

*EGG HARBOR TOWNSHIP PUBLIC SCHOOLS*

**NEW FOUNDATIONS MATH  
GRADE 12**

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Supervisor: Donna Freund

## NEW FOUNDATIONS MATH COURSE: STATEMENT OF PURPOSE

The primary focus of this newly established course will be to prepare our Special Education students for the mathematics they will encounter once they complete their high school curriculums, and move on to the next level. The New Foundations course will provide in-depth lessons and activities, which will be geared towards the skills needed to perform well on mathematics entrance exams into colleges and specific organizations/trades. We will seek to maximize students' performances on the following tests:

*Accuplacer Test*- placement exam from the College Board used by many colleges, technical schools, and institutions.

*ASVAB*- test used to measure future academic and occupational success in the military.

In addition to this preparation, another objective that will be stressed is a steady exposure to ALL of the letters of the STEM acronym (not just mathematics). In other words, the Common Core Standards that are presented in each unit will always be incorporated into applications in the fields of Science, Technology, and Engineering.

## PHILOSOPHY AND OBJECTIVES OF NEW FOUNDATIONS

Each class will consist of a small group of 12<sup>th</sup> graders who receive Special Education services. Because of these conditions, there will be a substantial emphasis on differentiating the instruction. The curriculum will be modified to each individual's needs, and student achievement will be based on one's progress throughout the year. Although modifications will be needed, this course will challenge each student with rigor and higher-thinking problem solving. In addition to the objectives that will be listed for each unit, there will also be several year-long, overarching goals for the students to consider.

- ❖ Students will strive to become fully engaged in their learning of math and develop an understanding of *WHY* they will continue to need math skills throughout their lives.
- ❖ Students will aim to master the skill of working cooperatively with peers.
- ❖ Students will use this course to continuously improve on their organizational skills, time-management skills, and study habits.

## PACING DETAILS AND LESSON PROCEDURES

**Curriculum Map**- The first marking period of the year will be dedicated to a review of basic mathematical processes of the real number system. It will cover computing with fractions and decimals, Basic Principles of Exponents and Roots, and Order of Operations. This marking period will be completed without any calculator use. The remaining 3 marking periods will have the class practicing and being assessed on Common Core standards from the Algebra 1

curriculum. Certain aspects, such as working with quadratics and graphing functions/equations, will not be stressed as heavily, to mirror what is seen on the practice tests for the above mentioned placement exams.

**Class Schedule-** We have a 55-minute rotating block schedule. Classes will meet on 3 out of every 4 days. Therefore, the classes will break down into the following days and time frames:

<u>Day 1</u>		<u>Day 2</u>		<u>Day 3</u>	
Warm Up	5 min	Warm Up	5 min	Warm up/ Review	10 min
Mini Lesson w/ Guided Notes	15 min	Mini Lesson w/ Guided Notes	15 min	Quiz & Partner Grade OR Test	40 min
Classwork w/ Partner	20 min	Formative Assessment	20 min	Built-in Transition Time	5 min
Closure	10 min	Closure	10 min		
Built-in Transition Time	5 min	Built-in Transition Time	5 min		

### Formative Assessments

- Red, Yellow, Green- Colored index cards are given to students and they display a color based on understanding of topic.
- Plickers- App on Iphone which polls students on questions and displays data for understanding.
- IXL.com sections- Website that provides practice on remedial areas
- Personal white boards

### Closure

- Video from bigideasmath.com or teachertube.com with Reflection
- Exit Ticket

## **RESOURCES FOR CURRICULUM**

1. Textbook: "Intermediate Algebra" Tenth Edition. Lial, Hornsby, McGinnis. Pearson Education, Inc.
2. Download: "Algebra I Super Bundle" Lessons and Activities. Just Mathematics
3. Download: "42 Printable Math Games for Students" Mathfilefoldergames.com
4. BigIdeasMath.com
5. Download: "FractionPrintablesCCSSAligned" Rebecca Rojas. CreateTeachShare.com

## **THE EGG HARBOR TOWNSHIP SCHOOL DISTRICT CURRICULUM TEMPLATE**

The Egg Harbor Township School District has embraced the backward-design model as the foundation for all curriculum development for the educational program. When reviewing curriculum documents and the Egg Harbor Township curriculum template, aspects of the backward-design model will be found in the stated enduring understandings/essential questions, unit assessments, and instructional activities. Familiarization with backward-design is critical to working effectively with Egg Harbor Township's curriculum guides.

