

Curriculum Map: Pre-Algebra 2019

Course: PRE-ALGEBRA Sub-topic: Algebra

Grade(s): 6 to 9

Course

- *Students in this level will exhibit the following:*

Description:

Construct viable arguments and critique the reasoning of others

- Construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.)
- Refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students
- Pose questions like "How did you get that?", "Why is that true?", "Does that always work?"
- Explain their thinking to others and respond to others' thinking

Model with mathematics

- Model problem situations symbolically, graphically, tabularly, and contextually
- Form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations
- Solve systems of linear equations and compare properties of function provided in different forms
- Use scatterplots to represent data and describe associations between variables
- Connect and explain the connections between the different representations
- Use all representations as appropriate to a problem context

Use appropriate tools strategically

- Consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful
- Translate a set of data given in tabular form to a graphical representation to compare it to another data set
- Draw pictures, use applets, or write equations to show the relationships between the angles created by a transversal

Attend to precision

- Continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning
- Use appropriate terminology when referring to the number system, functions, geometric figures and data displays

Look for and make use of structure

- Routinely seek patterns or structures to model and solve problems
- Apply properties to generate equivalent expressions and solve equations
- Examine patterns in tables and graphs to generate equations and describe relationships
- Experimentally verify the effects of transformations and describe them in terms of congruence and similarity

Look for and express regularity in repeated reasoning

- Use repeated reasoning to understand algorithms and make generalizations about patterns
- Use iterative processes to determine more precise rational approximations for irrational numbers
- Solve and model problems. They notice that the slope of a line and rate of change are the same value
- Flexibly make connections between covariance, rates, and representations showing the relationships between quantities

**Course
Textbooks,
Workbooks,
Materials
Citations:**

Prentice Hall Mathematics Course 3 Common Core

Unit: Rational Numbers and Irrational Numbers

Month: September

- Skills:**
1. Distinguish between rational and irrational numbers using their properties
 2. Convert a terminating or repeating decimal into a rational number
 3. Use rational approximations of irrational numbers to compare the size of irrational numbers

- Essential Questions:**
1. How is mathematics used to quantify, compare, represent, and model numbers?
 2. How can mathematics support effective communication?
 3. How are relationships represented mathematically?
 4. How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations?
 5. What does it mean to estimate or analyze numerical quantities?
 6. What makes a tool and/or strategy appropriate for a given task?
 7. How can patterns be used to describe relationships in mathematical situations?

- Content:**
1. Mathematical relationships among numbers can be represented, compared and communicated.
 2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.
 3. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.
 4. Patterns exhibit relationships that can be extended, described, and generalized.

Assessments: Chapter 1 Test, quizzes, tests and formative assessments

- Lessons:**
1. Mathematical relationships among numbers can be represented, compared and communicated.
 2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.
 3. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.
 4. Patterns exhibit relationships that can be extended, described, and generalized.

Vocabulary: Irrational numbers

Rational number
perfect squares
square roots

Resources: Prentice Hall Course 3 Mathematics Common Core

Vocabulary: RESOURCES

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.1.8.E.1 \(Advanced\)](#) Distinguish between rational and irrational numbers using their properties.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.A-N.1.1.1 \(Advanced\)](#) Determine whether a number is rational or irrational. For rational numbers, show that the decimal expansion terminates or repeats (limit repeating decimals to thousandths).

[M08.A-N.1.1.2 \(Advanced\)](#) Convert a terminating or repeating decimal to a rational number (limit repeating decimals to thousandths).

Alternate Eligible Content Code M08AN1.1.2a: Convert a fraction to a decimal up to the hundredths place

[M08.A-N.1.1.3 \(Advanced\)](#) Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144). Example: $\sqrt{5}$ is between 2 and 3 but closer to 2.

[M08.A-N.1.1.4 \(Advanced\)](#) Use rational approximations of irrational numbers to compare and order irrational numbers.

[M08.A-N.1.1.5 \(Advanced\)](#) Locate/identify rational and irrational numbers at their approximate locations on a number line.

Alternate Eligible Content Code M08AN1.1.5a: Locate a non-terminating decimal at its approximate location on the number line

(* standards consolidated from Topic level)

Topic: Lesson 1-Rational Numbers (E)

Minutes for Topic: 42

Core Lesson Description: Rational Numbers

Core Lesson Student Learning Objectives: SWBAT write equivalent fractions and decimals. SWBAT to define a rational number as having a terminating or repeating decimal.

Core Lesson Essential Questions: How do write equivalent fractions and decimals? (E)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.1.8.E.1 \(Advanced\)](#) Distinguish between rational and irrational numbers using their properties.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.A-N.1.1.1 \(Advanced\)](#) Determine whether a number is rational or irrational. For rational numbers, show that the decimal expansion terminates or repeats (limit repeating decimals to thousandths).

[M08.A-N.1.1.2 \(Advanced\)](#) Convert a terminating or repeating decimal to a rational number (limit repeating decimals to thousandths).

Alternate Eligible Content Code M08AN1.1.2a: Convert a fraction to a decimal up to the hundredths place

[M08.A-N.1.1.3 \(Advanced\)](#) Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144). Example: $\sqrt{5}$ is between 2 and 3 but closer to 2.

[M08.A-N.1.1.4 \(Advanced\)](#) Use rational approximations of irrational numbers to compare and order irrational numbers.

[M08.A-N.1.1.5 \(Advanced\)](#) Locate/identify rational and irrational numbers at their approximate locations on a number line.

Alternate Eligible Content Code M08AN1.1.5a: Locate a non-terminating decimal at its approximate location on the number line

Topic: Lesson 2-3--Irrational Numbers and Square Roots (I) and (C)

Minutes for Topic: 84

Core Lesson Description: Irrational numbers and square roots

Core Lesson Student Learning Objectives: SWBAT find and estimate square roots and to classify numbers as rational or irrational.

