# ALGEBRA I
# GRADES 8-12

THE EWING PUBLIC SCHOOLS
2099 Pennington Road
Ewing, NJ 08618

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In accordance with The Ewing Public Schools' Policy 2230, Course Guides, this curriculum has been reviewed and found to be in compliance with all policies and all affirmative action criteria.

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## Course Description and Rationale

A famous mathematician, al-Khwarizmi from 9th century Baghdad, wrote a treatise proposing a mathematical method where an unknown quantity could be found by balancing it with a known result and carrying out the same mathematical operation to both sides of the balance. This treatise known as al-jabr has developed into one our most fundamental mathematical practices known as algebra.

Simply put, algebra is about finding the unknown or it is about putting real life problems into equations and then solving them. This branch of mathematics substitutes letters for numbers. An algebraic equation represents a scale, what is done on one side of the scale with a number is also done to the other side of the scale. The principle goal in algebra is to find the unknown whether for a specific situation or across a range of possibilities.

This course is designed to emphasize the study of multiple representations of linear and non-linear functions. It includes mathematical concepts for working with rational numbers, various expressions, analyzing and solving linear equations and inequalities, data analysis, probability, statistics, and polynomials. Students will use hands-on materials and calculators when needed in solving problems where the algebra concepts are applied.

Mathematics is opportunity gateway. The more math one has, the greater opportunity for college and university entrances leading to greater opportunity for jobs in actuary, business, engineering, science, technology, etc. Algebra provides the solid foundation for students' futures in the area of mathematics. As the course develops students will be exposed to real-world problem solving, developing their mathematical thinking, specifically logic, patterns, problem solving, deductive and inductive reasoning.

## The Ewing Public Schools' Math Vision

*The Ewing Public Schools will deliver an instructional program in mathematics where students are actively engaged in the discovery of math concepts and are applying these concepts in ways that they find meaningful and relevant.*

*Ewing students will be mathematical thinkers who can reason, communicate and solve problems.*

*Ultimately, Ewing students will master and will be able to utilize these math concepts and skills throughout their lives.*

21st Century Skills - During this course, students will work on developing, to an age appropriate level, the following 21st century skills:

**Career Readiness Pathways**:

- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.

**Learning and Innovation Skills**

**Creativity and Innovation**

Think Creatively

- Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

Work Creatively with Others

- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes

**CRITICAL THINKING AND PROBLEM SOLVING**

Reason Effectively

- Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Use Systems Thinking

- Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

Make Judgments and Decisions

- Effectively analyze and evaluate evidence, arguments, claims and beliefs
- Synthesize and make connections between information and arguments
- Interpret information and draw conclusions based on the best analysis

Solve Problems

- Identify and ask significant questions that clarify various points of view and lead to better solutions

## COMMUNICATION AND COLLABORATION

Communicate Clearly

- Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
- Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)
- Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact
- Communicate effectively in diverse environments (including multi-lingual)

Collaborate with Others

- Assume shared responsibility for collaborative work, and value the individual contributions made by each team member

## Information, Media, and Technology Skills

### Informational Literacy

Access and Evaluate Information

- Evaluate information critically and competently

Use and Manage Information

- Use information accurately and creatively for the issue or problem at hand

## Life and Career Skills

### Social and Cross-Cultural Skills

Interact Effectively with Others

- Know when it is appropriate to listen and when to speak

Work Effectively in Diverse Teams

- Respond open-mindedly to different ideas and values

Be Responsible to Others

- Act responsibly with the interests of the larger community in mind

## Technology Integration

8.1 Educational Technology

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**ELA Integration:**

SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with peers on *grades 9–10 topics, texts, and issues,* building on others' ideas and expressing their own clearly and persuasively.

A. Come to discussions prepared having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
B. Collaborate with peers to set rules for discussions (e.g. informal consensus, taking votes on key issues, presentation of alternate views); develop clear goals and assessment criteria (e.g. student developed rubric) and assign individual roles as needed.
C. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
D. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.

SL.9-10.3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any false reasoning or distorted evidence.

SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience

## Unit 1: Equations in One Variable (20 Days)

### Why Is This Unit Important?

This introductory unit will serve to develop the basic pre-algebra skills needed to succeed in this course. The big ideas embedded through this unit are:

- Writing and evaluating algebraic expressions
- Using expressions to write equations and inequalities
- Representing functions as verbal rules, tables and graphs
- Performing operations with real numbers
- Applying properties of real numbers
- Classifying and reasoning with real numbers
- Solving equations in one variable
- Solving proportions and percent problems
- Rewriting equations in two or more variables

**Enduring Understandings:** Students will understand:

- Evaluate expressions
- Apply or order of operations
- Write expressions, equations and inequalities
- Use a problem solving plan
- Represent functions as rules, graphs, and tables
- Use integers and rational numbers
- Add, subtract, multiply and divide real numbers
- Apply the distributive property
- Find square roots and compare real numbers
- Solve one-step, two-step and multi-step equations
- Solve equations with variables on both sides
- Write and solve ratios and proportions
- Solve percent problems
- Rewrite equations and formulas

### Essential Questions:

- How do you evaluate algebraic expressions and powers?
- How do you use the order of operations to evaluate an expression?
- How do you write an expression to represent a real-world situation?
- How do you write equations and inequalities?
- How can you use a problem solving plan to solve a problem?
- How do you represent functions as tables, graphs and rules?
- How do you compare, add, subtract, multiply and divide positive and negative numbers?
- How do you use the distributive property to simplify expressions?
- How do you evaluate a square root and compare real numbers?

- How do you solve one-step, two-step and multi-step equations using subtraction, addition, multiplication and division?
- How do you solve equations with variables on both sides?
- How do you write and find ratios and proportions?
- How do you solve percent problems?
- How do you rewrite equations?

**Acquired Knowledge:** After studying the material of this unit, the students should be able to:

- Identify functions as a table graph, or a rule
- Define order of operations
- Identify a variable and algebraic expression
- Identify the distributive property
- Define a real number, integer and whole number

**Acquired Skills:** After studying the material of this unit, the student should be able to:

- Evaluate algebraic expressions and powers
- Write and rewrite an equation
- Problem solving strategies
- Solve ratios, percents and proportions
- Evaluate a square root and compare real numbers
- Solve one-step, two-step and multi-step equations using subtraction, addition, multiplication and division
- Solve inequalities
- Perform order of operations

**Differentiation:**

<u>Enrichment</u>:

- Add extension activities
  - "Determine Whether a Relation Is a Function"
  - "Perform Matrix Addition, Subtraction and Scalar Multiplication"
  - "Apply Proportions to Similar Figures"
  - "Find percent of Change"

<u>Supplement</u>:

- Math Career Exploration Project - Brochure
- Human Number Line
- Scavenger Hunt
- Find Someone Who…
- Four Corners Rotation
- Order of Operations Game
- Inequality Activity

**Assessments:**

Formative Assessments:

- Assessment Checklist for Evaluating Expressions
- Assessment Checklist for Solving Equations
- Assessment Checklist for Writing Equations
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- Chapter Assessments

Benchmarks

- Equations with One Variable Assessment

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

**List of Applicable New Jersey Student Learning Standards Covered in This Unit:**

NJSLS. A-SSE.1
NJSLS. A-CED.1
NJSLS. A-REI.1,3-4
NJSLS. F-IF.1-2
NJSLS. F-BF.1
NJSLS. S-ID.1
NJSLS.MP.1-8

**Suggested Learning Experiences and Instructional Activities:**

Anticipatory Sets:

- Find and calculate sports statistics
- Use order of operations to determine online music costs
- Compare temperature all over the world
- Solve equations to fins a scuba diver's depth

In-Class Activities:

- Algebra Tile Activity
- Human Number Line
- Scavenger Hunt
- Find Someone Who…
- Four Corners Rotation
- Order of Operations Activity
- Graphing Paper Activity
- Function/Spreadsheet Activity

Websites:

- Virtual Manipulatives http://nlvm.usu.edu/en/nav/category_g_4_t_2.html

## Unit 2: Equations in Two Variables (25 Days)

### Why Is This Unit Important?

This unit will serve to develop the basic understanding of creating lines, graphing and solving linear systems. The big ideas embedded through this unit are:

- Graphing linear equations and functions using a variety of methods
- Recognizing how changes in linear equations and functions affect their graphs
- Using graphs of linear equations and functions to solve real-world problems
- Writing linear equations in a variety of forms
- Using linear models to solve problems
- Modeling data with a line of fit
- Applying properties of inequality
- Using statements with "and" or "or"
- Graphing inequalities
- Solving linear systems by graphing and using algebra
- Solving systems of linear inequalities

**Enduring Understandings:** Students will understand:

- Plot points in a coordinate plane
- Graph linear equations
- Graph using intercepts and slope-intercept form
- Find slope and rate of change
- Model direct variation
- Graph linear functions
- Write and use linear equations in slope-intercept and standard form
- Write equations of parallel and perpendicular lines
- Fit a line to data
- Predict with linear models
- Solve multi-step and compound inequalities using addition, subtraction, multiplication and division
- Solve absolute vale equations and inequalities
- Graph linear inequalities in two variables
- Solve linear systems by graphing, substitution, adding or subtracting, and by multiplying first
- Solve special types of linear systems
- Solve systems of linear inequalities

