Curriculum Map: Math 8

Course: MATH 8 Sub-topic: General

Grade(s): None specified

Course Description:

Students in math 8 will focus on three critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

Unit: Unit 1 - Real Numbers and the Coordinate Plane

STANDARDS:

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.1 - Rational Numbers - Writing Repeating and Terminating Decimals

Minutes for Topic: 41

STANDARDS

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

Topic: Lesson 1.2 - Classifying Rational and Irrational Numbers

Minutes for Topic: 41

STANDARDS

STATE: PA Core Standards (2014)

CC.2.1.8.E.1 (Advanced)	Distinguish between rational and irrational numbers using their properties.
CC.2.1.8.E.4 (Advanced)	Estimate irrational numbers by comparing them to rational numbers.

Topic: Lesson 1.3 - Estimating Irrational Numbers

Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

CC.2.1.8.E.4 (Advanced)	Estimate irrational numbers by comparing them to rational numbers.

Topic: Lesson 1.4 - Classifying Real and Imaginary Numbers

Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.5 - Estimating, Comparing, and Ordering Rational and Irrational Numbers

Minutes for Topic: 41

STANDARDS

CC.2.1.8.E.4 (Advanced)   Estimate irrational numbers by comparing them to rational numbers.

Topic: Lesson 1.6 - Converting Repeating Decimals
        Minutes for Topic: 41
    STANDARDS
STATE: PA Core Standards (2014)
CC.2.1.8.E.1 (Advanced)   Distinguish between rational and irrational numbers using their properties.

Topic: Lesson 1.7 - Cube Roots
        Minutes for Topic: 123
    STANDARDS
STATE: PA Core Standards (2014)
CC.2.1.8.E.4 (Advanced)   Estimate irrational numbers by comparing them to rational numbers.

Topic: Lesson 1.8 - Pythagorean Theorem
        Minutes for Topic: 164
    STANDARDS
STATE: PA Core Standards (2014)
CC.2.3.8.A.3 (Advanced)   Understand and apply the Pythagorean Theorem to solve problems.

Topic: Lesson 1.9 - Review for Unit 1 Test
        Minutes for Topic: 41
    STANDARDS
STATE: PA Core Standards (2014)
CC.2.1.8.E.1 (Advanced)   Distinguish between rational and irrational numbers using their properties.
CC.2.1.8.E.4 (Advanced)   Estimate irrational numbers by comparing them to rational numbers.
CC.2.3.8.A.3 (Advanced)   Understand and apply the Pythagorean Theorem to solve problems.

Topic: Lesson 1.10 - Unit 1 Test
        Minutes for Topic: 41

Unit: Unit 2 - Solving Equations
 STANDARDS: **STANDARDS**
                STATE: Pennsylvania SAS Academic Standards (2009-2013)
                2.8.8.B (Advanced)   Evaluate and simplify algebraic expressions and solve and
                                     graph linear equations and inequalities.
                STATE: PA Core Standards (2014)
                CC.2.2.8.B.3   Analyze and solve linear equations and pairs of simultaneous
                (Advanced)   linear equations.

                 (* standards consolidated from Topic level)

Topic: Lesson 2.1 - Evaluating Numerical and Algebraic Expressions
        Minutes for Topic: 82
    STANDARDS
STATE: Pennsylvania SAS Academic Standards (2009-2013)
2.8.8.B (Advanced)   Evaluate and simplify algebraic expressions and solve and graph linear equations
                            and inequalities.

Topic: Lesson 2.2 - Writing Algebraic Expressions
        Minutes for Topic: 82
    STANDARDS
STATE: Pennsylvania SAS Academic Standards (2009-2013)
2.8.8.B (Advanced)   Evaluate and simplify algebraic expressions and solve and graph linear equations
                            and inequalities.

Topic: Lesson 2.3 - Solving One-Step Equations
    Minutes for Topic: 164
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.4 - Applications of One-Step Equations
    Minutes for Topic: 82
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.5 - Solving Two Step Equations
    Minutes for Topic: 82
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.6 - Solving Multi-Step Equations
    Minutes for Topic: 82
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.7 - Solving Equations with Variables on Both Sides
    Minutes for Topic: 123
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.8 - Solving Equations with One Solution, Infinite Solutions, or No Solution
    Minutes for Topic: 123
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.9 - Solving Word Problems by Writing and Solving Equations
    Minutes for Topic: 123
  STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 2.10 - Review for Unit Test on Solving Equations
    Minutes for Topic: 41

Topic: Lesson 2.11 - Unit Test on Solving Equations
    Minutes for Topic: 82

Unit: Unit 3 - Introductions to Functions and Graphing Functions
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.	
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.	

Topic: Lesson 1.1 - Thinking About Graphs - Reading Graphs, Comparing Graphs, and Creating Graphs
Minutes for Topic: 164

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.2 - Evaluating Functions and Completing Input-Output Tables
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.3 - Functions
Minutes for Topic: 82

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.