Core Lesson Essential Questions: How do find and estimate square roots? (I)
How do you know if a number is rational or irrational? (C)

Topic: Lesson 4-Cube Roots (E)

Minutes for Topic: 42

Core Lesson Description: Cube Roots

Core Lesson Student Learning Objectives: SWBAT find cube roots and solve cube root equations

Core Lesson Essential Questions: How do you find a cube root and solve equations with cube roots? (E)

Topic: Lesson 5-6-Review and Assessment (I)

Minutes for Topic: 84

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: What are rational numbers and how do I use them to solve equations? (I)

Unit: Expressions

Month: February

Skills: 1. Apply concepts of integer exponents to generate equivalent expressions

2. Use and evaluate square roots and cube roots to represent solutions to equations

Essential Questions:

1. How is mathematics used to quantify, compare, represent, and model numbers?

Content:

1. Mathematical relationships among numbers can be represented, compared and communicated

Assessments:

Chapter 2 Test, quizzes and formative assessments

Vocabulary:

Coefficient
Function

Resources:

Prentice Hall Course 3 Mathematics Common Core

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.2.8.B.1](#)
(Advanced)

Apply concepts of radicals and integer exponents to generate equivalent expressions.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.B-E.1.1.1](#)
(Advanced)

Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: $3^{12} \times 3^{15} = 3^{27} = (3^3)^9$

[M08.B-E.1.1.2](#)
(Advanced)

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of perfect squares (up to and including 122) and cube roots of perfect cubes (up to and including 53) without a calculator. Example: If $x^2 = 25$ then $x = \pm 5$.

Alternate Eligible Content Code M08BE1.1.2a: Identify the meaning of an exponent (limited to exponents of 2 and 3)

[M08.B-E.1.1.3](#)
(Advanced)

Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one number is than another. Example: Estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 and determine that the world population is more than 20 times larger than the United States' population.

[M08.B-E.1.1.4](#)
(Advanced)

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology (e.g., interpret 4.7EE9 displayed on a calculator as 4.7×10^9).

(* standards consolidated from Topic level)

Topic: Lesson 17-19-Simplifying Algebraic Expressions (E)

Minutes for Topic: 126

Core Lesson Description: Simplifying Algebraic Expressions

Core Lesson Student Learning Objectives: SWBAT use the distributive property to simplify algebraic expressions. SWBAT combine like terms to simplify algebraic expressions.

Core Lesson Essential Questions: How do you use the distributive property to simplify algebraic expressions? (E)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.2.8.B.1 \(Advanced\)](#) Apply concepts of radicals and integer exponents to generate equivalent expressions.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.B-E.1.1.1 \(Advanced\)](#) Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: $3 \cdot 12 \times 3 \sim 15 = 3 \cdot 3 = 9$

[M08.B-E.1.1.2 \(Advanced\)](#) Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of perfect squares (up to and including 122) and cube roots of perfect cubes (up to and including 53) without a calculator. Example: If $x^2 = 25$ then $x = \pm \sqrt{25}$.

Alternate Eligible Content Code M08BE1.1.2a: Identify the meaning of an exponent (limited to exponents of 2 and 3)

[M08.B-E.1.1.3 \(Advanced\)](#) Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one number is than another. Example: Estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 and determine that the world population is more than 20 times larger than the United States' population.

[M08.B-E.1.1.4 \(Advanced\)](#) Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology (e.g., interpret $4.7EE9$ displayed on a calculator as 4.7×10^9).

Topic: Lesson 54-Scientific Notation (E)

Minutes for Topic: 42

Core Lesson Description: Scientific Notation

Core Lesson Student Learning Objectives: SWBAT write numbers in both Standard Form and Scientific Notation. SWBAT write Scientific Notation using negative exponents for numbers less than 1.

Core Lesson Essential Questions: What is Scientific Notation and how do you use it to write large and small numbers? (E)

Topic: Lesson 55-56- Exponents and Multiplication (E)

Minutes for Topic: 84

Core Lesson Description: Exponents and Multiplication

Core Lesson Student Learning Objectives: SWBAT to identify the base of an exponent expression. SWBAT multiply powers with the same base.

**Core Lesson
Essential
Questions:** How do you use exponents to show repeated multiplication?(E)

Topic: Lesson 57-Multiplying with Scientific Notation (E)

Minutes for Topic: 42

**Core Lesson
Description:** Multiplying with scientific Notation

**Core Lesson
Student Learning
Objectives:** SWBAT multiply numbers written in scientific notation and choose appropriate units of measure.

**Core Lesson
Essential
Questions:** How do you multiply using Scientific Notation? (E)

Topic: Lesson 58-59-Exponents and Division (E)

Minutes for Topic: 84

**Core Lesson
Description:** Dividing with exponents

**Core Lesson
Student Learning
Objectives:** SWBAT divide powers with the same base and to simplify expressions with negative exponents. SWBAT will simplify expressions with a zero exponent.

**Core Lesson
Essential
Questions:** How do you divide powers with the same base and simplify expressions with negative exponents? (E) How do you simplify and expressions with an exponent = zero? (E)

Topic: Lesson 60-Dividing with Scientific Notation (E)

Minutes for Topic: 42

**Core Lesson
Student Learning
Objectives:** SWBAT divide and compare numbers written in scientific notation.

**Core Lesson
Essential
Questions:** How do you divide and compare numbers written in Scientific Notation? (E)

Topic: Lesson 61--Review and Assessment (I)

Minutes for Topic: 42

**Core Lesson
Description:** Review and Assessment

**Core Lesson
Essential
Questions:** How do you write numbers in Scientific Notation and do mathematical operations with numbers in Scientific Notation? (I)

Unit: Linear Equations

Month: October and January

- Skills:**
1. Analyze and describe linear relationships between two variables, using slope
 2. Make connections between slope, lines and linear equations
 3. Interpret solutions to a linear equation and systems of two linear equations

4. Analyze, model and solve linear equations
5. Analyze and solve pairs of simultaneous equations

Essential Questions:

1. How can mathematics support effective communication?
2. How are relationships represented mathematically?
3. How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?
4. How can data be organized and represented to provide insight into the relationship between quantities?
5. How does the type of data influence the choice of display?