**Essential Questions:**

- How do you plot points in a coordinate plane?
- How do you graph linear equations?
- How do you use intercepts top graph equations?
- How do you find the slope of a line?
- How do you write an equation of a line in slope-intercept form?
- How do you find an equation of a line given two points?
- How do you write linear equations in point-slope and standard form?
- How do you write equations of parallel and perpendicular lines?
- How do you make scatter plots and write equations to model data?
- How can you use a best fitting line to make predictions about data?
- How do you solve and graph inequalities, multi-step inequalities and compound inequalities using addition, subtraction, multiplication and division?
- How do you solve absolute value of equations and inequalities?
- How do you graph a linear inequality in two variables?
- How do you solve systems of linear equations by graphing, substitution and elimination?
- How can you identify the number of solutions of a linear system?
- How do you solve systems of linear inequalities in two variables?

**Acquired Knowledge:** After studying the material of this unit, the students should be able to:

- Identify point-slope form
- Identify standard form
- Identify slope-intercept form
- Distinguish between parallel and perpendicular lines
- Find information and draw conclusions from scatter plots
- Define the properties of inequalities

**Acquired Skills:** After studying the material of this unit, the student should be able to:

- Plot points in a plane
- Solve linear systems through various methods
- Find slope
- Create a scatter plot
- Write equations in point-slope, slope-intercept and standard form
- Solve inequalities, multi-step inequalities, compound inequalities and compound inequalities

**Differentiation:**

Enrichment:

- Add extension activities
  - "Identify Discrete and Continuous Functions"
  - "Relate Arithmetic Sequences to Linear Functions"
  - "Graph Absolute Vale Functions"

Supplement:

- Human Scatter plot
- Linear Systems Activity
- Human Coordinate Plane
- Four Corners Rotation
- Slope Picture Project
- Monopoly Project

**Assessments:**

Formative Assessments:

- Assessment Checklist for Solving Equations with 2 Variables
- Assessment Checklist for Best Line Fit
- Assessment Checklist for Graphing Inequalities
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- Chapter Assessments

Benchmarks

- Equations with Two Variables Assessment

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

**List of Applicable New Jersey Student Learning Standards Covered in This Unit:**

NJSLS. A-CED.2-4
NJSLS. A-REI.1,5-7,10-12
NJSLS. F-IF.1-2, 4-7
NJSLS. F-BF.1
NJSLS. S-ID.6-7
NJSLS.MP.1-8

**Suggested Learning Experiences and Instructional Activities:**

Anticipatory Sets:

- Graph linear systems through animal populations
- Model distances in sports
- Model trends in high school
- Describe possible heights
- Analyze rules of competitions
- Solve problems about preparing food

In-Class Activities:

- Slope Picture Project
- Human Coordinate Plane
- Four Corners Rotation
- Linear System Game
- Inequality Game
- Jeopardy Review Game
- Vocabulary Crossword Puzzles

Websites:

Virtual Manipulatives http://nlvm.usu.edu/en/nav/category_g_4_t_2.html

## Unit 3: Exponential and Quadratic Function (15 Days)

### Why Is This Unit Important?

This unit will serve to develop the basic skills for understanding exponents, polynomials and quadratic functions. The big ideas embedded through this unit are:

- Applying properties of exponents to simplify expressions
- Working with numbers in scientific notation
- Writing and graphing exponential functions
- Adding, subtracting, multiplying and factoring polynomials
- Writing and solving polynomial equations to solve problems
- Graphing and solving quadratic functions
- Comparing linear, exponential and quadratic models

**Enduring Understandings:** Students will understand:

- Apply exponent properties involving products and quotients
- Define and use negative and zero exponents
- Use scientific notation
- Write and graph exponential growth and decay functions
- Add, subtract, multiply and factor polynomials
- Find special products of polynomials
- Solve polynomial equations in factored form
- Graph and solve quadratic equations
- Use square roots to solve quadratic equations
- Solve quadratic equations by completing the square and the quadratic formula
- Interpret the discriminant
- Compare linear exponential and quadratic models

### Essential Questions:

- How do you use properties of exponents involving products and quotients?
- How do you use zero and negative exponents?
- How do you write a number in scientific notation?
- How do you write and graph equations for exponential growth and decay functions?
- How do you add, subtract, multiply and factor polynomials?
- How do you use special product patterns to multiply binomials?
- How do you solve polynomial equations in factored form?
- How do you graph and solve a quadratic function?
- How do you solve a quadratic equation by finding square roots, completing the square and using the quadratic formula?
- How do you use the value of the discriminant?
- How do you decide whether a linear, exponential, or quadratic model best represents data?

