities aligned with the following standards:		

Central Unit Standards		Math Standards	NGSS Standards	ELA Standards
• N.Q.A.1	• A.REI.A.11	• 8.EE.B.5	• HS.PS2.A	• RST.11-12.1
• N.Q.A.2	• A.CED.A.2	• 8.EE.B.6	• HS.PS2.B	• SL.11-12.5
• N.Q.A.3	• A.REI.D.10	• 8.EE.C.7a	• HS.ETS1.A	• WHST.11-12.7
• A.REI.B.3	• S.ID.B.6	• 8.EE.C.7b	• HS.ETS1.C	• WHST.11-12.8
• A.REI.A.1	• S.ID.C.7	• 8.EE.C.8a		• WHST.11-12.9
• A.CED.A.4	• S.ID.C.8	• 8.EE.C.8b		
• A.SSE.A.1	• S.ID.C.9	• 8.EE.C.8c		
• A.CED.A.1		• 8.SP.A.3		
		• 8.F.B.4		

Unit Details	
Modifications for Special Education Students, English Language Learners, Students at Risk of Failure, and Gifted Students- Modify instructional approach and/or assignments and evaluations as needed based for students with IEPs, 504s, ELLs and gifted and talented students including but not limited to: • Alternate responses (drawings with captions, spoken responses, etc.) • Advance/guided notes • Extended time • Teacher modeling (non-verbal teacher communication in addition to spoken instructions) • Simplified written and verbal instructions • ELL support materials (eDictionaries, native language prompts, etc.) • Increased integration of higher order thinking processes, creative and critical thinking activities, problem-solving, and open-ended tasks • Advanced pacing levels • Greater opportunities for freedom of choice and independent study that encourage independent and intrinsic learning • CSI projects to integrate higher-order thinking skills and creativity • Create portfolios and peer lessons • Reteaching worksheets • Graphic organizers • Visual Vocabulary • Hands-on activity labs and modeling activities using tangrams • Graph paper to produce visual representations of transformations • Enrichment activities and worksheets	**Integration of 21st century skills through NJSLS 10 and Career Education:** • Lessons, activities, and assessments require creativity and innovation on the part of the students. They are required to create projects and products as examples of mastery in each unit. • Critical thinking and problem-solving skills are a core component of learning and assessment throughout this curriculum. Students are required, in each unit, to advance their learning through all levels of Bloom's Taxonomy to address the evaluation, synthesis, and creation of products using learning at the highest levels. Problem-solving is a recurring theme in the curriculum as students must seek ways to creatively apply the concepts to solve problems rather than simply remember the material. • Learning advocates for health literacy as a critical component of a healthy lifestyle and the ability to make good health-related decisions. • Students explore areas that support environmental literacy, including society's impact on the environment and what can be done to support environmental solutions. • Lessons, where appropriate, incorporate multiple perspectives to infuse cultural and global awareness. • Students must be information literate, i.e. they must be able to find and use information effectively, in order to succeed in class as learning activities require independent research of relevant information outside of the provided textbook and/or resources.

Assessments- including benchmarks, formative, summative, and alternative assessments	Suggested Interdisciplinary Activities for this Unit
Formative • Fluency Practice Activities • Pearson Lesson Quizzes • Topic Readiness Assessment • Mid-Topic Assessment • Mid-Topic Performance Task • (ExamView®) Lesson and Checkpoint Quizzes • PMI Quizzes **Summative** • STEM Project • Topic Assessment • Topic Performance Task	**Career Education –** Create a budget; track and distribute assets and debits **Health/PE –** Capture/recapture sampling method; BMI/Heart rate calculations; Compare and select a Health Club Membership **English Language Arts & Literacy –** According to one count, the letter e makes up 1/8 of a typical document written in English. A document contains 2800 letters. About how many letters in the document are NOT e? **Art –** Golden ratio and golden rectangle; Introduction of such and the major effect on artistic representation (Renaissance) **Science –** Create a project on the algebra behind the original method of determining our distance away from the sun. **History/Social Studies –** Calculate the distribution of House of Representatives based on population distributions **Technology –** You format a document .t in three columns of equal width. The document is 8.5 in wide. You want left and right margins of 1 in each. Between the columns there is a "gutter" that is 1/8 as wide as each column. What is the width of each column? **World Languages –** Using the results of LAL, what is the fraction of letters in another language that are vowels? What is the most occurring letter in languages other than English?

Unit Resources
Teachers should utilize school resources available in our Media Center to infuse alternate sources, perspectives, and approaches. Resources should include textual support but also span multimedia options to engage multiple modalities. In addition, to support struggling readers and increase rigor for advanced readers, the coursework may also draw on additional developmentally appropriate resources to facilitate challenging levels of work for all students.

Leveled Supplemental Materials and Media/School Library Resources	**Integration of the Technology Standard**
• Various leveled texts available via text, supplemental text, such as guided notes handouts, additional practice handouts, concept review handouts, sample/alternate tests • Additional supplemental resources: Learnzillion, Khan Academy, Math TV, BetterLesson, Kuta Software, Math Worksheets Land, • Informational Text resources from EdHelper, Scholastic Math • Digital Resources: NJSLS Stations, CSI Math Projects, and NJSLS Mathematics Warm-ups.	• 8.1.12.A.1 • 8.1.12.A.2 • Microsoft Office: Word, Excel, PowerPoint • Google Docs/Sheets/Slides- Student will create a slideshow or presentation that talks about fields that utilize algebra as per the technology standards. • Graphing Calculators/Online graphing tools • www.PowerAlgebra.com- Students will utilize this website to access their textbook or addition practice. • http://parcc-assessment.org/ - Students will utilize this website to take sample PARCC exams

Unit 1: Modeling with Linear Equations and Inequalities
Targeted Instructional Planning to Address Central Unit Standards:

Central Unit Standard and Student Learning Objective	Suggested Instructional Activities	Suggested Student Output	Formative Assessments (Portfolios, Projects, Tasks, Evaluations, & Rubrics)
N.Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. **N.Q.A.2** Define appropriate quantities for the purpose of descriptive modeling. **N.Q.A.3** Choose a level of accuracy appropriate to limitations on	**Illustrative Math Topics** N.Q.A.1 Runners' World Calculate the volume of water in the average 160 pound runner. N.Q.A.2 Giving Raises Determine how to give raises to five different employees by considering different variables. N.Q.A.3 Calories in a Sports Drink Calculate calories in a sports drink by using a proportional data about the product. Diagnostic assessment focusing on the standards from eighth grade to check for readiness of the entire unit. Guided Instruction on creating formulas from written information. Pearson Active Math Exploration interactive computer models to give a hands on experience with data Pearson Video tutorials for extra help or re-teaching	Journal entries written about the usage of data in the real world and how to represent data in algebra. Open-ended responses to real world problems talking about data and measurement. Student-led discussion of key points of measurement. Presentations using technology on physical fitness and the measurement of related formulas. Collected Homework Notebook Checks	**Formative** Fluency Practice Activities Pearson Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Mid-Topic Performance Task (ExamView®) Lesson and Checkpoint Quizzes PMI Quizzes

measurement when reporting quantities.	Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions based on real world data.		PowerAlgebra self-check **Summative**
A.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **A.REI.A.1** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. **A.CED.A.4** Rearrange formulas to highlight a quantity of	**Illustrative Math Topics** A.REI.B.3, A.REI.A.1 Reasoning with linear inequalities Find the mathematical errors in an algebraic proof of a linear inequality A.CED.A.4 Equations and Formulas Use the inverse property to solve a group of literal equations found throughout other content areas A.REI.A.1 Zero Product Property 1 Solve and explain for several equations involving zero by using the zero product property. Interactive Notebook for solving literal equations. Pictures can include the method, different stages of literal equations, or any visual representation of the process. Guided Instruction on solving linear equations and literal equations. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about the usage of linear equations in the real world. Open-ended responses to questions involving the usage of linear equations for real world data. Student-led discussion of key points of linear equations and their transformations. Presentations using technology for a children's storybook. Collected Homework Notebook Checks	STEM Project Topic Assessment Topic Performance Task **Projects** Your good health and physical fitness will enhance your quality of life. As students work through this project, they will use formulas related to physical fitness and health. They will work with equations and inequalities that allow for differences in weight, height,

interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R.	Informational Text and responses to comprehension questions based on uses for literal equations		and age. Finally, students will design an exercise plan. Children's storybook: Students will choose one of the major topics discussed in this unit and design a children's storybook explaining this topic to young children. Topics could include: how to graph linear functions, comparing functions, etc. In addition to teaching a mathematical lesson, the book should teach a life lesson appropriate to the young age level targeted.