Content:

1. Mathematical relationships among numbers can be represented, compared, and communicated
2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations
3. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions
4. Data can be modeled and used to make inferences

Assessments: Chapter 2 Test and Chapter 5 Test, Quizzes and formative assessments

Vocabulary:

Coefficient
Function
Line of best fit
Linear association
Linear equation
Negative correlation
Rate of change
Scatterplot
Simultaneous linear equations
Slope
y-intercept

Resources: Prentice Hall Course 3 Mathematics Common Core

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.2.8.B.2 \(Advanced\)](#) Understand the connections between proportional relationships, lines, and linear equations.

[CC.2.2.8.B.3 \(Advanced\)](#) Analyze and solve linear equations and pairs of simultaneous linear equations.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.B-E.2.1.1](#)
(Advanced)

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. Example: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Alternate Eligible Content Code M08BE2.1.1a: Compare two proportional relationships shown in graph form

[M08.B-E.2.1.2](#)
(Advanced)

Use similar right triangles to show and explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.

[M08.B-E.2.1.3](#)
(Advanced)

Derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

Alternate Eligible Content Code M08BE2.1.3a: Identify the slope and y -intercept of a line on a graph

[M08.B-E.3.1.1](#)
(Advanced)

Write and identify linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

Alternate Eligible Content Code M08BE3.1.1a: Select an algebraic equation using addition or subtraction to solve a 2-step real-world problem with one variable

[M08.B-E.3.1.2](#)
(Advanced)

Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Alternate Eligible Content Code M08BE3.1.2a: Solve a 2-step real-world problem using an algebraic equation involving addition or subtraction and one variable

[M08.B-E.3.1.3](#)
(Advanced)

Interpret solutions to a system of two linear equations in two variables as points of intersection of their graphs because points of intersection satisfy both equations simultaneously.

[M08.B-E.3.1.4](#)
(Advanced)

Solve systems of two linear equations in two variables algebraically and estimate solutions by graphing the equations. Solve simple cases by inspection. Example: $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

[M08.B-E.3.1.5](#)
(Advanced)

Solve real-world and mathematical problems leading to two linear equations in two variables. Example: Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Alternate Eligible Content Code M08BE3.1.5a: Graph a linear equation

(* standards consolidated from Topic level)

Topic: Lesson 15-16 Solving 2-Step Equations (E)

Minutes for Topic: 84

Core Lesson Description: Solving 2-Step Equations

Core Lesson

Student Learning SWBAT to write and solve 2-step equations.

Objectives:

Core Lesson

Essential

How do you solve 2-Step Equations? (E)

Questions:

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.2.8.B.2 \(Advanced\)](#) Understand the connections between proportional relationships, lines, and linear equations.

[CC.2.2.8.B.3 \(Advanced\)](#) Analyze and solve linear equations and pairs of simultaneous linear equations.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.B-E.2.1.1 \(Advanced\)](#) Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. Example: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Alternate Eligible Content Code M08BE2.1.1a: Compare two proportional relationships shown in graph form

[M08.B-E.2.1.2 \(Advanced\)](#) Use similar right triangles to show and explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.

[M08.B-E.2.1.3 \(Advanced\)](#) Derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

Alternate Eligible Content Code M08BE2.1.3a: Identify the slope and y -intercept of a line on a graph

[M08.B-E.3.1.1 \(Advanced\)](#) Write and identify linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

Alternate Eligible Content Code M08BE3.1.1a: Select an algebraic equation using addition or subtraction to solve a 2-step real-world problem with one variable

[M08.B-E.3.1.2 \(Advanced\)](#) Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Alternate Eligible Content Code M08BE3.1.2a: Solve a 2-step real-world problem using an algebraic equation involving addition or subtraction and one variable

[M08.B-E.3.1.3 \(Advanced\)](#) Interpret solutions to a system of two linear equations in two variables as points of intersection of their graphs because points of intersection satisfy both equations simultaneously.

[M08.B-E.3.1.4 \(Advanced\)](#) Solve systems of two linear equations in two variables algebraically and estimate solutions by graphing the equations. Solve simple cases by inspection. Example: $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

[M08.B-E.3.1.5 \(Advanced\)](#) Solve real-world and mathematical problems leading to two linear equations in two variables. Example: Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Alternate Eligible Content Code M08BE3.1.5a: Graph a linear equation

Topic: Lesson 20-21 Solving Multi-Step Equations (E)

Minutes for Topic: 84

Core Lesson

Description:

Solving multi-step equations

Core Lesson

Student Learning SWBAT write and solve multi-step equations

Objectives:

**Core Lesson
Essential
Questions:** How do you solve Multi-Step Equations? (E)

Topic: Lesson 22-23 Solving Equations with Variables on Both Sides (E)

Minutes for Topic: 84

**Core Lesson
Description:** Solving equations with variables on both sides of the equation

**Core Lesson
Student Learning
Objectives:** SWBAT write and solve equations with variables on both sides.

**Core Lesson
Essential
Questions:** How do you solve equations with variables on both sides of the equal sign? (E)

Topic: Lesson 25-26- Review and Assessment (I)

Minutes for Topic: 84

**Core Lesson
Description:** Review and Assessment

**Core Lesson
Essential
Questions:** How do you solve linear equations? (I)

Topic: Lesson 24-Types of Solutions of Linear Equations (I)

Minutes for Topic: 42

**Core Lesson
Description:** Different Types of Linear Equations

**Core Lesson
Student Learning
Objectives:** SWBAT identify whether a linear equation in one variable has one, infinitely many, or no solution. SWBAT to create examples of linear equations with infinitely many or no solution.