**Acquired Knowledge:** After studying the material of this unit, the students should be able to:

- Properties of exponents
- Define quadratic equation
- Complete the square
- Identify polynomials
- Identify the discriminant

**Acquired Skills:** After studying the material of this unit, the student should be able to:

- Apply the properties of exponents
- Solve quadratic equations through various methods
- Add, subtract, multiply and factor polynomials
- Graph quadratic functions
- Represent exponential growth and decay functions
- Write numbers in scientific notation

**Differentiation:**

Enrichment:

- Add enrichment activities
  - "Define and Use Fractional Exponents"
  - "Relate Geometric Sequences to Exponential Functions"
  - "Graph Quadratic Functions in Intercept Form"
  - "Graph Quadratic Functions in Vertex Form"

Supplement:

- Exponent Project
- Polynomial Project
- Scientific Notation Game
- Exponent War
- Exponential Growth Metaphors
- Pass It On…
- I'm Puzzled

**Assessments:**

Formative Assessments:

- Assessment Checklist for Graphing Exponential Functions
- Assessment Checklist for Adding, subtracting, multiplying and factoring polynomials
- Assessment Checklist for Solving Quadratic Equations
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- Chapter Assessments

Benchmarks

- Exponential and Quadratic Functions Assessment

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

**List of Applicable New Jersey Student Learning Standards Covered in This Unit:**

NJSLS. A-SSE.2-3
NJSLS. A-CED.2-4
NJSLS. F-IF.7
NJSLS. F-LE.1-2,5
NJSLS.MP.1-8

**Suggested Learning Experiences and Instructional Activities:**

<u>Anticipatory Sets:</u>

- Compare magnitudes of earthquakes
- Compare lengths of insects
- Find the value of a collector car
- Determine areas of rooms in our high school
- Solving problems about snowboarding, gymnastics and other sports

In-Class Activities:

- Exponential Property Activity
- Exponential Growth and Decay Experiment
- Quadratic Project
- Jeopardy

Websites:

- Virtual Manipulatives http://nlvm.usu.edu/en/nav/category_g_4_t_2.html

## Unit 4: Radicals and Rational Functions (20 Days)

### Why Is This Unit Important?

This unit will serve to develop the basic understanding radicals and rational functions and help students to apply real world application of probability. The big ideas embedded through this unit are:

- Graphing square root functions
- Using properties of radicals in expressions and equations
- Working with radical s in geometry
- Graphing and solving rational functions
- Performing operations on rational functions
- Finding probability of compound and simple events
- Analyzing and interpreting sets of data and data displays

**Enduring Understandings:** Students will understand:

- Graph square root functions
- Simplify and solve radical expressions
- Apply the Pythagorean Theorem and its converse
- Apply the distant and midpoint formulas
- Model inverse variation
- Graph rational functions
- Divide polynomials
- Simplify, solve, multiply, add, and subtract rational expressions
- Find probability and odds
- Find probability using permutations and combinations
- Find probability of compound events
- Analyze surveys and samples
- Use measures of central tendency and dispersion
- Interpret stem-and-leave plots, histograms, and box-and-whisker plots

**Essential Questions:**

- How do graph square root functions?
- How do you simplify and solve radical expressions?
- How do you use the Pythagorean Theorem and its converse?
- How do you use distance and midpoint formulas?
- How do you graph and solve inverse variation equations?
- How do you graph a rational function?
- How do you divide polynomials?
- How do you simplify, solve, multiply, add, and subtract rational expressions?
- How do you find probability of an event?
- How do you use the formula for permutations and combinations?
- How do you find the probability of compound events?
- How do you identify the populations and sampling methods of events?
- How do you compare measures of central tendency and dispersions?
- How do you make stem-and-leaf plots, histograms, and box-and-whisker plots?

