

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT

Content Area: Mathematics

Course Title: Fundamentals of Algebra

Grade Level: 9

Unit Plan 1
Expressions, Equations & Inequalities

Pacing Guide
5 weeks

Unit Plan 2
Factors, Fractions and Exponents

Pacing Guide
4 weeks

Unit Plan 3
Ratios, Proportions and Percents

Pacing Guide
3 weeks

Unit Plan 4
Data Analysis and Probability

Pacing Guide
5 weeks

Unit Plan 5
Multistep Equations & Inequalities

Pacing Guide
8 weeks

Unit Plan 6
Functions and Graphing

Pacing Guide
9 weeks

Date Created: February 2012

Board Approved on: March 14, 2012

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview**

Content Area: Mathematics

Unit Title: Expressions, Equations and Inequalities (Ch. 1-3)

Target Course/Grade Level: Fundamentals of Algebra / 9

Unit Summary

In this unit, the basic language of algebra is introduced. Students learn to represent unknown quantities with variables and to write numerical and variable expressions. Students learn the order of operations to simplify and evaluate numerical expressions. Students learn to represent, graph, and order integers, as well as find absolute values. They simplify expressions containing integers using all four mathematical operations, both with and without a calculator. Furthermore, students explore coordinate planes by naming coordinates, identifying quadrants and graphing points.

Also in this unit is the introduction of the basic algebraic properties needed to solve equations and inequalities. Students learn to solve one-step equations and inequalities by applying inverse operations using the Addition and Multiplication Properties of Equality. Students will also learn to graph inequalities and to identify inequalities by looking at graphs. (These topics will all be elaborated upon when revisited in Unit 4: Multi-step Equations and Inequalities.) Lastly, students will study decimals within one step equations and inequalities.

Primary interdisciplinary connections:

Infused within the unit is connection to the 2009 NJCCCS for Science, Language Arts Literacy and Technology.

21st Century Themes:

The unit will integrate the 21st Century Life and Career strand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:

For further clarification refer to NJ Class Standard Introductions at:

<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

Seeing Structure in Expressions A-SSE

Interpret the structure of expressions

1. Interpret expressions that represent a quantity in terms of its context. ★
 - a. Interpret parts of an expression, such as terms, factors, and coefficients.

Creating Equations★ A-CED

Create equations that describe numbers or relationships

1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

Reasoning with Equations and Inequalities A-REI

1. Understand solving equations as a process of reasoning and explain the reasoning
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.

Solve equations and inequalities in one variable

3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

CONTENT STANDARDS LINK: <http://www.corestandards.org/the-standards/mathematics/>

Unit Essential Questions

- How can we use variables in algebraic expressions to represent real-life situations?
- What is the correct order of operations to simplify an expression?
- How do we add, subtract, multiply and divide integers?
- How can equations and inequalities be used to solve real-life problems?

Unit Enduring Understandings

Students will understand that...

- Algebra can be utilized to represent real-life situations and expand the ability to solve problems.
- Algebra is related to arithmetic and can be used to generalize number patterns and computations.
- Algebraic concepts and processes can be used to concisely express, analyze and model real life situations.

Unit Objectives

Students will know...

- Algebraic expressions and variables in real life situations.
- Order of Operations.
- Absolute Value.
- Integer Operations.
- Coordinate plane, ordered pairs, quadrants.
- Distributive Property.
- Like terms.
- One step equations & inequalities.
- Inverse Operations.

Unit Objectives

Students will be able to...

- Write, simplify and evaluate variable expressions.
- Use order of operations to simplify expressions.
- Translate verbal phrases into variable expressions.
- Perform operations with integers.
- Graph points in the coordinate plane.
- Solve problems by looking for a pattern.
- Use the Distributive Property to simplify expressions.
- Write and solve one-step linear equations.
- Write, solve and graph one step linear inequalities in one variable.

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning**

Formative Assessments

For additional ideas please refer to NJ State DOE classroom application documents:

<http://www.state.nj.us/education/cccs/>

- Homework
- Classwork
- Teacher Observation
- Group participation
- DO-NOW
- Notebook assessment
- Open-Ended Writing Assignments
- Class Discussions

Summative Assessments

For additional ideas please refer to NJ State Academic website:

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- Chapter/Unit Test
- Open-Ended Writing Assignments
- Take Home Tests (spiral review)
- Unit Projects and Demonstrations
- Quarterlies and Final Exams

Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook and Textbook Resources
- Graphing Calculator and/or Scientific Calculator
- Mathematics Websites, including Interactive Textbook

Teacher Notes:

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview**

Content Area: Mathematics

Unit Title: Factors, Fractions and Exponents (Ch. 4-5)

Target Course/Grade Level: Fundamentals of Algebra / 9

Unit Summary

In this unit, students will use divisibility rules to find factors. They will apply these rules to prime factorization, greatest common factor and the simplification of both numeric and algebraic fractions. Students will also study exponents and learn how to multiply and divide expressions containing powers with the same base. Then use these concepts to find powers of products and quotients, in addition to writing and using numbers in scientific notation.