**Core Lesson
Essential
Questions:** How do identify whether an equation has one solution, no solution, or infinite solutions? (I)

Topic: Lesson 46-47-Solving Systems of Linear Equations by Graphing (E)

Minutes for Topic: 84

**Core Lesson
Description:** Solving Systems of Linear Equations by Graphing

**Core Lesson
Student Learning
Objectives:** SWBAT to solve systems of two linear equations in two variables by graphing the equation. SWBAT to check the solution of a linear system by inputting the ordered pair into both equations. SWBAT to identify the system of a linear system from a graph.

**Core Lesson
Essential
Questions:** How do you solve systems of two linear equations in two variables by graphing? How can you identify the solution of a linear system from a graph? (E)

Topic: Lesson 48-49-Solving Systems by Substitution (E)

Minutes for Topic: 84

**Core Lesson
Description:** Solving Linear systems using substitution

Core Lesson Student Learning Objectives: SWBAT to solve a system of linear equations by substitution and check their solution. SWBAT to write and solve problems by writing linear systems based on real-world scenarios.

Core Lesson Essential Questions: How do you write and solve a system of linear equations using substitution method? (E)

Topic: Lesson 50-51-Solving Linear Systems by Elimination (E)

Minutes for Topic: 84

Core Lesson Description: Solving Linear Systems using Elimination

Core Lesson Student Learning Objectives: SWBAT solve system of linear equations by elimination and check their solution. SWBAT to choose the best method for various real-world problems.

Core Lesson Essential Questions: How do you write and solve linear systems of equations using elimination method? (E)

Topic: Lesson 52-53-Review and Assessment (I)

Minutes for Topic: 84

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: How do you solve equations and systems of linear equations? (I)

Unit: Functions

Month: November/December

Skills:

1. Define, interpret and compare functions displayed algebraically, graphically, numerically in tables, or by verbal descriptions
2. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values

Essential Questions:

1. How is mathematics used to quantify, compare, represent, and model numbers?
2. How can mathematics support effective communication?
3. How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?
4. How can data be organized and represented to provide insight into the relationship between quantities?
5. How can probability and data analysis be used to make predictions?

Content:

1. Mathematical relationships among numbers can be represented, compared, and communicated
2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations

3. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions

4. Data can be modeled and used to make inferences

Assessments: Chapter 3 Test and Chapter 4 Test, quizzes and formative assessments

Vocabulary: Coefficient
Cube root
Function
Line of best fit
Linear association
Linear equation
Positive correlation
Rate of change
y-intercept

Resources: Prentice Hall Course 3 Mathematics Common Core

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.2.8.C.1 \(Advanced\)](#) Define, evaluate, and compare functions.

[CC.2.2.8.C.2 \(Advanced\)](#) Use concepts of functions to model relationships between quantities.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.B-F.1.1.1 \(Advanced\)](#) Determine whether a relation is a function.

[M08.B-F.1.1.2 \(Advanced\)](#) Compare properties of two functions, each represented in a different way (i.e., algebraically, graphically, numerically in tables, or by verbal descriptions). Example: Given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

[M08.B-F.1.1.3 \(Advanced\)](#) Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line; give examples of functions that are not linear.

[M08.B-F.2.1.1 \(Advanced\)](#) Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.

Alternate Eligible Content Code M08BF2.1.1a: Determine the missing value in a graph showing a real-world linear relationship

[M08.B-F.2.1.2 \(Advanced\)](#) Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch or determine a graph that exhibits the qualitative features of a function that has been described verbally.

Alternate Eligible Content Code M08BF2.1.2a: Describe the relationship between two variables with a linear relationship

displayed in graph form

(* standards consolidated from Topic level)

Topic: Lesson 27-Relating Graphs to Events (E)

Minutes for Topic: 42

Core Lesson Description: Relating graphs to real life events

Core Lesson Student Learning Objectives: SWBAT interpret and sketch graphs that represent real-world situations.

Core Lesson Essential Questions: How do you interpret and sketch graphs that represent real-life situations? (E)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.2.8.C.1 \(Advanced\)](#) Define, evaluate, and compare functions.

[CC.2.2.8.C.2 \(Advanced\)](#) Use concepts of functions to model relationships between quantities.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.B-F.1.1.1 \(Advanced\)](#) Determine whether a relation is a function.

[M08.B-F.1.1.2 \(Advanced\)](#) Compare properties of two functions, each represented in a different way (i.e., algebraically, graphically, numerically in tables, or by verbal descriptions). Example: Given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

[M08.B-F.1.1.3 \(Advanced\)](#) Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line; give examples of functions that are not linear.

[M08.B-F.2.1.1 \(Advanced\)](#) Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.

Alternate Eligible Content Code M08BF2.1.1a: Determine the missing value in a graph showing a real-world linear relationship

[M08.B-F.2.1.2 \(Advanced\)](#) Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch or determine a graph that exhibits the qualitative features of a function that has been described verbally.

Alternate Eligible Content Code M08BF2.1.2a: Describe the relationship between two variables with a linear relationship displayed in graph form

Topic: Lesson 28-Evaluating Functions (E)

Minutes for Topic: 42

Core Lesson Description: Evaluating Functions

Core Lesson Student Learning Objectives: SWBAT to use a function rule to generate a table of values. SWBAT complete input-output tables.