Fantasy Football: Students create their own fantasy |
| **A.SSE.A.1** Interpret expressions that represent a quantity in terms of its context.

A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear functions and quadratic functions, and simple rational and exponential functions. | **Illustrative Math Topics** A.SSE.A.1 Kitchen Floor Tiles Explain the reasoning of another person's answers by using algebra to expand upon a pattern.

A.CED.A.1 Planes and wheat Solve one variable equations by substituting in numeric values to an existing equation.

A-CED.A.1 Paying the rent Turn a real world problem about rent into an equation, a table and a graph.

Interactive Notebook for solving inequalities. The images created can be centered on the shading process, the different ways of shading, or the reason for shading.

Guided Instruction on solving linear inequalities.

Pearson Video tutorials for extra help or re-teaching

Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation.

PARCC Sample Questions found on the PARCC website. | Notebooks will have notes on one side of the page and visual representations of the material on the other.

Journal entries written about the usage of linear inequalities in the real world.

Open-ended responses to questions involving the usage of linear inequalities for real world data.

Student-led discussion of key points of linear inequalities and shading.

Presentations using technology about fantasy football.

Collected Homework

Notebook Checks | |

			football system in which they must determine and evaluate appropriate expressions for touchdowns, extra points, yards gained, lost, etc.
	Informational Text and responses to comprehension questions based on linear inequalities		
A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; Graph equations on coordinate axes with labels and scales. **A.REI.D.10** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). [Focus on linear equations.]	**Illustrative Math Topics** A.CED.A.2 Clea on an Escalator Compare two different rates to find a rate between the two. Interactive Notebook for graphing equations. The images should depict the different aspects of a graph. Guided Instruction on graphing equations and how to utilize tables. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of graphs	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to create graphs and the relationship between the variables and the axes. Open-ended responses to questions involving graphing and its relationship to multiple unknowns Student-led discussion of key points of graphing. Collected Homework Notebook Checks	
S.ID.B.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. **S.ID.C.7**	**Illustrative Math Topics** S.ID.B.6,S.ID.C.7-9 Coffee and Crime Analyze a scatter plot to answer a group of questions about a counties shop and crime rate. Interactive Notebook for using scatter plots. Images will be created about the different parts of a scatter plot, the usage of a scatter plot, or how to create a scatter plot.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to create scatter plots and what purpose they have in the real world.	

Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. **S.ID.C.8** Compute (using technology) and interpret the correlation coefficient of a linear fit. **S.ID.C.9** Distinguish between correlation and causation.	Guided Instruction on how to create a scatter plot and the different parts of a scatter plot. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of scatter plots.	Open-ended responses to questions involving scatter plots and how to compute them using technology. Student-led discussion of key points of scatter plots. Technology based presentation about the different fields that utilize algebra. The presentation should utilize google docs or slides. Collected Homework Notebook Checks	

Unit 2: Modeling with Linear Functions, Linear Systems, & Exponential Functions Overview At-a-Glance

Unit #2 – Modeling with Linear Functions, Linear Systems, & Exponential Functions
Unit Description: This unit focuses on expanding students' understanding of linear functions, solving linear systems, using linear systems to solve real work problems, graphing exponential functions, and recognizing the difference between different types of functions graphically and in table form.
Essential Skills: • Solve linear systems of equations • Create equations that describe numbers or relationships • Interpret the structure of expressions • Represent and solve equations and inequalities graphically • Construct and compare linear & exponential models • Interpret expressions for functions in terms of the situation • Build a function that models a relationship between two quantities • Understand the concept of a function and use function notation • Interpret functions that arise in applications in terms of the context • Analyze functions using different representations

Standards Addressed within this Unit			
Central Unit Standards- This unit will focus primarily on learning goals aligned with the following standards:	**Supporting Unit Standards-** This unit will also include activities aligned with the following standards:		
• A.REI.C.6 ● F.BF.A.1 • A.CED.A.3 ● A.SSE.A.1 • A.REI.C.5 ● A.SSE.B.3 • A.REI.D.12 ● F.IF.B.4 • F.IF.A.1 ● F.LE.B.5 • F.IF.A.2 ● F.IF.B.5 • F.LE.A.1 ● F.IF.B.6 • F.LE.A.2 ● F.IF.C.9 • F.IF.A.3 ● F.IF.C.7	**Math Standards** • 8.EE.C.8a • 8.EE.C.8b • 8.EE.C.8c • 8.SP.A.3 • 8.F.B.4	**NGSS Standards** • HS.LS4.A • HS.LS4.B • HS.LS4.C	**ELA Standards** • RST.11-12.1 • RST.11-12.8 • SL.11-12.4 • WHST.11-12.9 • WHST.9-12.2

Unit Details

Modifications for Special Education Students, English Language Learners, Students at Risk of Failure, and Gifted Students-	Integration of 21st century skills through NJSLS 10 and Career Education:
Modify instructional approach and/or assignments and evaluations as needed based for students with IEPs, 504s, ELLs and gifted and talented students including but not limited to: • Alternate responses (drawings with captions, spoken responses, etc.) • Advance/guided notes • Extended time • Teacher modeling (non-verbal teacher communication in addition to spoken instructions) • Simplified written and verbal instructions • ELL support materials (eDictionaries, native prompts, etc.) • Increased integration of higher order thinking processes, creative and critical thinking activities, problem-solving, and open-ended tasks • Greater opportunities for freedom of choice and independent study that encourage independent and intrinsic learning • CSI projects to integrate higher-order thinking skills and creativity • Create portfolios and peer lessons • Reteaching worksheets • Graphic organizers • Visual Vocabulary • Hands-on activity labs and modeling activities using tangrams • Graph paper to produce visual representations of transformations • Enrichment activities and worksheets	• Lessons, activities, and assessments require creativity and innovation on the part of the students. They are required to create projects and products as examples of mastery in each unit. • Critical thinking and problem-solving skills are a core component of learning and assessment throughout this curriculum. Students are required, in each unit, to advance their learning through all levels of Bloom's Taxonomy to address the evaluation, synthesis, and creation of products using learning at the highest levels. Problem-solving is a recurring theme in the curriculum as students must seek ways to creatively apply the concepts to solve problems rather than simply remember the material. • Lessons, where appropriate, incorporate multiple perspectives to infuse cultural and global awareness. • Learning and assessment activities support the push to make students media literate, as they are often required to analyze, evaluate, and create messages in a wide variety of media modes, genres, and formats. • In order to succeed in this course, students must be able to use technology as a tool in order to research, organize, evaluate, and communicate information. • Activities in the curriculum help develop life and career skills in all students by promoting flexibility and adaptability, requiring initiative and self-direction in the learning process, supporting social and cross-cultural skills in both content and teamwork efforts, and