Also in this unit students build on their knowledge of fractions to compare and order fractions, and then to perform operations with fractions. These skills are applied to solve equations by adding, subtracting and multiplying fractions. Students will also recognize the difference between rational and irrational numbers.

Primary interdisciplinary connections:

Infused within the unit is connection to the 2009 NJCCCS for Science, Language Arts Literacy and Technology.

21st Century Themes:

The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:

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Learning Targets

Content Standards

The Real Number System N-RN

Use properties of rational and irrational numbers.

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.

Seeing Structure in Expressions A-SSE

Write expressions in equivalent forms to solve problems

3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

CONTENT STANDARDS LINK: <http://www.corestandards.org/the-standards/mathematics/>

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • How do you apply basic fractional knowledge to algebraic fractional operations? • Why is it useful to write a fraction in simplest form? • How can you determine the sets to which a number belongs? • What is the difference between rational and irrational numbers? • How can exponential form and scientific notation concisely represent an algebraic expression written in standard notation? 	<p>Unit Enduring Understandings</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Properties of rational number operations can be applied to solving real world mathematical problems. • Basic fractional knowledge can be applied to algebraic fractional operations. • Rational numbers and numerical expressions can be written in a variety of form. • Certain forms of a number are more suited to represent real-life situations and solve real-world problems.
<p>Unit Objectives</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Prime factorization. • Divisibility rules. • Numeric and algebraic fractions. • Simplest form. • Equations with fractions. • Real numbers. • Rational vs. Irrational numbers. • Exponential form and standard notation. • Scientific notation. • Multiplication & division properties of exponents. 	<p>Unit Objectives</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Use divisibility tests to determine factors. • Calculate factors, common factors, and the greatest common factor for a set of expressions. • Calculate multiples, common multiples, and the least common multiple for a set of expressions. • Simplify numeric and algebraic fractions. • Perform operations with fractions. • Simplify expressions with exponents. • Find powers of products and quotients. • Write and calculate in scientific notation. • Solve equations with fractions. • Compare, order and convert rational numbers. • Determine to which set(s) a number belongs.

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning**

Formative Assessments

For additional ideas please refer to NJ State DOE classroom application documents:

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- Homework
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- Peer tutoring
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- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook and Textbook Resources
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Teacher Notes:

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview**

Content Area: Mathematics

Unit Title: Ratios, Proportions and Percents (Ch. 6)

Target Course/Grade Level: Fundamentals of Algebra / 9

Unit Summary

In this unit students will learn the definitions and uses of ratios, rates and unit rates. Students will solve applications related to proportional representation, including measurement problems involving scale factor. Students solve percent problems with proportions and with equations. They will also learn about percents to find percent of change, markup and discount.

Primary interdisciplinary connections:

Infused within the unit is connection to the 2009 NJCCCS for Science, Language Arts Literacy and Technology.

21st Century Themes:

The unit will integrate the 21st Century Life and Career strand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:

For further clarification refer to NJ Class Standard Introductions at:

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Learning Targets

Content Standards

Quantities★ N-Q

Reason quantitatively and use units to solve problems.

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.

Creating Equations★ A-CED

Create equations that describe numbers or relationships

1. Create equations and inequalities in one variable and use them to solve problems.

CONTENT STANDARDS LINK: <http://www.corestandards.org/the-standards/mathematics/>

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • How are rates and unit rates calculated? • What methods can be used to solve percent word problems and how can the most efficient method be chosen? • How can proportional relationships be used to solve real life problems? 	<p>Unit Enduring Understandings</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Algebraic concepts and processes can be used to solve real life problems involving ratio, proportion and percent. • Decisions and predictions are often based on data. • To become a knowledgeable consumer and productive member in society, the study of proportion and percent applications is essential.
<p>Unit Objectives</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Ratio, rates and unit rates. • Proportional reasoning. • Percent proportions and percent equations. • Markup and discount. • Percent of change. 	<p>Unit Objectives</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Find and use ratios and unit rates. • Write and solve proportions. • Analyze proportional relationships and use them to solve real-world mathematical problems. • Find and use percents. • Write and solve percent equations.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments

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Summative Assessments

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- Modified assignments
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Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Data Analysis and Probability (Ch. 12, 3.3)

Target Course/Grade Level: Fundamentals of Algebra / 9

Unit Summary

Students use measures of central tendency to describe data. Students will display one variable data in different forms and learn how graphs can be persuasive. Students will learn how to count outcomes, find probabilities for independent and dependent events and basic permutations. They will also evaluate sampling plans for surveys and make estimates about populations.