Core Lesson Essential Questions: How do you use a function rule to generate a table of values? (E)

Topic: Lesson 29-Proportional Relationships

Minutes for Topic: 42

Core Lesson Description: Proportional Relationships

Core Lesson Student Learning Objectives: SWBAT determine if relationships are proportional from a graph or a table.

Core Lesson Essential Questions: How do you determine whether a graph or table represents a proportional relationship? (E)

Topic: Lessons 30-31-Linear Functions (E)

Minutes for Topic: 84

Core Lesson Description: Linear Functions

Core Lesson Student Learning Objectives: SWBAT recognize linear functions from graphs or tables. SWBAT graph linear functions from a table.

Core Lesson Essential Questions: How do you decide if a function is linear by looking at a graph or a table?(I) How do you graph linear functions? (E)

Topic: Lesson 32- Nonlinear Functions (I)

Minutes for Topic: 42

Core Lesson Description: Non-linear functions

Core Lesson Student Learning Objectives: SWBAT identify nonlinear functions from graphs and tables.

Core Lesson Essential Questions: How do you identify linear and non-linear functions ? (I)

Topic: Lesson 33-Review and Assessment (I)

Minutes for Topic: 42

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: Can you identify linear functions and proportional relationships from a table or graph? (I)

Topic: Lesson 34-36-Understanding Slope of a Line (E)

Minutes for Topic: 126

Core Lesson Description: Understand the slope of a line

Core Lesson Student Learning Objectives: SWBAT find the slope of a line from a graph, a table, or given 2 ordered pairs. SWBAT find the slopes of horizontal and Vertical lines

Core Lesson Essential Questions: What is SLOPE and how do you calculate it?(E)

Topic: Lesson 37-39-Graphing Linear Functions (E)

Minutes for Topic: 126

Core Lesson Description: Graphing Linear Functions

Core Lesson Student Learning Objectives: SWBAT use tables and equations to graph linear functions. SWBAT to identify the slope and the y-intercept of a line from the equation written in Slope Intercept Form. SWBAT graph an equation that is written in Slope Intercept Form.

Core Lesson Essential Questions: How do you identify the slope and y-intercept of a line from the equation written in Slope Intercept Form? (E) How do you graph an equation that is written in slope-intercept form?(E)

Topic: Lesson 40-42-Writing Rules for Linear Functions (I)

Minutes for Topic: 126

Core Lesson Description: Writing Rules for Linear Functions

Core Lesson Student Learning Objectives: SWBAT write function rules from words, tables, and graphs.

Core Lesson Essential Questions: How do you identify a function rule from words, graphs or tables? (I)

Topic: Lesson 43-Comparing Linear Functions (I)

Minutes for Topic: 42

Core Lesson Description: Compare linear functions

Core Lesson Student Learning Objectives: SWBAT to compare properties of two functions represented in different ways.

Core Lesson Essential Questions: How do you compare the properties of two functions represented in different ways? (I)

Topic: Lesson 44-45 Review and Assessment (I)

Minutes for Topic: 84

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: How do you calculate slope and use it to graph equations? (I)

Unit: Cylinders, Cones and Sphere

Month: March

Skills: 1. Apply concepts of volume of cylinders, cones and spheres to solve real-world and mathematical problems

Essential 1. How can patterns be used to describe relationships in mathematical situations?

Questions:

2. How can recognizing repetition or regularity assist in solving problems more efficiently?
3. How are spatial relationships, including shape and dimension, used to draw, construct, model and represent real situations or solve problems?
4. How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?
5. How can geometric properties and theorems be used to describe, model and analyze situations?

Content:

1. Patterns exhibit relationships that can be extended, described, and generalized
2. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization

Assessments:

Chapter 9 Test, quizzes and formative assessments

Vocabulary:

cone
 Congruence
 Congruent figures
 Cube root
 Cylinder
 Sphere

Resources:

Prentice Hall Course 3 Mathematics Common Core

STANDARDS:**STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.3.8.A.1 \(Advanced\)](#)

Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.C-G.3.1.1 \(Advanced\)](#)

Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. Formulas will be provided.

Alternate Eligible Content Code M08CG.3.1.1a: Complete the formula for volume to solve a real-world or mathematical problem

(* standards consolidated from Topic level)

Topic: Lesson 85-Solids (I)

Minutes for Topic: 42

Core Lesson Description:

Geometric Solids

Core Lesson

Student Learning Objectives: SWBAT identify solids (prisms, pyramids, cylinders, and cones), parts of solids, and skew line segments

Core Lesson

Essential Questions: How do you identify prisms, pyramids, cylinders and cones? (I)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.3.8.A.1 \(Advanced\)](#) Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.C-G.3.1.1 \(Advanced\)](#) Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. Formulas will be provided.

Alternate Eligible Content Code M08CG.3.1.1a: Complete the formula for volume to solve a real-world or mathematical problem

Topic: Lesson 86-87-Volume of Prisms and Cylinders (E)

Minutes for Topic: 84

Core Lesson Description: Volume of Prisms and Cylinders

Core Lesson Student Learning Objectives: SWBAT find the volumes of prisms and cylinders.

Core Lesson Essential Questions: How do you find the volumes of prisms and cylinders? (E)

Topic: Lesson 88-89-Volumes of Pyramids and Cones (E)

Minutes for Topic: 84

Core Lesson Description: Volumes of Pyramids and Cones

Core Lesson Student Learning Objectives: SWBAT find the volumes of pyramids and cones.

Core Lesson Essential Questions: How do you find the volumes of pyramids and cones? (E)

Topic: Lesson 90-Review and Assessment (I)

Minutes for Topic: 42

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: How do you calculate the volumes of different solids? (I)

Topic: Lesson 91-92-Surface Area and Volume of Spheres (E)

Minutes for Topic: 84

Core Lesson Description: Surface Area and Volume of Spheres

Core Lesson Student Learning Objectives: SWBAT find the surface area and volume of a sphere.