	measuring productivity and accountability through independent and group assignment completion.
Assessments- including benchmarks, formative, summative, and alternative assessments **Formative** • Fluency Practice Activities • Envision Lesson Quizzes • Topic Readiness Assessment • Mid-Topic Assessment • Mid-Topic Performance Task • (ExamView®) Lesson and Checkpoint Quizzes • PMI Quizzes • PowerAlgebra quizzes **Summative** • STEM Project • Topic Assessment • Topic Performance Task • Unit 1-2 Cumulative/Benchmark Assessment	**Suggested Interdisciplinary Activities for this Unit** **Career Education –** Cost of building a house within a budget. Balance out needs and wants. **Health/PE -** At a local fitness center, members pay a $20 membership fee and $3 for each aerobics class. Nonmembers pay $5 for each aerobics class. For what number of aerobic classes will the cost for members and nonmembers be the same? **English Language Arts & Literacy –** Are row operations more like the substitution method or the elimination method? Explain. **Art –** Create a project using systems of inequalities. The shaded regions of the graphs should be able to be put together to create a picture. **Science –** A farmer grows corn, tomatoes, and sunflowers on a 320-acre farm. This year, the farmer wants to plant twice as many acres of tomatoes as acres of sunflowers. The farmer also wants to plant 40 more acres of corn than of tomatoes. How many acres of each crop should the farmer plant? **History/Social Studies –** Compare capitalism and communism by using a system of equations that represent the gross national products of each country. **Technology –** A bike store costs $2400 per month to rent. The store pays $60 per bike and sells for $120. How many bikes must be sold to breakeven? Express as a spreadsheet. What other fixed costs and variable costs should also be included?

	World Language – How can the substitution method be utilized when changing an English sentence to [insert language here]? What limitations does this method have? Explain.

Unit Resources
Teachers should utilize school resources available in our Media Center to infuse alternate sources, perspectives, and approaches. Resources should include textual support but also span multimedia options to engage multiple modalities. In addition, to support struggling readers and increase rigor for advanced readers, the coursework may also draw on additional developmentally appropriate resources to facilitate challenging levels of work for all students.

Leveled Supplemental Materials and Media/School Library Resources	**Integration of the Technology Standard**
- Various leveled texts available via text, supplemental text, such as guided notes handouts, additional practice handouts, concept review handouts, sample/alternate tests - Additional supplemental resources: Learnzillion, Khan Academy, Math TV, BetterLesson, Kuta Software, Math Worksheets Land, - Informational Text resources from EdHelper, Scholastic Math - Digital Resources: NJSLS/CC Stations, CSI Math Projects, and NJSLS/CCSS Mathematics Warm-ups.	8.1.12.A.4 8.1.12.B.2 • Microsoft Office: Word, Excel, PowerPoint • Google Docs/Sheets/Slides- Student will create a game utilizing google sheets. The students should use Sheets are a data gathering tool, score calculator, or other resource for their game. • Graphing Calculators/Online graphing tools • www.PowerAlgebra.com- Students will utilize this website to access their textbook or addition practice. http://parcc-assessment.org/ - Students will utilize this website to take sample PARCC exams

Unit 2: Modeling with Linear Functions, Linear Systems, & Exponential Functions
Targeted Instructional Planning to Address Central Unit Standards:

Central Unit Standard and Student Learning Objective	Suggested Instructional Activities	Suggested Student Output	Formative Assessments (Portfolios, Projects, Tasks, Evaluations, & Rubrics)
A.REI.C.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. **A.REI.C.6** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. **A.REI.D.12** Graph the solutions to a linear inequality in two variables as a half-plane (excluding the	**Illustrative Math Topics** A.REI.C.6 Cash Box Determine whether an amount of cash is possible given price of tickets by using a linear inequality. A.CED.A.3 Dimes and Quarters Determine the amount of quarters and dimes by graphing a system of linear equations. A.REI.C.5 Solving Two Equations in Two Unknowns Think about the solutions to a system of linear equations and determine why all methods will give you the same result. A.REI.D.12 Fishing Adventures 3 Use linear inequalities to find the feasible values of people and weight that can get into a boat safely. Diagnostic assessment focusing on the standards from eighth grade and the previous unit to check for readiness of the entire unit.	Journal entries written about the usage of systems of linear equations in the real world. Open-ended responses to real world problems involving systems of linear equations. Student-led discussion of the different methods of solving systems of linear equations. Presentations using technology for a student council dinner. Students will be given different variables to consider and they will solve a system of linear equations to determine the course of action that should be followed. Collected Homework Notebook Checks	**Formative** Fluency Practice Activities Pearson Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Mid-Topic Performance Task (ExamView®) Lesson and Checkpoint Quizzes PMI Quizzes PowerAlgebra self-check **Summative**

boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. **A.CED.A.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	Guided Instruction on creating formulas from written information. Pearson Active Math Exploration interactive computer models to give a hands on experience with inequalities Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions based on real world problems involving inequalities.		STEM Project Topic Assessment Topic Performance Task Unit 1-2 Cumulative/Benchmark Assessment **Project** Suppose you are the student council member that is responsible for planning a student dinner dance. Plans include hiring a band and buying and serving dinner. You want to keep the ticket price as low as possible to encourage student attendance. As you work through the following activities, you will use systems of equations to analyze costs and make decisions. You will write a report detailing
F.IF.A.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a	**Illustrative Math Topics** F.IF.A.1 The Parking Lot Complete a table and use a compound inequality to explain the pricing of a parking lot. F.IF.A.2 Yam in the Oven Use functions notation to describe real life situations, such as, the temperature of yams in the oven.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to set up functions and what purpose they have in the real world.	

function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). **F.IF.A.2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Interactive Notebook for functions. The images should focus on function notation, the usage of functions, and/or how to create functions. Guided Instruction on how to set up a function and what each part of function notation means. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of functions.	Open-ended responses to questions involving functions and how to enter them into technology. Student-led discussion of key points of functions. Technology based presentation about the length of time to say tongue twisters. This data will be recorded and presented using the google slides. Collected Homework Notebook Checks	your choice of band, the cost of a catering service, and your ticket price recommendation. Multimedia Presentations: Upon completing the unit on exponents, students will create a multimedia presentation explaining the major concepts in a highly visual and interesting manner. As students work through the activities of this project they will time people as they say tongue twisters. They will use graphs to help investigate and display relationships in the data they collect. Then, using functions, they will summarize their findings and make predictions.
F.LE.A.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. **F.LE.A.2** Construct linear and exponential functions - including arithmetic and geometric	**Illustrative Math Topics** F.LE.A.1 Finding Linear and Exponential Models Create linear and exponential models from descriptions of real life events. F.LE.A.2 Interesting Interest Rates Use the compound interest formula to find the difference between simple interest and compound interest. Interactive Notebook for exponential functions. Images represented should focus on the structure	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to set up exponential functions and what purpose they have in the real world. Open-ended responses to questions involving	

sequences - given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). *[Algebra 1 limitation: exponential expressions with integer exponents]* **F.IF.A.3** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.*	differences between linear and exponential functions, the graphs of exponential functions, or the procedure for solving exponential functions. Guided Instruction on how to set up an exponential function and what each part of an exponential function means. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of exponential functions.	exponential functions and how to enter them into technology. Student-led discussion of key points of exponential functions. Technology based presentation about the comparison of compound interest. The students will determine the reason that compound interest is superior to simple interest. Collected Homework Notebook Checks	**Formative** Fluency Practice Activities Pearson Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Mid-Topic Performance Task (ExamView®) Lesson and Checkpoint Quizzes PMI Quizzes
F.BF.A.1 Write a function that describes a relationship between two quantities. **A.SSE.A.1** Interpret expressions that represent a quantity in terms of its context **A.SSE.B.3**	**Illustrative Math Topics** F.BF.A.1a Skeleton Tower Find the number of cubes needed to create a given structure, then extrapolate the amount of squares for larger structures. A.SSE.A.1 Mixing Candies Determine the value of candies in a given box by creating and solving a system of linear equations.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to set up functions and what purpose they have in the real world. Open-ended responses to questions involving functions	PowerAlgebra self-check **Summative** STEM Project Topic Assessment Topic Performance Task Unit 1-2

Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	Interactive Notebook for functions. The images should focus on function notation, the usage of functions, and/or how to create functions. Guided Instruction on how to set up a function from a model. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the setup of functions from models.	and how to enter them into technology. Student-led discussion of key points of setting up functions. Technology based presentation based around a game they created. The students will need to use google sheets as part of their game creation. Collected Homework Notebook Checks	Cumulative/Benchmark Assessment **Project** Suppose you are the student council member that is responsible for planning a student dinner dance. Plans include hiring a band and buying and serving dinner. You want to keep the ticket price as low as possible to encourage student attendance. As you work through the following activities, you will use systems of equations to analyze costs and make decisions. You will write a report detailing your choice of band, the cost of a catering service, and your ticket price recommendation. Multimedia Presentations: Upon
F.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is*	**Illustrative Math Topics** F.IF.B.4 Warming and Cooling Use a graph of heat over time to determine the solution to several different equations. F.IF.B.4, F.IF.B.5 Average Cost Use an equation, table, and graph to determine the amount of money that should be paid for different numbers of DVDs.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to solve for the domain and range of an exponential function. Open-ended responses to questions involving the limitations of the domain and	

increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. *[Focus on exponential functions] **F.LE.B.5** Interpret the parameters in a linear or exponential function in terms of a context. **F.IF.B.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function*	Interactive Notebook for domain and range of exponential functions. The images should focus on domain, range, or the limitations places on the domain and/or range. Guided Instruction on how to solve for the domain and range of an exponential function. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the domain and range of exponential functions.	range of an exponential function. Student-led discussion of key points of domain and range. Collected Homework Notebook Checks	completing the unit on exponents, students will create a multimedia presentation explaining the major concepts in a highly visual and interesting manner. As students work through the activities of this project they will time people as they say tongue twisters. They will use graphs to help investigate and display relationships in the data they collect. Then, using functions, they will summarize their findings and make predictions.
F.IF.B.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.	Interactive Notebook for functions. The images should focus on rate of change, table or graphical representations of rate of change, or comparisons of tables and graphs. Guided Instruction on how to find rate of change.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to use rate of change and	

Estimate the rate of change from a graph. **F.IF.C.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* *[Limit to linear and exponential] **F.IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of rate of change.	what purpose it has in the real world. Open-ended responses to questions involving rate of change. Student-led discussion of key points of rate of change. Technology based presentation on the different parts of exponential functions and other types of functions. Collected Homework Notebook Checks	

Unit 3: Quadratic Equations, Functions, & Polynomials
Overview At-a-Glance

<u>**Unit #3 – Quadratic Equations, Functions, & Polynomials**</u>

Unit Description:
This unit explains the operations, functions, and graphs of quadratic equations. It also extends this information to polynomials of higher degree.

Essential Skills:
- Perform arithmetic operations on polynomials
- Understand the relationship between zeros and factors
- Interpret the structure of expressions
- Solve equations and inequalities in one variable
- Create equations that describe numbers or relationships
- Interpret functions that arise in applications in terms of the context
- Represent and solve equations and inequalities graphically
- Build a function that models a relationship between two quantities
- Construct & compare linear, quadratic, & exponential models
- Build new functions from existing functions
- Analyze functions using different representations
- Use properties of rational and irrational numbers

Standards Addressed within this Unit			
Central Unit Standards- This unit will focus primarily on learning goals aligned with the following standards:	**Supporting Unit Standards-** This unit will also include activities aligned with the following standards:		
	Math Standards	**NGSS Standards**	**ELA Standards**
• A.APR.A.1 • F.IF.C.7	• 8.F.A.1	• HS.PS1.A	• RST.11-12.1
• A.SSE.A.2 • F.IF.C.8	• 8.F.A.2	• HS.PS1.B	• SL.11-12.5
• A.REI.B.4 • F.IF.C.9	• 8.F.A.3	• HS.ETS1.C	• WHST.11-12.7
• A.CED.A.1 • F.IF.B.6	• 8.F.B.4		• WHST.9-12.2
• F.IF.B.4 • F.LE.A.3			

• F.IF.B.5 • A.SSE.B.3 • F.BF.A.1 • N.RN.B.3	• F.BF.B.3 • A.REI.D.11 • A.APR.B.3	• 8.F.B.5		• WHST.9-12.2

Unit Details	
Modifications for Special Education Students, English Language Learners, Students at Risk of Failure, and Gifted Students- Modify instructional approach and/or assignments and evaluations as needed based for students with IEPs, 504s, ELLs and gifted and talented students including but not limited to: • Alternate responses (drawings with captions, spoken responses, etc.) • Advance/guided notes • Extended time • Teacher modeling (non-verbal teacher communication in addition to spoken instructions) • Simplified written and verbal instructions • ELL support materials (eDictionaries, native language prompts, etc.) • Increased integration of higher order thinking processes, creative and critical thinking activities, problem-solving, and open-ended tasks • Advanced pacing levels • Greater opportunities for freedom of choice and independent study that encourage independent and intrinsic learning • CSI projects to integrate higher-order thinking skills and creativity	**Integration of 21st century skills through NJSLS 9 and Career Education:** • Lessons, activities, and assessments require creativity and innovation on the part of the students. They are required to create projects and products as examples of mastery in each unit. • Critical thinking and problem-solving skills are a core component of learning and assessment throughout this curriculum. Students are required, in each unit, to advance their learning through all levels of Bloom's Taxonomy to address the evaluation, synthesis, and creation of products using learning at the highest levels. Problem-solving is a recurring theme in the curriculum as students must seek ways to creatively apply the concepts to solve problems rather than simply remember the material. • Students explore areas that support environmental literacy, including society's impact on the environment and what can be done to support environmental solutions. • Lessons integrate a focus on civic literacy so that student can better understand the rights and obligations of citizenship. • Learning advocates for health literacy as a critical component of a healthy lifestyle and the ability to make good health-related decisions. • Communication and collaboration is crucial for student success as learners. Throughout this curriculum, students must be able to communicate deep understanding through open ended responses (both orally and in writing). In addition, students are often required

• Create portfolios and peer lessons • Reteaching worksheets • Graphic organizers • Visual Vocabulary • Hands-on activity labs and modeling activities using tangrams • Graph paper to produce visual representations of transformations	to work collaboratively with their peers, which promotes the ability to succeed in the area of social cooperative work, increases communication skills, and promotes leadership and responsibility.
Assessments- including benchmarks, formative, summative, and alternative assessments **Formative** • Fluency Practice Activities • Pearson Lesson Quizzes • Topic Readiness Assessment • Mid-Topic Assessment • Mid-Topic Performance Task • (ExamView®) Lesson and Checkpoint Quizzes • PMI Quizzes • PowerAlgebra **Summative** • STEM Project • Topic Assessment • Topic Performance Task	**Suggested Interdisciplinary Activities for this Unit** **Career Education –** A cell phone company sells about 500 phones each week when it charges $75 per phone. It sells 20 more phones per week for each $1 decrease in price. The company's revenue is the product of the number of phones sold and the price of each phone. What price should the company charge to maximize its revenue? **Health/PE –** What function can be used to track a ball in flight? **English Language Arts & Literacy –** How can you use the discriminant to write a quadratic equation and to determine the number of solutions? Write an instruction set that could be used by a non-mathematician. **Art –** Either create a bowl or bring a bowl in. Measure three coplanar points on the inside of the bowl. Then create an equation for the parabola on the inside of the bowl by using those three points. **Science –** Parabolic relationships between horizontal distance and vertical distance of propelled objects. From Unit 4 (the aquarium), if the volume of an aquarium with height 3 feet is 420 feet cubed and the length is twice the width, what is the length? What is the ratio of the length, width and height?