**Unit Name: Review of the Real Number System**  
**Author: Special Ed Math**

## UNIT (R)

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

This Review unit will consist of the use of variables to transform English phrases into mathematical expressions; using the order of operations to simplify expressions; exploring function rules and learn to identify relationships with functions; extending ability to calculate with whole numbers, decimals, and fractions to include integers; use the order of operations and the distributive property to simplify expressions, learn how to calculate with theoretical and experimental probability.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialIntermAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSA-SSE.A.1a** - Interpret parts of an expression, such as terms, factors, and coefficients.

**MA.9-12.CCSS.Math.Content.HSA-SSE.A.1b** - Interpret complicated expressions by viewing one or more of their parts as a single entity.

### ENDURING UNDERSTANDINGS

- Basic Operations with whole numbers, fractions, and decimals
- Function Notation
- Order of Operations
- Concept of Variables

### **ESSENTIAL QUESTIONS**

- How can you represent quantities, patterns, and relationships?
- How are properties related to algebra?

### **KNOWLEDGE AND SKILLS**

#### **Students will be able to**

- Write sets using set notation.
- Use number lines
- Know the common sets of numbers.
- Find additive inverses.
- Use absolute value
- Use inequality symbols

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Linear Equations and Applications**  
**Author: Special Ed Math**

# UNIT 1

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

## **UNIT SUMMARY**

Unit 1 will have students solve equations, including those with variables on both sides, using properties of equality; develop the ability to solve problems by defining variables, relating them to one another, and writing an equation; use proportions to measure objects indirectly.

## **UNIT RESOURCES**

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

### **Internet Resource Links:**

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialIntermAlg/playlists>

## STAGE ONE

### **GOALS AND STANDARDS**

**MA.9-12.CCSS.Math.Content.HSA-CED.A.1** - [*Standard*] - Create equations and inequalities in one variable and use them to solve problems.

**MA.9-12.CCSS.Math.Content.HSA-REI.B.3** - [*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

### **ENDURING UNDERSTANDINGS**

- Write, solve, and graph one-step linear equations.
- Formulate and use different strategies to solve one-step and multi-step linear equations.
- Create models to represent, analyze, and solve problems related to linear equations.
- Solve literal equations for a variable.

## **ESSENTIAL QUESTIONS**

- How can you solve a multi-step equation?
- How can you check the reasonableness of your solution?

## **KNOWLEDGE AND SKILLS**

### **Students will be able to**

- Distinguish between expressions and equations.
- Identify linear equations.
- Solve equations by using distributive property.
- Solve equations with fractions and decimals.
- Solve literal equations.
- Translate from words to mathematical expressions.

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Linear Inequalities and Absolute Value**  
**Author: Special Ed Math**

## UNIT 2

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 2 will have students graph inequalities; solve inequalities, noting the differences from the methods used for solving equations; write and solve compound inequalities by interpreting phrases that use and or or.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialInterAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSA-CED.A.1** - [*Standard*] - Create equations and inequalities in one variable and use them to solve problems.

**MA.9-12.CCSS.Math.Content.HSA-REI.B.3** - [*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

### ENDURING UNDERSTANDINGS

- Write, solve, and graph one-step linear inequalities.
- Formulate and use different strategies to solve one-step and multi-step linear inequalities, including inequalities with rational coefficients.
- Write, solve, and graph one-step and multi-step inequalities in one and two variables.
- Articulate the concept of absolute value and what it is used for.
- Solve absolute value equations.



## **ESSENTIAL QUESTIONS**

- How can you use an inequality to describe a real-life statement?
- What usages are there for finding absolute value in the real world?