**Acquired Knowledge:** After studying the material of this unit, the students should be able to:

- Identify and state the Pythagorean Theorem
- Define the different types of sampling methods
- Define probability
- Describe the difference between permutations and combinations
- Read stem-and-leaf, histograms, and box-and-whisker plots
- Identify and state the distance and midpoint formulas

**Acquired Skills:** After studying the material of this unit, the student should be able to:

- Graph rational functions
- Divide polynomials
- Find the probability of an event
- Use permutations and combinations
- Create and use stem-and-leaf plots, histograms, and box-and-whisker plots
- Solve square root functions

**Differentiation:**

<u>Enrichment</u>:

- Add enrichment activities
  - "Derive the Quadratic Formula"
  - "Dividing Polynomials Using Algebra Tiles"
  - "Find Asymptotes of Graphs"
  - "Simplify Complex Fractions"
  - "Perform Simulations"
  - "Calculate Variance and Standard Deviation"

Supplement:

- Pythagorean Theorem Activity
- Probability Project
- Distance and Midpoint Activity
- Jeopardy Review Game
- Coins, Dice, & Inequalities, Oh My!
- Flippin' Out
- Pick 10

**Assessments:**

Formative Assessments:

- Assessment Checklist for Simplify and solve radical expressions
- Assessment Checklist for Graphing rational functions
- Assessment Checklist for Measures of Central Tendency
- Teacher's observation of students at work; anecdotal records
- Individual conferences and group discussions
- Students' recording sheets

Summative Assessments:

- Teacher's observation of students at work
- Individual conferences
- Chapter Assessments

Benchmarks

- Radicals and Rational Functions Assessment

Alternative Assessments:

- Modified tasks and assessment rubrics
- Performance-based assessment tasks

**List of Applicable New Jersey Student Learning Standards Covered in This Unit:**

NJSLS. A-APR.6-7
NJSLS. A-CED.2-4
NJSLS. A-REI.2
NJSLS. F-IF.7
NJSLS.MP.1-8

**Suggested Learning Experiences and Instructional Activities:**

Anticipatory Sets:

- Analyze the speed of an athlete
- Describe football data
- Calculate hockey statistics
- Find the likelihood of an event
- Find the number of arrangements of student desks in a classroom
- Analyze surveys of sports fans
- Find the probability of hitting the lottery

In-Class Activities:

- Pythagorean Theorem Activity
- Flippin' Out
- Pick 10
- Distance and Midpoint Activity
- Coin Toss Probability
- Dice Roll Activity
- Spinner Activity
- Permutations between students
- Marbles Out of a Bag Activity

Websites:

- Virtual Manipulatives http://nlvm.usu.edu/en/nav/category_g_4_t_2.html

**Examples of Accommodations**:

- Enrichment – In unit 1 students are given modified problems, students are involved in rubric design and the following extension activities:
    - Determine Whether a Relation Is a Function
    - Perform Matrix Addition, Subtraction and Scalar Multiplication
    - Apply Proportions to Similar Figures
    - Find Percent of Change
- Supplement – In unit 1 students are given modified problems, scaffolded rubrics and the following supplemental activities:
    - Math Career Exploration Project - Brochure
    - Human Number Line
    - Scavenger Hunt
    - Find Someone Who…
    - Four Corners Rotation
    - Order of Operations Game
    - Inequality Activity

**Sample Standards Integration**

**21st Century Skills & Career Readiness Practices**

**Career Readiness:**

- In unit 3 students skype with engineers. They discuss the use of algebra in their work. They discuss the courses in high school and the courses and majors in college which are needed to enter into their career successfully.

**CRP4. Communicate clearly and effectively and with reason.**

For example, in Unit 1 students will justify their reasoning in their choice of solution pathways involving inequality scenarios

**CRP6. Demonstrate creativity and innovation.**

For example, in Unit 5 students will use geometric techniques to solve real world complex volume problems.

**CRP7. Employ valid and reliable research strategies.**

For example, in Unit 3 students will analyze and interpret growth and decay functions.

**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**

For example, in Unit 2 students will work to solve and understand real world applications utilizing their understanding of linear systems.

**CRP12. Work productively in teams while using cultural global competence.**

For example, in Unit 4 students will work in small teams to develop informal arguments for their solutions to probability scenarios.

**8.1 Educational Technology**

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

For example, in Unit 2 students will access, manage, evaluate, and synthesize information to develop models for graphical representations.

**NJSLS 8.1.12.A.4: Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.**

In unit 4 students work collaboratively to construct a spreadsheet workbook with multiple worksheets charting and analyzing data collected from 3 sports chosen by the student groups.

**Interdisciplinary Connections**

SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with peers on *grades 9–10 topics, texts, and issues,* building on others' ideas and expressing their own clearly and persuasively.

A. Come to discussions prepared having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
B. Collaborate with peers to set rules for discussions (e.g. informal consensus, taking votes on key issues, presentation of alternate views); develop clear goals and assessment criteria (e.g. student developed rubric) and assign individual roles as needed.
C. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
D. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.

SL.9-10.3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any false reasoning or distorted evidence.

SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience

These standards are met throughout the course. For example, in Unit 4 students will discuss their solutions to a variety of real world scenarios involving probability.