	History/Social Studies – What wartime inventions require a parabola to represent the data? Ex. Trebuchet, cannon, etc. Punkin Chunkin video from the History Channel could be used as an introduction. **Technology –** Using the data from Unit 5, use Excel to generate quadratic lines of best fit. Discuss the correlation coefficients. Using the phone data from Unit 5, use a spreadsheet to find a line of best fit. Compare this to the line of best fit from a graphing utility. **World Language –** Translate key words: parabola, vertex, point, curve, quadratic, & polynomial. Then write a brief explanation in target language.

Unit Resources
Teachers should utilize school resources available in our Media Center to infuse alternate sources, perspectives, and approaches. Resources should include textual support but also span multimedia options to engage multiple modalities. In addition, to support struggling readers and increase rigor for advanced readers, the coursework may also draw on additional developmentally appropriate resources to facilitate challenging levels of work for all students.

Leveled Supplemental Materials and Media/School Library Resources	**Integration of the Technology Standard**
- Various leveled texts available via text, supplemental text, such as guided notes handouts, additional practice handouts, concept review handouts, sample/alternate tests - Additional supplemental resources: Learnzillion, Khan Academy, Math TV, BetterLesson, Kuta Software, Math Worksheets Land, - Informational Text resources from EdHelper, Scholastic Math - Digital Resources: NJSLS/CC Stations, CSI Math Projects, and NJSLS/CCSS Mathematics Warm-ups.	8.1.12.C.1 8.1.12.A.1 • Microsoft Office: Word, Excel, PowerPoint • Google Docs/Sheets/Slides- Use google docs to create a fake Facebook page about polynomials. The fake Facebook page should show knowledge of the content and the progression of knowledge gained throughout the unit. • Graphing Calculators/Online graphing tools • www.PowerAlgebra.com- Students will utilize this website to access their textbook or addition practice. http://parcc-assessment.org/ - Students will utilize this website to take sample PARCC exams

Unit 3: Quadratic Equations, Functions, & Polynomials
Targeted Instructional Planning to Address Central Unit Standards:

Central Unit Standard and Student Learning Objective	Suggested Instructional Activities	Suggested Student Output	Formative Assessments (Portfolios, Projects, Tasks, Evaluations, & Rubrics)
A.APR.A.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. **A.SSE.A.2.** Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*	**Illustrative Math Topics** A.APR.A.1 Powers of 11 Students should be able to determine the trend between the powers of 11 and the coefficients of x + 1 raised to the same power. A.SSE.A.2 Equivalent Expressions Students will be able to find values of missing coefficients by using distribution. Diagnostic assessment focusing on the standards from eighth grade and the previous unit to check for readiness of the entire unit. Guided Instruction on polynomial structures, their uses, and how to classify them. Pearson Active Math Exploration interactive computer models to give a hands on experience with polynomials Pearson Video tutorials for extra help or re-teaching	Journal entries written about the usage of polynomials in the real world. Open-ended responses to real world problems involving polynomials. Student-led discussion of the different parts of a polynomial and their classifications. Collected Homework Notebook Checks	**Formative** Fluency Practice Activities Pearson Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Mid-Topic Performance Task (ExamView®) Lesson and Checkpoint Quizzes PMI Quizzes

	Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC site. Informational Text and responses to comprehension questions based on real world problems involving polynomials.		**Summative** STEM Project Topic Assessment Topic Performance Task
A.REI.B.4. Solve quadratic equations in one variable. **A.CED.A.1.** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear functions and quadratic functions, and simple rational and exponential functions.	**<u>Illustrative Math Topics</u>** <u>A.REI.B.4 Visualizing Completing the Square</u> Students will use a visual representation of completing the square to solve a set of problems involving quadratics. <u>A.REI.B.4 Braking Distance</u> Solve a quadratic equation given values to plug into the equation. <u>A.REI.B.4 Two Squares are Equal</u> Set up and solve a quadratic equation that is not presented in standard form. Interactive Notebook for solving quadratics. The images should focus on the ways to factor quadratics. Guided Instruction on how to factor a quadratic and solve quadratics. Pearson Video tutorials for extra help or re-teaching	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to solve polynomials. Open-ended responses to questions involving solving quadratic functions. Student-led discussion on the different ways to solve quadratic functions. Technology based presentation about chain letters and how they get multiplied. Students	**Project** A chain letter (or email) tells its recipient to make copies and send them to others. The other people who receive it then need to make copies and send them out. The number of letters continues to grow. How fast will a chain letter grow? One student will receive a chain letter. That student will make copies and give them to classmates at the beginning of the next class period.

	Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC site. Informational Text and responses to comprehension questions involving solving quadratic equations.	should create a google sheets form with their data and create a formula based off this data. Collected Homework Notebook Checks	When you receive a copy of the chain letter, follow its instructions. Before the project begins, write down your predictions about what will happen as the chain letter is copied. How many copies do you think there will be after 5 class periods? after 10 class periods
F.IF.B.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* **F.IF.B.5.** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the*	**Illustrative Math Topics** F.IF.B.4 Words – Tables - Graphs Match graphs to their verbal descriptions and tables. F.IF.B.5 The restaurant Determine a domain and range for a real world situation that has no equations given. Interactive Notebook for domain and range of a quadratic. Students will create images of graphs, the process of finding the domain and range, or the different parts of a quadratic graph. Guided Instruction on the different parts of a quadratic graph and the domain and range of a quadratic. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC site.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to find the domain and range of a quadratic function. Open-ended responses involving the different parts of a quadratic and their purposes. Student-led discussion of key points of quadratic graphs. Technology based presentation about the different parts of a	Students will create a fake Facebook page to demonstrate their knowledge of polynomials. Students should demonstrate their knowledge of factoring, graphs, domain and range, as well as other topics learned in this unit.

function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function	Informational Text and responses to comprehension questions involving the domain and range of a quadratic.	quadratic. Students will be split into groups and each group will be given a different part of a quadratic graph. Students will report out the importance of their part. Collected Homework and Notebook Checks	
F.BF.A.1. Write a function that describes a relationship between two quantities. **F.IF.C.7.** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **F.IF.C.8.** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **F.IF.C.9.**	**Illustrative Math Topics** F.IF.C.7a Graphs of Quadratic Functions Graph multiple equations on the same graph using a graphing calculator, then answer questions about the graphs. F.IF.C.8a Springboard Dive Answer questions about a quadratic equation that require the knowledge of the usage of quadratics in real life. F.IF.C.8a Which Function? Match a quadratic graph to the function that represents it. F.IF.B.9 Throwing Baseballs Find the vertex of a parabola by using a graph and a function and then compare the two vertices. Interactive Notebook for quadratics. Students will create images about the different ways to represent quadratics	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to find the vertex of a quadratic when given in standard form. Open-ended responses to questions involving quadratic functions and their different parts. Student-led discussion of key parts of a quadratic function and how to find them.	

	or how to find important parts of a quadratic from a given form.	Collected Homework	
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	Guided Instruction on how to find important aspects of a quadratic (vertex, line of symmetry, x intercepts, and y intercepts) from two different quadratic forms. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC site. Informational Text and responses to comprehension questions involving the different parts of a quadratic.	Notebook Checks	
F.IF.B.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. **F.LE.A.3.** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or	**Illustrative Math Topics** F.IF.B.6 Mathemafish Population Use a scatter plot and apply a rate of change formula to find the amount of fish lost or gained over a period of time. F.LE.A.3 Population and Food Supply Find the point at which the food supply will be under the amount of people on the planet by using given equations and finding their intersection point. F.BF.B.3 Identifying Even and Odd Functions Determine whether the given function is odd or even. F.BF.B.3 Transforming the graph of a function	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about transforming a function. Open-ended responses to questions involving transformation of functions.	