## **KNOWLEDGE AND SKILLS**

### **Students will be able to**

- Solve linear inequalities using the addition and multiplication property.
- Solve linear inequalities with three parts.
- Solve applied problems using linear inequalities.
- Use the distance definition of absolute value.
- Solve absolute value equations that involve rewriting.

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Systems of Linear Equations**  
**Author: Special Ed Math**

## UNIT 3

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 3 will have students extend their ability to solve equations to include solving a system of two equations in two variables; learn methods of solving a linear system, including graphing, substitution, and elimination, and how to determine which method is best for a given situation.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialInterAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSA-REI.C.5** - [*Standard*] - 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.

**MA.9-12.CCSS.Math.Content.HSA-REI.C.6** - [*Standard*] - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

### ENDURING UNDERSTANDINGS

- Reason about and solve simple one-variable equations and inequalities.
- Write and solve one-step and two-step linear equations in one variable with one solution, no solution, or infinitely many solutions.
- Solve systems of two linear equations in two variables algebraically and graphically.
- Graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

## **ESSENTIAL QUESTIONS**

- How can you solve a system of equations or inequalities?
- Can systems of equations model real-world situations?

## **KNOWLEDGE AND SKILLS**

### **Students will be able to**

- Decide whether an ordered pair is a solution of a linear system
- Solve linear systems by SUBSTITUTION
- Solve linear systems by ELIMINATION
- Solve money problems using two variables
- Solve distance-rate-time problems using 2 variables

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Properties of Exponents**  
**Author: Special Ed Math**

## UNIT 4A

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 4A will have students extend knowledge about exponents to include zero and negative exponents; learn the properties of exponents, and how exponents are used to write a geometric sequence; graph exponential functions by making a table.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialIntermAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSN-RN.A.1** - [*Standard*] - Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.

**MA.9-12.CCSS.Math.Content.HSN-RN.A.2** - [*Standard*] - Rewrite expressions involving radicals and rational exponents using the properties of exponents.

### ENDURING UNDERSTANDINGS

- Extend understandings of numbers to the system of rational numbers.
- Evaluate expressions involving whole-number exponents.
- Reason about and solve one- variable equations.
- Work with radicals and integer exponents.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- Extend the properties of exponents to rational exponents.

## **ESSENTIAL QUESTIONS**

- How can you represent very large and very small numbers?
- How can you simplify expressions involving exponents?
- What are the characteristics of exponential functions?

## **KNOWLEDGE AND SKILLS**

### **Students will be able to**

- Use the product rule for exponents.
- Define 0 and negative exponents.
- Use the quotient rule for exponents.
- Use the power rule for exponents.
- Simplify exponential expressions.

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

## Unit Name: **Polynomials and their Functions**

Author: Special Ed Math

# UNIT 4B

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### **UNIT SUMMARY**

Unit 4B will have students categorize polynomials by their degree and number of terms; perform operations with polynomials, examine quadratic equations and their graphs; solve quadratic equations by various techniques such as finding square roots, completing the square, and applying the quadratic formula; determine an appropriate linear, quadratic, or exponential model for real-world data.

### **UNIT RESOURCES**

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### **Internet Resource Links:**

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialInterAlg/playlists>

## STAGE ONE

### **GOALS AND STANDARDS**

**MA.9-12.CCSS.Math.Content.HSA-APR.A.1** - [*Standard*] - 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.

**MA.9-12.CCSS.Math.Content.HSA-APR.C.4** - [*Standard*] - Prove polynomial identities and use them to describe numerical relationships.

### **ENDURING UNDERSTANDINGS**

- Evaluate algebraic expressions at specific values of their variables.
- Solve one-step linear equations.
- Perform arithmetic operations on polynomials.

- Multiply polynomials using FOIL and distribution.
- Model quadratic polynomials as real-life use of measuring an arch.

### **ESSENTIAL QUESTIONS**

- How does the graph of a quadratic function relate to its algebraic equation?
- How does the FOIL method use properties we have learned in previous chapters?

### **KNOWLEDGE AND SKILLS**

#### **Students will be able to**

- Know the basic definitions for polynomials.
- Add and subtract polynomials.
- Recognize and evaluate polynomial functions.
- Multiply any two polynomials along with polynomial functions.
- Divide polynomial functions.