Core Lesson

Essential Questions: How do you find the surface area and volume of spheres? (E)

Topic: Lesson 93-94- Review and Assessment (I)

Minutes for Topic: 84

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: How do you calculate volume? (I)

Unit: Congruence and Similarity

Month: January and February

- Skills:**
1. Use transformations to demonstrate congruence and similarity of geometric figures
 2. Use various tools to understand and apply geometric transformations to geometric figures

- Essential Questions:**
1. How can patterns be used to describe relationships in mathematical situations?
 2. How can recognizing repetition or regularity assist in solving problems more efficiently?
 3. How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?
 4. How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?
 5. How can geometric properties and theorems be used to describe, model and analyze situations?

- Content:**
1. Patterns exhibit relationships that can be extended, described, and generalized
 2. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization

Assessments: Chapter 8 Test, quizzes and formative assessments

Vocabulary: cone
Congruence
Congruent figures
Cylinder
Dilations
Reflection
Rotation
Scatterplot
Similarity
Slope

Sphere
Transformation
Translation
Two-way table

Resources: Prentice Hall Course 3 Mathematics Common Core

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.3.8.A.2 \(Advanced\)](#) Understand and apply congruence, similarity, and geometric transformations using various tools.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.C-G.1.1.1 \(Advanced\)](#) Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations.

Alternate Eligible Content Code M08CG1.1.1a: Identify a rotation, reflection, or translation of a two- or three-dimensional figure

[M08.C-G.1.1.2 \(Advanced\)](#) Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them.

Alternate Eligible Content Code M08CG1.1.2a: Identify figures that are congruent/similar

[M08.C-G.1.1.3 \(Advanced\)](#) Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

[M08.C-G.1.1.4 \(Advanced\)](#) Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.

(* standards consolidated from Topic level)

Topic: Lesson 62-Angles and Parallel Lines (E)

Minutes for Topic: 42

Core Lesson Description: Angles and Parallel Lines

Core Lesson Student Learning Objectives: SWBAT identify types of angles and to find angle measures using the relationship between angles. SWBAT identify parallel lines and the angles formed by parallel lines and transversals.

Core Lesson Essential Questions: How do you identify parallel lines and the angles formed by parallel lines and transversals? (E)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.3.8.A.2 \(Advanced\)](#) Understand and apply congruence, similarity, and geometric transformations using various tools.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.C-G.1.1.1 \(Advanced\)](#) Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations.

Alternate Eligible Content Code M08CG1.1.1a: Identify a rotation, reflection, or translation of a two- or three-dimensional figure

[M08.C-G.1.1.2 \(Advanced\)](#) Given two congruent figures, describe a sequence of transformations that exhibits

the congruence between them.

Alternate Eligible Content Code M08CG1.1.2a: Identify figures that are congruent/similar

[M08.C-G.1.1.3 \(Advanced\)](#) Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

[M08.C-G.1.1.4 \(Advanced\)](#) Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.

Topic: Lesson 63-Congruent Figures (E)

Minutes for Topic: 42

Core Lesson Description: Congruent Figures

Core Lesson Student Learning Objectives: SWBAT identify congruent figures and use them to solve problems. SWBAT show triangles are congruent by using corresponding parts.

Core Lesson Essential Questions: How do you identify congruent figures and use them to solve problems? (E)

Topic: Lesson 64-Review and Assessment (I)

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: What do you know about the angles formed when 2 lines are cut by a transversal? (I)

Topic: Lesson 65-66-Similar Figures (E)

Minutes for Topic: 84

Core Lesson Description: Similar Figures

Core Lesson Student Learning Objectives: SWBAT identify similar figures and to use proportions to find missing measurements in similar figures.

Core Lesson Essential Questions: What are the characteristics of similar figures and how do you use their proportionality to find missing measurements? (E)

Topic: Lesson 67-Proving Triangles Similar (I)

Minutes for Topic: 42

Core Lesson Description: Proving Triangles Similar

Core Lesson Student Learning Objectives: SWBAT determine measure of the angles of triangles and use them to prove that triangles are similar. SWBAT use Angle-Angle similarity to prove the similarity of two triangles.

Core Lesson Essential Questions: What is Angle Angle similarity and how do you use it to prove triangles are similar? (I)

Topic: Lesson 68-Slope and Similar Triangles (E)

Minutes for Topic: 42

Core Lesson Description: Slope and Similar Triangles

Core Lesson Student Learning Objectives: SWBAT use similar triangles to calculate the slope between any two distinct points on a line.

Core Lesson Essential Questions: How do you use similar triangles to find the slope of a line? (E)

Topic: Lesson 69-70-Angles and Polygons (E)

Minutes for Topic: 84

Core Lesson Description: Angles and Polygons

Core Lesson Student Learning Objectives: SWBAT find the angle measure of a polygon. SWBAT find the measure of an exterior angle. SWBAT use the Polygon Angle Sum formula to find the sum of the measures of the interior angles of a polygon.

Core Lesson Essential Questions: How do you find the angle measures of a polygon? (E)

Topic: Lesson 71-72-Review and Assessment (I)

Minutes for Topic: 84

Core Lesson Description: Review and Assessment

Core Lesson Student Learning Objectives: What do you know about angle measures and parallel lines? (I)

Topic: Lesson 73-74-Translations (E)

Minutes for Topic: 84

Core Lesson Description: Geometric Translations

Core Lesson Student Learning Objectives: SWBAT graph and describe translations in the coordinate plane.