(more generally) as a polynomial function. **F.BF.B.3.** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	Describe the given transformations, given in function notation, on a graph provided. Interactive Notebook for transformation of functions. The images should focus on the different transformations of functions. Guided Instruction on how to transform a function in function notation. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC site. Informational Text and responses to comprehension questions involving transformation of functions.	Student-led discussion of key points of transforming functions. Collected Homework Notebook Checks	
A.REI.D.11. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations.	**Illustrative Math Topics** A.REI.D.11 Introduction to Polynomials – College Fund Students will solve problems that require the creation and solving of polynomials of degree larger than 2. A.APR.B.3 Graphing from Factors 1 Students will graph polynomials from their factored forms by using x intercepts. N.RN.B.3 Operations with Rational and Irrational Numbers Determine what happens to rational and irrational numbers when different operations are applied to them.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about the uses of zeros in the real world. Open-ended responses to questions involving zeros of polynomials.	

Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* **A.APR.B.3.** Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. *[Algebra 1: limit to quadratic and cubic functions in which linear and quadratic factors are available]* **N.RN.B.3.** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	Interactive Notebook for zeros of a polynomials. The images should focus on the different ways to name a zero, the usage of a zero, and/or how to find a zero. Guided Instruction on how to solve for a zero of a polynomial function. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving solving for zeros.	Student-led discussion of key points of zeros. Technology based presentation about polynomials by creating a fake Facebook page. Students will be allowed to work in groups but material from the entire unit must be incorporated. Collected Homework Notebook Checks	

Unit 4: Modeling with Statistics
Overview At-a-Glance

Unit #4 – Modeling with Statistics
Unit Description: This unit focuses on representing and interpreting data of one or two variables. Also, this unit focuses on interpreting functions related to statistics.
Essential Skills: • Summarize, represent, and interpret data on a single count or measurement variable • Summarize, represent, and interpret data on two categorical and quantitative variables • Interpret functions that arise in applications in terms of the context

Standards Addressed within this Unit			
Central Unit Standards- This unit will focus primarily on learning goals aligned with the following standards: • S.ID.A.1 • S.ID.A.2 • S.ID.A.3 • S.ID.B.5 • S.ID.B.6 • F.IF.B.4 • F.IF.B.5	**Supporting Unit Standards-** This unit will also include activities aligned with the following standards:		
	Math Standards • 8.SP.A.1 • 8.SP.A.2 • 8.SP.A.3 • 8.SP.A.4 • 8.F.A.3 • 8.F.B.4	**NGSS Standards** • HS.ESS1.B • HS.ESS2.A • HS.ESS2.D • HS-ESS3.D	**ELA Standards** • RST.11-12.1 • RST.11-12.2 • RST.11-12.7 • SL.11-12.5

Unit Details	
Modifications for Special Education Students, English Language Learners, Students at Risk of Failure, and Gifted Students- Modify instructional approach and/or assignments and evaluations as needed based for students with IEPs, 504s, ELLs	**Integration of 21ˢᵗ century skills through NJSLS 9 and Career Education:** • Lessons, activities, and assessments require creativity and innovation on the part of the students. They are required to

and gifted and talented students including but not limited to:

- Alternate responses (drawings with captions, spoken responses, etc.)
- Advance/guided notes
- Extended time
- Teacher modeling (non-verbal teacher communication in addition to spoken instructions)
- Simplified written and verbal instructions
- ELL support materials (eDictionaries, native language prompts, etc.)
- Increased integration of higher order thinking processes, creative and critical thinking activities, problem-solving, and open-ended tasks
- Advanced pacing levels
- Greater opportunities for freedom of choice and independent study that encourage independent and intrinsic learning
- CSI projects to integrate higher-order thinking skills and creativity
- Create portfolios and peer lessons
- Reteaching worksheets
- Graphic organizers
- Visual Vocabulary
- Hands-on activity labs and modeling activities using tangrams
- Graph paper to produce visual representations of transformations
- Enrichment activities and worksheets

create projects and products as examples of mastery in each unit.

- Critical thinking and problem-solving skills are a core component of learning and assessment throughout this curriculum. Students are required, in each unit, to advance their learning through all levels of Bloom's Taxonomy to address the evaluation, synthesis, and creation of products using learning at the highest levels. Problem-solving is a recurring theme in the curriculum as students must seek ways to creatively apply the concepts to solve problems rather than simply remember the material.
- Learning advocates for health literacy as a critical component of a healthy lifestyle and the ability to make good health-related decisions.
- In order to succeed in this course, students must be able to use technology as a tool in order to research, organize, evaluate, and communicate information.
- Learning incorporates skills focusing on financial, economic, business, and entrepreneurial literacy.
- Students must be information literate, i.e. they must be able to find and use information effectively, in order to succeed in class as learning activities require independent research of relevant information outside of the provided textbook and/or resources.
- Students explore areas that support environmental literacy, including society's impact on the environment and what can be done to support environmental solutions.

Assessments- including benchmarks, formative, summative, and alternative assessments	Suggested Interdisciplinary Activities for this Unit
Formative • Fluency Practice Activities • Pearson Lesson Quizzes • Topic Readiness Assessment • Mid-Topic Assessment • Mid-Topic Performance Task • (ExamView®) Lesson and Checkpoint Quizzes • PMI Quizzes • PowerAlgebra quizzes **Summative** • STEM Project • Topic Assessment • Topic Performance Task • Unit 1-4 Cumulative/Benchmark Assessment	**Career Education** - A pollster selects 100 people from each town in a certain candidate's district to see if they support the candidate. Decide whether the sampling is random, systematic or stratified. **Health/PE –** Using Mean, Median, Mode, what are the highest scores in a tournament? Who benefits from each measurement and are there sports that use one specifically? Ex. Track and swimming. Compare the salaries of different sports. Which sport has the most outliers? **English Language Arts & Literacy –** How can you use a frequency table of a data set to construct a cumulative frequency table? Explain. **Art –** Take a piece of abstract art that has easily defined geometric shapes. If this piece of art was used as a dart board, determine the value of points for each given color. Solve by finding relative areas and probabilities of landing in each. **Science –** Organize and analyze data on endangered species or weather patterns. **History/Social Studies –** Using the data gathered in Ch 5, track the GDP and make predictions. Compare and contrast the predictions against reality. Is it possible to predict the GDP? Statistics are used in different ways for determining the results of elections and polls, population, world religion membership, and the casualties of various wars. How can the selection of method affect the outcome? **Technology –** For some civil cases, at least 9 of 12 jurors must agree on a verdict. How many combinations of 9 jurors are possible on a 12-person jury? Use a spreadsheet to define your answer. **World Languages –** What is the distribution of languages throughout the world in terms of population and/or countries? How is it changing?

	Unit Resources
	Teachers should utilize school resources available in our Media Center to infuse alternate sources, perspectives, and approaches. Resources should include textual support but also span multimedia options to engage multiple modalities. In addition, to support struggling readers and increase rigor for advanced readers, the coursework may also draw on additional developmentally appropriate resources to facilitate challenging levels of work for all students.