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Factoring**  
**Author: Special Ed Math**

## UNIT 5

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 5 will have students explore all methods of Factoring terms. Students will use factoring to solve quadratic equations. Many activities will cover the Greatest Common Factor and how to find it. Students will factor terms by using the "Easy Method", the "Slide and Divide Method", and the "Quadratic Formula".

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialInterAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSA-SSE.B.3a** - Factor a quadratic expression to reveal the zeros of the function it defines.

**MA.9-12.CCSS.Math.Content.HSF-IF.C.8a** - Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

### ENDURING UNDERSTANDINGS

- Quadratic functions can be factored by breaking them down into two binomials in parentheses, or by removing the greatest common factor.
- There are simple rules for multiplying and dividing exponential expressions. When adding and subtracting monomials, you can only combine like terms.

### ESSENTIAL QUESTIONS



- Why should we factor?
- How does the graph of a quadratic function relate to its algebraic equation?

## **KNOWLEDGE AND SKILLS**

### **Students will be able to**

- Factor out the Greatest Common Factor
- Factor by Grouping
- Factor trinomials when the coefficient of the second-degree term is 1
- Factor trinomials when the coefficient of the second-degree term is not 1
- Factor a difference of squares
- Factor a perfect square trinomial
- Learn and use the Zero Factor Property

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Rational Expressions and Functions**  
**Author: Special Ed Math**

## UNIT 6

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 6 will have students combine rational expressions using addition, subtraction, multiplication, and division; graph and solve equations involving rational expressions; use permutations and combinations to find the number of outcomes of real-world situations.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialInterAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSF-IF.A.1** - [*Standard*] - Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .

**MA.9-12.CCSS.Math.Content.HSF-IF.A.2** - [*Standard*] - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

### ENDURING UNDERSTANDINGS

- Apply properties of operations to generate equivalent expressions.
- Solve simple one-variable equations to solve real-life and mathematical problems.
- Use variables to represent two quantities that change in relationship to one another. Use and simplify algebraic expressions to solve problems.

- Analyze and solve linear equations to solve real-life and mathematical problems.
- Create equations that describe numbers or relationships.
- Add, subtract, multiply, and divide rational expressions.
- Create and solve rational equations in one variable, and use them to solve problems.

### **ESSENTIAL QUESTIONS**

- How can you recognize when two variables vary directly?
- How can you recognize when they vary inversely?

### **KNOWLEDGE AND SKILLS**

#### **Students will be able to**

- Define rational expressions
- Multiply and Divide rational expressions
- Find reciprocals for rational expressions
- Determine the domain of the variable in a rational equation
- Recognize the graph of a rational function

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Roots and Radicals**  
**Author: Special Ed Math**

## UNIT 7

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 7 will have students explore operations with roots and radicals. Students will practice defining the parts of the radical expression and graph functions defined by radical expressions. The class will use examples involving time and measurement with differentiated projects for each tier. Finally, students will manipulate the most common geometric uses of radical expressions.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialIntermAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSN-RN.A.2** - [*Standard*] - Rewrite expressions involving radicals and rational exponents using the properties of exponents.

**MA.9-12.CCSS.Math.Content.HSN-CN.A.1** - [*Standard*] - Know there is a complex number  $i$  such that  $i^2 = -1$ , and every complex number has the form  $a + bi$  with  $a$  and  $b$  real.

### ENDURING UNDERSTANDINGS

- Write, analyze, and solve one- variable linear equations.
- Find the areas of right triangles.
- Understand the connections between proportional relationships, lines, and linear equations.
- Draw and construct triangles and describe the relationships between them.
- Evaluate square roots of small perfect squares.
- Understand and apply the Pythagorean Theorem.

- Solve square root equations.

### **ESSENTIAL QUESTIONS**

- How are radical expressions represented?
- What are the characteristics of square root functions?
- How can you solve a radical equation?