Topic: Lesson 1.4 - Proportional Relationships
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.5 - Slope
Minutes for Topic: 164

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.6 - Graphing Linear Equations by Making Tables
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.7 - Graphing Linear Equations by Using Slope-Intercept Form
Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.8 - Writing Linear Equations from Given Graphs
Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.9 - Graphing Linear Equations that are not in Slope-Intercept Form
> Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.10 - Solving Word Problems by Writing and Graphing Linear Equations
> Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.11 - Writing Linear Functions
> Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

CC.2.2.8.C.1 (Advanced)   Define, evaluate, and compare functions.

Topic: Lesson 1.12 - Comparing Linear Functions
> Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

CC.2.2.8.C.1 (Advanced)   Define, evaluate, and compare functions.

Topic: Lesson 1.13 - Graphing Linear Equations in Standard Form
> Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

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

Topic: Lesson 1.14 - Review for Unit Test on Graphing Linear Equations
> Minutes for Topic: 82

Topic: Lesson 1.15 - Unit Test on Graphing Linear Equations
> Minutes for Topic: 82

Unit: Unit 4 - Systems of Equations

STANDARDS: **STANDARDS**

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.1 - Solving Linear Systems by Graphing
> Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.2 - Solving Word Problems by Writing and Graphing Linear Systems
> Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.3 - Solving Special Systems of Linear Equations by Graphing
Minutes for Topic: 41
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 1.4 - Solving Linear Systems by Using Substitution
Minutes for Topic: 82
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 1.5 - Solving Linear Systems by Using Elimination
Minutes for Topic: 82
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 1.6 - Solving Special Linear Systems Algebraically
Minutes for Topic: 82
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 1.7 - Solving Word Problems by Writing and Solving Linear Systems Algebraically
Minutes for Topic: 82
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 1.8 - Review for Unit Test on Solving Linear Systems
Minutes for Topic: 82
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Topic: Lesson 1.9 - Unit Test on Solving Linear Systems
Minutes for Topic: 82
STANDARDS
STATE: PA Core Standards (2014)
CC.2.2.8.B.3 (Advanced)   Analyze and solve linear equations and pairs of simultaneous linear equations.

Unit: Unit 5 - Properties of Exponents
STANDARDS: **STANDARDS**
STATE: PA Core Standards (2014)
CC.2.2.8.B.1   Apply concepts of radicals and integer exponents to generate
(Advanced)   equivalent expressions.

Topic: Lesson 1.1 - Exponent Properties Involving Products
Minutes for Topic: 82
STANDARDS

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

Topic: Lesson 1.2 - Exponent Properties Involving Quotients
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.3 - Simplifying Expressions with Zero and Negative Exponents
Minutes for Topic: 123

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.4 - Simplifying Expressions with Exponents
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.5 - Writing Numbers in Scientific Notation
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.6 - Performing Operations with Numbers in Scientific Notation - Multiplying and Dividing
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic:

Topic: Lesson 1.7 - Performing Operations with Numbers in Scientific Notation - Addition and Subtraction
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.8 - Solving Word Problems by Performing Operations with Numbers in Scientific Notation
Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.9 - Review for Unit Test on Exponents
Minutes for Topic: 82

STANDARDS

Topic: Lesson 1.10 - Unit Test on Properties of Exponents
    Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Unit: Unit 6 - Geometry
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.
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.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 1.1 - Transformations and Translations
    Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.2 - Reflections
    Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.3 - Rotations
    Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.4 - Sequence of Transformations and Dilations
    Minutes for Topic: 82

STANDARDS

STATE: PA Core Standards (2014)

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

Topic: Lesson 1.5 - Volume of Cylinders
    Minutes for Topic: 82

STANDARDS

<u>STATE: PA Core Standards (2014)</u>

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

<u>STATE: PA Core Anchors and Eligible Content (2014)</u>

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 1.6 - Volume of Cones
Minutes for Topic: 41

STANDARDS

<u>STATE: PA Core Standards (2014)</u>

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

Topic: Lesson 1.7 - Volume of Spheres
Minutes for Topic: 41

STANDARDS

<u>STATE: PA Core Standards (2014)</u>

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

Topic: Lesson 1.8 - Review for Unit Test on Geometry
Minutes for Topic: 82

STANDARDS

<u>STATE: PA Core Standards (2014)</u>

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

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

Topic: Lesson 1.9 - Unit Test on Geometry
Minutes for Topic: 82

Unit: Unit 7 - Scatter Plots and Two Way Tables

STANDARDS: **STANDARDS**

<u>STATE: PA Core Anchors and Eligible Content (2014)</u>

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

Topic: Lesson 1.1 - Reading and Interpreting Scatter Plots
Minutes for Topic: 41

STANDARDS

<u>STATE: PA Core Standards (2014)</u>

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.

Topic: Lesson 1.2 - Creating and Analyzing Scatter Plots
     Minutes for Topic: 41

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.

Topic: Lesson 1.3 - Drawing and Finding a Line of Best Fit
     Minutes for Topic: 123

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.

Topic: Lesson 1.4 - Solving Problems with Scatter Plots
     Minutes for Topic: 82

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.

Topic: Lesson 1.5 - Two Way Tables
     Minutes for Topic: 123

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.

Topic: Lesson 1.6 - Review for Unit Test on Scatter Plots and Two Way Tables
     Minutes for Topic: 82

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.

Topic: Lesson 1.7 - Unit Test on Scatter Plots and Two Way Tables
     Minutes for Topic: 82

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.