Leveled Supplemental Materials and Media/School Library Resources	**Integration of the Technology Standard**
• Various leveled texts available via text, supplemental text, such as guided notes handouts, additional practice handouts, concept review handouts, sample/alternate tests • Additional supplemental resources: Learnzillion, Khan Academy, Math TV, BetterLesson, Kuta Software, Math Worksheets Land, • Informational Text resources from EdHelper, Scholastic Math • Digital Resources: NJSLS/CC Stations, CSI Math Projects, and NJSLS/CCSS Mathematics Warm-ups.	• 8.1.8.A.5 • 8.2.8.A.2 • Microsoft Office: Word, Excel, PowerPoint • Google Docs/Sheets/Slides- Create a google sheet of two sets of data and analyze them utilizing the formulas and tools in google sheets. • Graphing Calculators/Online graphing tools • www.PowerAlgebra.com- Students will utilize this website to access their textbook or addition practice. http://parcc-assessment.org/ - Students will utilize this website to take sample PARCC exams

Unit 4: Modeling with Statistics
Targeted Instructional Planning to Address Central Unit Standards:

Central Unit Standard and Student Learning Objective	Suggested Instructional Activities	Suggested Student Output	Formative Assessments (Portfolios, Projects, Tasks, Evaluations, & Rubrics)
S.ID.A.1. Represent data with plots on the	**Illustrative Math Topics** S.ID.A.1-3 Haircut Costs Given data on haircuts, calculate basic statistical data.	Journal entries written about the usage of statistics in the real world.	**Formative** Fluency Practice Activities

real number line (dot plots, histograms, and box plots). **S.ID.A.2.** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. **S.ID.A.3.** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	S.ID.A.1-3 Speed Trap Create box plots of two different data tables S.ID.A.2-3 Measuring Variability in a Data Set Find deviations in data sets. S.ID.A.3 Identifying Outliers Use quartiles and the mean to determine outliers. Diagnostic assessment focusing on the standards from eighth grade and the previous unit to check for readiness of the entire unit. Guided Instruction on central tendency and the different ways of measuring variance. Pearson Active Math Exploration - interactive computer models to give a hands on experience with statistics Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions based on real world problems involving statistics.	Open-ended responses to real world problems involving statistics. Student-led discussion of central tendency and variance. Collected Homework Notebook Checks	Pearson Lesson Quizzes Topic Readiness Assessment Mid-Topic Assessment Mid-Topic Performance Task (ExamView®) Lesson and Checkpoint Quizzes PMI Quizzes PowerAlgebra self-check **Summative** STEM Project Topic Assessment
S.ID.B.5. Summarize categorical data for two categories	**Illustrative Math Topics** S.ID.B.5 Support for a Longer School Day? Use a table and interpret the data to make conclusions about the desires.	Notebooks will have notes on one side of the page and visual representations of the material on the other.	Topic Performance Task

in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. **S.ID.B.6.** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	S.ID.B.6 Laptop Battery Charge 2 Extrapolate from data the expected time that a battery will be charged. Interactive Notebook for data. The images should focus on different ways to graph data or the different types of data. Guided Instruction on how to represent and read data. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of data.	Journal entries written on how to use data and where it can be found in the real world. Open-ended responses involving data and how to enter it into technology. Student-led discussion on the different ways to present data. Technology based presentation about gathered data. The students will determine what information they would like to gather from other students and then they will go collect it. They will also need to present the data and analysis to the class. Collected Homework & Notebook Checks	Unit 1-4 Cumulative / Benchmark Assessment **Projects** School Survey: Students will be asked to construct and execute a quantitative survey on the school. They will collect and organize their date, determine the various measures of central tendency, and generate a visual data display portraying the results. In the end, students will create a visual and oral presentation both showing the data and justifying their various choices.
F.IF.B.4. For a function that models a relationship between two quantities, interpret key	**Illustrative Math Topics** F.IF.B.4 The Aquarium Students will need to make a graph that shows the height of water over time of an aquarium being filled with different situations occurring. F.IF.B.4 Containers	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about how to use and read graphs.	

features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* **F.IF.B.5.** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives*	Match the graph to the appropriate picture of the container being filled. F.IF.B.4-5 The Canoe Trip, Variation 2 Fill in a table using information given to determine the time needed to travel a certain distance in a canoe. Interactive Notebook for graphs. The images should focus on the relationship between a function and a graph. Guided Instruction on what a graph represents and how to read a graph. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of graphs.	Open-ended responses to questions that require the comprehension of graphs. Student-led discussion of key points of graphs. Technology based presentation about the a self-created graph. The students will make their own graphs and then make a story to go along with the graph. Finally, the students will present it to the class. Collected Homework Notebook Checks	Many schools celebrate Arbor Day by planting young trees to replenish our ecosystem. Trees use carbon dioxide that humans and animals exhale to make oxygen. Trees anchor the soil and prevent erosion. They also produce fruit. Wood from trees is used for the construction of everything from pencils to houses. As you work through the activities, you will learn more about the uses of trees. You will use formulas to analyze data and predict the production of wood and fruit. Then you will

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the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.			decide how to organize and display your results.

Unit 5: Introduction to Trigonometry
Overview At-a-Glance

Unit #5 – Introduction to Trigonometry
Unit Description: This unit focuses on learning the request material to understand trigonometry. These topics include rational equations, radicals, and basic trigonometric functions.
Essential Skills: • Define trigonometric ratios and solve problems involving right triangles • Use trigonometric functions to solve real life problems. • Solve rational equations for values relative unknowns. • Find the domain and range of rational equations • Simply radical expressions. • Solve radical equations.

Standards Addressed within this Unit			
Central Unit Standards- This unit will focus primarily on learning goals aligned with the following standards: • G.SRT.C.6 • G.SRT.C.7 • G.SRT.C.8 • N.RN.A.1 • N.RN.A.2 • N.RN.B.3 • A.APR.D.6 • A.APR.D.7	**Supporting Unit Standards-** This unit will also include activities aligned with the following standards:		
	Math Standards • NJSLS 6.EE.A.2 • NJSLS 6.G.A.3 • NJSLS 7.G.A.1 • NJSLS 7.G.A.2 • NJSLS 8.EE.A.2	**NGSS Standards** • HS.PS3.D • HS.PS4.A • HS.PS4.B • HS.PS4.C	**ELA Standards** • RST.11-12.1 • RST.11-12.7 • RST.11-12.8 • RST.9-10.8 • WHST.11-12.8 • WHST.9-12.2

Unit Details

Modifications for Special Education Students, English Language Learners, Students at Risk of Failure, and Gifted Students	Integration of 21st century skills through NJSLS 9 and Career Education:
Modifications for Special Education Students, English Language Learners, Students at Risk of Failure, and Gifted Students- Modify instructional approach and/or assignments and evaluations as needed based for students with IEPs, 504s, ELLs and gifted and talented students including but not limited to: • Alternate responses (drawings with captions, spoken responses, etc.) • Advance/guided notes • Extended time • Teacher modeling (non-verbal teacher communication in addition to spoken instructions) • Simplified written and verbal instructions • ELL support materials (eDictionaries, native language prompts, etc.) • Increased integration of higher order thinking processes, creative and critical thinking activities, problem-solving, and open-ended tasks • Advanced pacing levels • Greater opportunities for freedom of choice and independent study that encourage independent and intrinsic learning • CSI projects to integrate higher-order thinking skills and creativity • Create portfolios and peer lessons • Reteaching worksheets • Graphic organizers • Visual Vocabulary • Hands-on activity labs and modeling activities using tangrams • Graph paper to produce visual representations of transformations • Enrichment activities and worksheets	**Integration of 21st century skills through NJSLS 9 and Career Education:** • Lessons, activities, and assessments require creativity and innovation on the part of the students. They are required to create projects and products as examples of mastery in each unit. • Critical thinking and problem solving skills are a core component of learning and assessment throughout this curriculum. Students are required, in each unit, to advance their learning through all levels of Bloom's Taxonomy to address the evaluation, synthesis, and creation of products using learning at the highest levels. Problem-solving is a recurring theme in the curriculum as students must seek ways to creatively apply the concepts to solve problems rather than simply remember the material. • Students explore areas that support environmental literacy, including society's impact on the environment and what can be done to support environmental solutions. • Learning and assessment activities support the push to make students media literate, as they are often required to analyze, evaluate, and create messages in a wide variety of media modes, genres, and formats. • In order to succeed in this course, students must be able to use technology as a tool in order to research, organize, evaluate, and communicate information. • Activities in the curriculum help develop life and career skills in all students by promoting flexibility and adaptability, requiring initiative and self-direction in the learning process, supporting social and cross-cultural skills in both content and teamwork efforts, and measuring productivity and accountability through independent and group assignment completion.