Core Lesson Essential Questions: How do you graph a translations in the coordinate plane? (E)

Topic: Lessons 75-76-Reflections and Symmetry (E)

Minutes for Topic: 84

Core Lesson Description: Geometric reflections and symmetry

Core Lesson Student Learning Objectives: SWBAT graph reflections in the coordinate plane and to identify lines of symmetry.

Core Lesson Essential Questions: How do you graph reflections in the coordinate plane and identify symmetry? (E)

Topic: Lessons 77-78-Rotations (E)

Minutes for Topic: 84

Core Lesson Description: Geometric Rotations

Core Lesson Student Learning Objectives: SWBAT graph rotations and to identify rotational symmetry.

Core Lesson Essential Questions: What is rotational symmetry and how do you graph a rotation in a coordinate plane? (E)

Topic: Lesson 79-Transformations and Congruence (E)

Minutes for Topic: 42

Core Lesson Description: Geometric transformations and congruence

Core Lesson Student Learning Objectives: SWBAT describe a sequence of transformations that maps one figure onto another. SWBAT determine whether two figures are congruent by using a sequence of transformations.

Core Lesson Essential Questions: How can you use a sequence of transformations to prove congruency? (E)

Topic: Lesson 80-Dilations (E)

Minutes for Topic: 42

Core Lesson Description: Geometric dilations

Core Lesson Student Learning Objectives: SWBAT graph dilations and to determine the scale factor of a dilation.

Core Lesson Essential Questions: What is a scale factor and how can you use it to graph a dilation in the coordinate plane? (E)

Topic: Lesson 81-Transformations and Similarity (E)

Minutes for Topic: 42

Core Lesson Description: Geometric transformations and similarity

Core Lesson Student Learning Objectives: SWBAT describe a sequence of transformations that maps one figure onto a figure that is similar. SWBAT determine whether two figures are similar by using a sequence of transformations.

Core Lesson Essential Questions: What is similarity and how can you use a sequence of transformations to prove similarity? (E)

Topic: Lesson 82-84-Review and Assessment (I)

Minutes for Topic: 126

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: What do you know about transformations in the coordinate plane? (I)

Unit: Pythagorean Theorem

Month: September

Skills: 1. Apply the Pythagorean Theorem and its converse to solve mathematical problems in two and three dimensions

Essential Questions:

1. How can recognizing repetition or regularity assist in solving problems more efficiently?
2. How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?
3. How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?
4. How can geometric properties and theorems be used to describe, model and analyze situations?

Content:

1. Patterns exhibit relationships that can be extended, described, and generalized
2. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization

Assessments: Chapter 1 Test, quizzes and formative assessments

Vocabulary:

- Irrational numbers
- Perfect cube
- Perfect square
- Pythagorean theorem
- Rational number
- Square root
- Rational Numbers

Resources: Prentice Hall Course 3 Mathematics Common Core

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.3.8.A.3 \(Advanced\)](#) Understand and apply the Pythagorean Theorem to solve problems.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.C-G.2.1.1 \(Advanced\)](#) Apply the converse of the Pythagorean theorem to show a triangle is a right triangle.

[M08.C-G.2.1.2 \(Advanced\)](#) Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Figures provided for problems in three dimensions will be consistent with Eligible Content in grade 8 and below.)

Alternate Eligible Content Code M08CG2.1.2a: Apply the Pythagorean theorem to determine length/distance in a real-world problem

[M08.C-G.2.1.3](#) Apply the Pythagorean theorem to find the distance

[\(Advanced\)](#) between two points in a coordinate system.

(* standards consolidated from Topic level)

Topic: Lesson 7-9-Pythagorean Theorem-Finding Missing Measurements (E)

Minutes for Topic: 84

Core Lesson Description: Finding missing sides of a right triangle using the Pythagorean Theorem

Core Lesson Student Learning Objectives: SWBAT use the Pythagorean Theorem to find the length of a hypotenuse of a right triangle. SWBAT use the Pythagorean Theorem to find missing measurements of a right triangle.

Core Lesson Essential Questions: How do you use the Pythagorean Theorem to find the missing length of a right triangle's hypotenuse? (E)
How do you find missing lengths of a right triangle's legs? (E)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.3.8.A.3 \(Advanced\)](#) Understand and apply the Pythagorean Theorem to solve problems.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.C-G.2.1.1 \(Advanced\)](#) Apply the converse of the Pythagorean theorem to show a triangle is a right triangle.

[M08.C-G.2.1.2 \(Advanced\)](#) Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Figures provided for problems in three dimensions will be consistent with Eligible Content in grade 8 and below.)

Alternate Eligible Content Code M08CG2.1.2a: Apply the Pythagorean theorem to determine length/distance in a real-world problem

[M08.C-G.2.1.3 \(Advanced\)](#) Apply the Pythagorean theorem to find the distance between two points in a coordinate system.

Topic: Lessons 10-11-Converse of the Pythagorean Theorem (E)

Minutes for Topic: 84

Core Lesson Description: Converse of the Pythagorean Theorem

Core Lesson Student Learning Objectives: SWBAT solve problems using the Triangle Inequality Theorem and the Converse of the Pythagorean Theorem.

Core Lesson Essential Questions: How do you use the Triangle Inequality Theorem and the Converse of the Pythagorean Theorem? (E)

Topic: Lesson 12-Distance in the Coordinate Plane (I)

Minutes for Topic: 42

Core Lesson Description: Using the Pythagorean Theorem to find distance in the coordinate plane

Core Lesson Student Learning Objectives: SWBAT graph points and to use the Pythagorean Theorem to find distance in the coordinate plane. (I)

Core Lesson Essential Questions: How do you use the Pythagorean Theorem to find the distance between two points in the coordinate plane?

Topic: Lesson 13-14-Review and Assessment (I)

Minutes for Topic: 84

Core Lesson Description: Review and Assessment

Core Lesson Essential Questions: What is the Pythagorean Theorem and how do you use it find missing lengths?