Primary interdisciplinary connections:

Infused within the unit is connection to the 2009 NJCCCS for Science, Language Arts Literacy and Technology.

21st Century Themes:

The unit will integrate the 21st Century Life and Career strand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:

For further clarification refer to NJ Class Standard Introductions at:

<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

Quantities★ N-Q

Reason quantitatively and use units to solve problems.

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.

Interpreting Categorical and Quantitative data S-ID

Summarize, represent, and interpret data on a single count or measurement variable

1. Represent data with plots on the real number line (dot plots, histograms, and box plots).
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.
3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

Making Inferences and Justifying Conclusions S-IC

Understand and evaluate random processes underlying statistical experiments

1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using

simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of five tails in a row cause you to question the model? Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

Conditional Probability and the Rules of Probability S-CP

Understand independence and conditional probability and use them to interpret data

1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

CONTENT STANDARDS LINK: <http://www.corestandards.org/the-standards/mathematics/>

Unit Essential Questions

- In what ways can measures of central tendency and data displays be used to inform, mislead or persuade?
- How can probability calculations be used to make informed decisions and predictions in real life?
- How can a sample be chosen to represent a population?

Unit Enduring Understandings

Students will understand that...

- Decisions and predictions are often based on data.
- Statistics provide tools for describing variability in data and for making informed decisions.
- Probability calculations and counting techniques can be used to make informed decisions and predictions in real life.

Unit Objectives

Students will know...

- Measures of Central Tendency.
- Data displays (frequency table, line plot, histogram, box plot).
- Outlier, Quartile.
- Theoretical and Experimental Probability.
- Independent and Dependent events.
- Counting Principle and Tree Diagrams.
- Permutations.
- Sample spaces.
- Random samples of a population.

Unit Objectives

Students will be able to...

- Calculate the mean, median, mode and range of a data set.
- Choose the measure of central tendency that best describes a real-life situation.
- Use graphs to represent one variable data.
- Find theoretical and experimental probabilities.
- Calculate probabilities of independent and dependent events.
- Calculate the possible outcomes in a sample space.
- To choose a sample for a survey of a population.
- To make estimates about populations.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Multistep Equations and Inequalities (Ch. 7)

Target Course/Grade Level: Fundamentals of Algebra / 9

Unit Summary

In this unit, students will learn to solve two-step equations, multi-step equations, and multi-step inequalities. Multi-step equations include equations with fractions and decimals and equations with variables on both sides of the equal sign. Students will learn strategies in solving equations, which include looking ahead for productive manipulations and anticipating the nature and number of solutions. Students will be able to write equivalent equations in order to eliminate fractions and/or decimals from the equation for ease in solving. Identity equations and equations with no solution within a given number system will also be explored.

Primary interdisciplinary connections:

Infused within the unit is connection to the 2009 NJCCCS for Science, Language Arts Literacy and Technology.

21st Century Themes:

The unit will integrate the 21st Century Life and Career strand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:

For further clarification refer to NJ Class Standard Introductions at:

<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

Creating Equations★ A-CED

Create equations that describe numbers or relationships

1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .

Reasoning with Equations and Inequalities A-REI

Understand solving equations as a process of reasoning and explain the reasoning

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. Solve equations and inequalities in one variable.
3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Reasoning with Equations and Inequalities A-REI

Represent and solve equations and inequalities graphically

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. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★

CONTENT STANDARDS LINK: <http://www.corestandards.org/the-standards/mathematics/>

Unit Essential Questions

- How can equations and inequalities be used to solve real-life problems?
- How can equivalent equations be written to simplify the equation solving process?
- Why is it necessary to check the solutions of equations?
- What is the difference between simple and compound interest?

Unit Enduring Understandings

Students will understand that...

- Algebraic manipulations are governed by the properties of operations and exponents and the conventions of algebraic notation.
- There is more than one way to solve a problem.
- Algebra can be utilized to represent real-life situations and expand the ability to solve problems
- Algebraic concepts and processes can be used to concisely express, analyze and model real life situations.

Unit Objectives

Students will know...