Assessments- including benchmarks, formative, summative, and alternative assessments	Suggested Interdisciplinary Activities for this Unit
Formative • Fluency Practice Activities • Pearson Lesson Quizzes • Topic Readiness Assessment • Mid-Topic Assessment • Mid-Topic Performance Task • (ExamView®) Lesson and Checkpoint Quizzes • PMI Quizzes **Summative** • STEM Project • Topic Assessment • Topic Performance Task	**Career Education –** A construction worker is cutting along a diagonal of a rectangular board 15 ft. long and 8 ft. wide. What will be the length of the cut? **Health/PE –** Calculate the throwing distance of a ball from home to 2nd base. What velocity/time is necessary to prevent a stolen base? **English Language Arts & Literacy –** Are $\sqrt{3}$ and $\sqrt{12}$ like radicals? Can their sum be simplified? Can their product? Explain the difference. **Art –** Write a paper on the wavelengths of different colors? Why are they different? What other aspects are different than wavelength? **Science –** You need to build a handicapped ramp. The ground distance is 10 feet and the height is 4 feet. How long should the ramp be? Does it meet ADA specifications? **History/Social Studies –** Originally each face of the Great Pyramid of Giza was a triangle with base of 756 feet and height of 612 feet. How far is a corner of the base of a pyramid to its top? What are the current dimensions and how has the change affected the surface area and volume of the pyramid? **Technology -** Use technology to explore the graphs of many polynomial functions, and describe the shape, end behavior and number of zeros in order to make informal observations **Music –** Learn and sing the quadratic equation song (Pop Goes the Weasel).Use technology to explore the graphs of many polynomial functions, and describe the shape, end behavior and number of zeros to begin to make informal observations.

Unit Resources
Teachers should utilize school resources available in our Media Center to infuse alternate sources, perspectives, and approaches. Resources should include textual support but also span multimedia options to engage multiple modalities. In addition, to support struggling readers and increase rigor for advanced readers, the coursework may also draw on additional developmentally appropriate resources to facilitate challenging levels of work for all students.

Leveled Supplemental Materials and Media/School Library Resources	Integration of the Technology Standard
- Various leveled texts available via text, supplemental text, such as guided notes handouts, additional practice handouts, concept review handouts, sample/alternate tests - Additional supplemental resources: Learnzillion, Khan Academy, Math TV, BetterLesson, Kuta Software, Math Worksheets Land, - Informational Text resources from EdHelper, Scholastic Math - Digital Resources: NJSLS/CC Stations, CSI Math Projects, and NJSLS/CCSS Mathematics Warm-ups.	8.1.12.A.4 8.2.12.A.1 • Microsoft Office: Word, Excel, PowerPoint • Google Docs/Sheets/Slides- Student will create a slideshow or presentation that talks about how far they can see to the horizon. • Graphing Calculators/Online graphing tools • www.PowerAlgebra.com- Students will utilize this website to access their textbook or addition practice. http://parcc-assessment.org/ - Students will utilize this website to take sample PARCC exams

Unit 5: Introduction to Trigonometry

Targeted Instructional Planning to Address Central Unit Standards:

Central Unit Standard and Student Learning Objective	Suggested Instructional Activities	Suggested Student Output	Formative Assessments (Portfolios, Projects, Tasks, Evaluations, & Rubrics)
G.SRT.C.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading	**Illustrative Math Topics** G.SRT.C.6 Defining Trigonometric Ratio Use similar triangles to show trigonometric ratios. G.SRT.C.7 Sine and Cosine of Complimentary Angles Prove why sine and cosine of complimentary angles are equal.	Journal entries written about the usage of trigonometry in the real world.	**Formative** Fluency Practice Activities Pearson Lesson Quizzes

to definitions of trigonometric ratios for acute angles. **G.SRT.C.7** Explain and use the relationship between the sine and cosine of complementary angles. **G.SRT.C.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	G.SRT.C.8 Setting Up Sprinklers Determine which of two systems is better for watering a lawn from a picture of the two systems. Diagnostic assessment focusing on the standards from eighth grade and the previous unit to check for readiness of the entire unit. Guided Instruction on trigonometric function and their purpose. Pearson Active Math Exploration interactive computer models to give a hands on experience with trigonometry Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions based on real world problems involving trigonometry.	Open-ended responses to real world problems involving trigonometry. Student-led discussion of the different trigonometric functions. Technology based project that requires the students to find the distance to the horizon. The students will need to use trigonometry to find how far they can actually see. Collected Homework Notebook Checks	Topic Readiness Assessment Mid-Topic Assessment Mid-Topic Performance Task (ExamView®) Lesson and Checkpoint Quizzes PMI Quizzes **Summative** STEM Project Topic Assessment Topic Performance Task
N.RN.A.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a	**Illustrative Math Topics** N.RN.A.1 Extrending the Definitions of Exponents, Variation 2 Use a biological occurance to investigate rational exponents. N.RN.A.2 Rational or Irrational? Determine whether a set of operations will have a rational or irrational result.	Notebooks will have notes on one side of the page and visual representations of the material on the other. Journal entries written about to find the value	**Project** Suppose it's a clear day and you have a view of the horizon with no obstructions. The view may not be as clear as it might be from an air traffic

notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.* **N.RN.A.2** Rewrite expressions involving radicals and rational exponents using the properties of exponents. **N.RN.B.3** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	Interactive Notebook for irrational exponents. The images should focus on the result of have an irrational number in the exponent of a number. Guided Instruction on how to calculate a number with a irrational exponent and what an irrational exponent means in terms of radicals. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of irrational exponents.	of a number with a irrational exponent. Open-ended responses to questions that require the comprehension of irrational exponents. Student-led discussion of key points of irrational exponents. Collected Homework Notebook Checks	control tower, but it is fairly clear. How far would you be able to see to the horizon? You can use the Pythagorean theorem and other concepts in this chapter to find this distance. As you work through the chapter project, you will determine the distances you would be able to see to the horizon if you could stand on any planet, including Earth. Your project should include diagrams of the planets, formulas for the visible distances, and graphs of these formulas.
A.APR.D.6 Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are	**Illustrative Math Topics** A.APR.D.6 Combined Fuel Efficiency Use rational equations to solve for the combined fuel efficiency of a car.	Notebooks will have notes on one side of the page and visual representations of the material on the other.	

polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. **A.APR.D.7** Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	Interactive Notebook for rational functions. The images should focus on the graphs of rational functions, how to solve rational functions, or the simplification of rational functions. Guided Instruction on how to graph and solve rational functions. Pearson Video tutorials for extra help or re-teaching Brain Pop videos and activities as an alternative to standard instruction or for extra practice and remediation. PARCC Sample Questions found on the PARCC website. Informational Text and responses to comprehension questions involving the use of rational functions.	Journal entries written about how to solve rational functions. Open-ended responses to questions that require the comprehension of rational functions. Student-led discussion of how to graph rational functions. Collected Homework Notebook Checks	