### **KNOWLEDGE AND SKILLS**

#### **Students will be able to**

- Find roots of numbers
- Define and use expressions of the form  $a^m/n$
- Use the rules for exponents with rational exponents
- Simplify radical expressions involving addition and subtraction
- Rationalize denominators with radicals

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Graphs, Linear Equations, and Functions**  
**Author: Special Ed Math**

## UNIT 8

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 8 will have students learn how to write linear equations and recognize them in different forms; understand how the slope of a line can be interpreted in real-world situations; determine whether the graphs of two linear equations are parallel or perpendicular.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialIntermAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSF-IF.C.7a** - Graph linear and quadratic functions and show intercepts, maxima, and minima.

**MA.9-12.CCSS.Math.Content.HSF-IF.B.4** - [*Standard*] - 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.

### ENDURING UNDERSTANDINGS

- Construct and analyze tables, graphs, and equations that represent linear relationships between dependent and independent variables.
- Understand the connections between proportional relationships, lines, and linear equations.
- Construct and analyze tables, graphs, and models to represent, analyze, and solve problems related to linear functions, including analysis of domain, range, and the difference between discrete and continuous data.
- Compare graphs of linear and nonlinear functions.

## ESSENTIAL QUESTIONS

- How can you find the domain and range of a function?
- What types of relationships can be modeled by linear graphs?

## KNOWLEDGE AND SKILLS

### Students will be able to

- Recognize equations of horizontal and vertical lines and lines passing through the origin
- Solve problems involving average rate of change
- Write an equation of the line that models real data
- Distinguish between dependent and independent variables

## STAGE TWO

### PERFORMANCE TASKS

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### OTHER EVIDENCE

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## STAGE THREE

### LEARNING ACTIVITIES

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises

**Unit Name: Statistics and Probability**  
**Author: Special Ed Math**

## UNIT 9

Subject: New  
Foundations  
Math  
Course/Grade: 12  
School: Egg  
Harbor Township  
High School

Country: USA

State/Group: **NJ**

### UNIT SUMMARY

Unit 9 will have students explore basic data representation methods such as mean, median, mode, and range. Fractions will be revisited and students will understand how properties of fractions and ratios apply to probability. An interactive dice game will be included where students break into groups and simulate dice rolls. Students will work with different types of graphs such as box and whisker plots.

### UNIT RESOURCES

Textbook: Intermediate Algebra by Lial, Hornsby, McGinnis

#### Internet Resource Links:

<https://www.bigideasmath.com/teachers/>

<https://www.youtube.com/user/LialIntermAlg/playlists>

## STAGE ONE

### GOALS AND STANDARDS

**MA.9-12.CCSS.Math.Content.HSN-Q.A.1** - [*Standard*] - 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.

**MA.9-12.CCSS.Math.Content.HSN-Q.A.3** - [*Standard*] - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

### ENDURING UNDERSTANDINGS

- Determine measures of central tendency including mean, median, mode, and range.
- Select appropriate measures of central tendency to describe a data set.
- Construct and analyze histograms, stem- and-leaf plots
- Construct and analyze dot plots, histograms, box-and-whisker plots, and scatter plots.



- Use the shape of a data distribution to select appropriate measures of central tendency and dispersion, and to account for the effects of outliers in the data.

### **ESSENTIAL QUESTIONS**

- How can collecting and analyzing data help you make decisions or predictions?
- How can you make and interpret different representations of data?
- How is probability related to real-world events?

### **KNOWLEDGE AND SKILLS**

#### **Students will be able to**

- Convert the mean (average) of data involving grades, height, and baseball statistics
- Construct a Box and Whisker plot displaying the range and median.
- Apply algebraic principles to find probability

## **STAGE TWO**

### **PERFORMANCE TASKS**

- Quizzes and Tests
- Graphic Organizers
- Cooperative Learning Activities

### **OTHER EVIDENCE**

- IXL.com
- Notebook Checks
- Plickers
- Summative Assessments

## **STAGE THREE**

### **LEARNING ACTIVITIES**

- Create artistic "MindMap" of key terms for the unit
- Group educational games
- IXL Challenge- Rewards for most correct problems
- Interactive SMARTBoard exercises