Unit: Data and Distributions

Month: March and April

Skills:

1. Construct, analyze, and interpret bivariate data displayed in scatter plots
2. Identify and use linear models to describe bivariate measurement data
3. Use frequencies to analyze patterns of association seen in bivariate data

Essential Questions:

1. What does it mean to estimate or analyze numerical quantities?
2. What makes a tool and/or strategy appropriate for a given task?
3. How can data be organized and represented to provide insight into the relationship between quantities?
4. How does the type of data influence the choice of display?
5. How can probability and data analysis be used to make predictions?

Content:

1. Numerical quantities, calculations and measurements can be estimated or analyzed by using appropriate strategies and tools
2. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions
3. Data can be modeled and used to make inferences

Assessments: Chapter 10 Test, quizzes and formative assessments

Vocabulary:

- Bivariate data
- Clustering
- Coefficient
- Linear association
- Negative correlation
- Non-linear association
- Outlier
- Positive correlation
- Scatterplot

Translation
Two-way table
y-intercept

Resources: Prentice Hall Course 3 Mathematics Common Core

STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.4.8.B.1 \(Advanced\)](#) Analyze and/or interpret bivariate data displayed in multiple representations.

[CC.2.4.8.B.2 \(Advanced\)](#) Understand that patterns of association can be seen in bivariate data utilizing frequencies.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.D-S.1.1.1 \(Advanced\)](#) Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative correlation, linear association, and nonlinear association.

[M08.D-S.1.1.2 \(Advanced\)](#) For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.

Alternate Eligible Content Code M08DS1.1.2a: Identify a statement that describes the relationship between variables displayed in a scatterplot

[M08.D-S.1.1.3 \(Advanced\)](#) Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. Example: In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

[M08.D-S.1.2.1 \(Advanced\)](#) Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible associations between the two variables. Example: Given data on whether students have a curfew on school nights and whether they have assigned chores at home, is there evidence that those who have a curfew also tend to have chores?

Alternate Eligible Content Code M08DS1.2.1a: Answer a question using data from a two-way table

(* standards consolidated from Topic level)

Topic: Lesson 95-98-Scatter Plots (E)

Minutes for Topic: 168

Core Lesson Description: Scatter plots for bi-variate data

Core Lesson Student Learning Objectives: SWBAT create and interpret scatter plots of bivariate data.

Core Lesson Essential Questions: What are scatter plots and when do we use them? (E)

STANDARDS

STATE: PA Core Standards (2014)

[CC.2.4.8.B.1 \(Advanced\)](#) Analyze and/or interpret bivariate data displayed in multiple representations.

[CC.2.4.8.B.2 \(Advanced\)](#) Understand that patterns of association can be seen in bivariate data utilizing frequencies.

STATE: PA Core Anchors and Eligible Content (2014)

[M08.D-S.1.1.1 \(Advanced\)](#) Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative correlation, linear association, and nonlinear association.

[M08.D-S.1.1.2 \(Advanced\)](#) For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.

Alternate Eligible Content Code M08DS1.1.2a: Identify a statement that describes the relationship between variables displayed in a scatterplot

[M08.D-S.1.1.3 \(Advanced\)](#) Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. Example: In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

[M08.D-S.1.2.1 \(Advanced\)](#) Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible associations between the two variables. Example: Given data on whether students have a curfew on school nights and whether they have assigned chores at home, is there evidence that those who have a curfew also tend to have chores?

Alternate Eligible Content Code M08DS1.2.1a: Answer a question using data from a two-way table

Topic: Lessons 99-100-Analyzing Scatter Plots (E)

Minutes for Topic: 84

Core Lesson Description: Analyzing scatter plots

Core Lesson Student Learning Objectives: SWBAT describe patterns in scatter plots, such as clustering, outliers, positive or negative association, linear association or nonlinear association.

Core Lesson Essential Questions: What are the key characteristics of scatterplots? (E)

Topic: Lesson 103-Review and Assessment (I)

Minutes for Topic: 42

Core Lesson Description: Review and assessment

Core Lesson Essential Questions: What are scatter plots and how are they use to represent bi-variate data? (I)

Topic: Lesson 101-102-Trend Lines (E)

Minutes for Topic: 84

Core Lesson Description: Trend lines

Core Lesson Student Learning Objectives: SWBAT assess the fit of a trend line on a scatter plot and to make predictions and estimates using trend lines. (E)

**Core Lesson
Essential
Questions:** What are trend lines and how are they used to make predictions? (E)

Topic: Lesson 104-107-Two-Way Tables (E)

Minutes for Topic: 168

**Core Lesson
Description:** Two way frequency tables

**Core Lesson
Student Learning
Objectives:** SWBAT construct and interpret two-way frequency tables and two-way relative frequency tables.

**Core Lesson
Essential
Questions:** What are two-way frequency tables and two way relative frequency tables? (E)

Topic: Lessons 108-109-Review and Assessment (I)

Minutes for Topic: 84

**Core Lesson
Description:** Review and Assessment

**Core Lesson
Essential
Questions:** What are scatter plots and two frequency tables and how are they used to organize data? (I)

Topic: Lesson 110-120-PSSA REVIEW-Standardized Test Taking Skills and Open Ended Practice (E)

Minutes for Topic: 420

**Core Lesson
Description:** PSSA Review of all topics

**Core Lesson
Student Learning
Objectives:** SWBAT review test taking strategies using practice tests and released items. SWBAT improve their Open Ended responses using peer reviews, released items and practice tests.

**Core Lesson
Essential
Questions:** What have we studied all year and how can we be prepared for the PSSA? (E)

Unit:

This Curriculum Map Unit has no Topics to display