- Solving Two-step and Multi-step equations.
- Multi-step equations with fractions/decimals.
- Equivalent equations.
- Identity.
- Multi-step inequalities.
- Graphing compound inequalities.
- Literal equations.
- Simple and compound interest.

Unit Objectives

Students will be able to...

- Write and solve two-step equations.
- Write and solve multi-step equations, including equations with variables on both sides.
- Write equivalent equations (to clear equations of fractions and/or decimals).
- Check solutions to equations.
- Write and solve two step inequalities.
- Graph basic compound inequalities (and & or).
- Solve word problems by writing equations.
- Solve literal equations for a given variable.
- Calculate simple and compound interest.

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning**

Formative Assessments

For additional ideas please refer to NJ State DOE classroom application documents:

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- Homework
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Summative Assessments

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Modifications (ELLs, Special Education, Gifted and Talented)

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Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Functions and Graphing (Ch. 8, 13.1-13.3)

Target Course/Grade Level: Fundamentals of Algebra / 9

Unit Summary

In this unit, students identify relations and functions and then graph linear equations. Students graph lines by first plotting points and then using the slope and y-intercept. They use their graphing knowledge to find trends and make predictions from scatter plots. Students also solve systems of linear equations and inequalities by graphing.

Students will also be introduced to non-linear functions. Students will graph quadratic and absolute value functions using a table of values and with the graphing calculator as a technological tool. In addition, students will model exponential growth and decay using tables, rules and graphs.

Primary interdisciplinary connections:

Infused within the unit are connection to the 2009 NJCCCS for Science, Language Arts Literacy and Technology.

21st Century Themes:

The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:

For further clarification refer to NJ Class Standard Introductions at:

<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

Quantities★ N-Q

Reason quantitatively and use units to solve problems.

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.

Seeing Structure in Expressions A-SSE

Write expressions in equivalent forms to solve problems

3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

Creating Equations★ A-CED

Create equations that describe numbers or relationships

2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

Reasoning with Equations and Inequalities A-REI

Solve systems of equations

6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.

Represent and solve equations and inequalities graphically

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).
12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the 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.

Interpreting Functions F-IF

Understand the concept of a function and use function notation

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 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 $y = f(x)$.
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Interpret functions that arise in applications in terms of the context

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.*★
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.*★
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.

Analyze functions using different representations

7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
★

CONTENT STANDARDS LINK: <http://www.corestandards.org/the-standards/mathematics/>

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • How are functions defined, evaluated and compared? • How is it determined whether a relation is a function? • How can a verbal description be converted to an equation, inequality or system? • How can a table of values be used to graph both linear and non-linear functions? • How can slope-intercept form be used to graph a linear equation? • How can graphs be used to solve real world problems? • What is the difference between a linear equation and an exponential equation? 	<p>Unit Enduring Understandings</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Functions can be used to model relationships between quantities. • Linear models show constant change in which one quantity changes at a constant rate per unit interval relative to another; exponential models show growth or decay by a constant percent rate per unit interval relative to another.
<p>Unit Objectives</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Functions and relations. • Domain and range. • Vertical line test. • Slope of a line. • Slope-intercept form of a linear equation. • Scatter plots. • Estimate trend line/line of best fit equation. • Types of correlation/trend. • Systems of linear equations by graphing. • Linear inequalities in two variables. • Non-linear graphing. 	<p>Unit Objectives</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Determine whether a relation is a function. • Use the vertical line test to determine a function. • Graph linear equations using a table of values. • Graph linear equations using slope-intercept form. • Describe the effects of varying the parameters m and b in linear functions of the form $f(x) = mx + b$ • Calculate slope using the slope formula & graph. • Solve systems of linear equations by graphing only. • Graph linear inequalities in two variables. • Write a function rule by analyzing a table or graph. • Graph non-linear functions using a table of values and graphing calculator. • Recognize whether a graph represents a linear, quadratic, absolute value or exponential function.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments

For additional ideas please refer to NJ State DOE classroom application documents:

<http://www.state.nj.us/education/cccs/>

- Homework
- Classwork
- Teacher Observation
- Group participation
- DO-NOW
- Notebook assessment
- Open-Ended Writing Assignments
- Class Discussions

Summative Assessments

For additional ideas please refer to NJ State Academic website:

<http://www.state.nj.us/education/cccs/>

- Chapter/Unit Test
- Open-Ended Writing Assignments
- Take Home Tests (spiral review)
- Unit Projects and Demonstrations
- Quarterlies and Final Exams

Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook and Textbook Resources
- Graphing Calculator and/or Scientific Calculator
- Mathematics Websites, including Interactive Textbook