

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Foundations of Algebra

Time Allotment: 13 days

Unit Sequence: 1

Major Concepts to be learned:

- Add, Subtract, Multiply and Divide Real Numbers
- Powers and Exponents
- Square Roots and Real Numbers
- Order of Operation
- Simplifying Expressions and Introduction to functions

Expected Skills to be demonstrated:

- The student will be able to use the 4 basic operations with real numbers.
- The student will be able to use powers and exponents with real numbers.
- The students will be able to find the square root of a real number.
- The student will be able to use the order of operations to simplify expressions.
- The students will be able to identify a relation and a function.

PA Standards:

Anchors/Eligible Content:

CC.2.1.HS
CC.2.1.HS.F.1
CC.2.1.HS.F.2

A1.1.1
A1.1.1.3
A1.1.1.1
A1.1.1.2

Instructional Strategies:

- Problem solving activities
- Lecture
- Hands-on activity
- Note Taking
- Math Binders

Assessments:

- Warm up problems
- One or two quizzes, End of Chapter Exam
- Open ended questions

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Equations

Time Allotment: 17 Days

Unit Sequence: 2

Major Concepts to be learned:

- Solving equations with the four basic operations.
- Solving multiple step equations.
- Solving Equations with variables on both sides of the equal sign.
- Solving equations for a given variable. Ratios, rates and proportions.
- Applications of proportions.
- Percent of increase/decrease, applications of percents.

Expected Skills to be demonstrated:

- The student will be able to solve equations using any of the 4 basic operations.
- The student will be able to solve multiple step equations and equations with variables on both sides.
- The students will understand rates, ratios and proportions and how to use them.
- The students will understand how to use percents and how to apply them to the real world.

PA Standards:

Anchors/Eligible Content:

CC.2.2.HS
CC.2.2.HS.D.7, 8, 9, 10

A1.1.2
A1.1.2.1.1
A1.1.2.1.2
A1.1.2.1.3

Instructional Strategies:

Assessments:

- Problem solving activities
- Lecture
- Note Taking
- Math Binders

- Warm up problems
- One or Two quizzes
- End of Chapter exam

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Inequalities

Time Allotment: 18 Days

Unit Sequence: 3

Major Concepts to be learned:

- Writing and graphing inequalities.
- Solving inequalities using the four basic operations.
- Solving multiple step inequalities as well as inequalities with variables on both sides
- Solving compound inequalities.Solving absolute value inequalities.

Expected Skills to be demonstrated

- The student will be able to write and graph an inequality on a number line.
- The student will be able to solve an inequality using the four basic operations.
- The student will be able to solve multiple step inequalities and inequalities that contain variables on both sides of the equal sign
- The student will be able to solve compound inequalities.
- The student will be able to solve absolute value inequalities.

PA Standards:

Anchors /Eligible Content:

CC.2.2.HS
CC.2.2.HS.D.7, 10

A.1.1.2, A1.1.2.1.1, A1.1.2.1.2, A1.1.2.1.3
A.1.1.3, A1.1.3.1.1, A1.1.3.1.2, A1.1.3.1.3

Instructional Strategies:

Assessments:

- Problem solving activities
- Hands-on activity
- Note Taking
- Math Binders

- Warm up questions
- One or Two quizzes per chapter
- End of Chapter exam.

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Functions

Time Allotment: 20 Days

Unit Sequence: 4

Major Concepts to be learned:

- Relations and Functions.
- Writing and graphing functions.
- Scatter plots and trend lines.
- Arithmetic Sequences.
- Graphing Relationships.

Expected Skills to be demonstrated:

- The student will be able to graph relations and functions.
- The student will be able to write relations and functions.
- The student will be able to construct scatter plots and determine the trend line.
- The student will be able to identify and extend an arithmetic sequence.

PA Standards:

Anchors/Eligible Content:

CC.2.2.HS
CC.2.2.HS.C.1

A1.1.2
A1.2.1.1.1
A1.2.1.1.2
A1.2.1.1.3

Instructional Strategies:

Assessments:

- Problem solving activities
- Hands-on activity
- Note Taking
- Math Binders

- Warm up exercises.
- 2-3 quizzes throughout the unit.
- End of the chapter exam.

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Linear Functions/Slope

Time Allotment: 14 Days

Unit Sequence: 5

Major Concepts to be learned:

- Identifying Linear functions
- Rate of change and slope.
- Direct Variation.
- Slope-intercept and Point-slope form of a linear equation.
- Slopes of parallel and perpendicular lines and transforming functions.

Expected Skills to be demonstrated:

- The student will be able to identify a linear function and graph it using intercepts and slope.
- The students will be able to use the slope formula to find the slope given two points.
- The student will be able to identify and construct a linear equation in slope-intercept or point-slope form.
- The student will be able to identify the slope of parallel and perpendicular lines and use it to form a linear equation.
- The student will be able to transform linear equations.

PA Standards:

Anchors /Eligible Content:

CC.2.2.HS
CC.2.2.HS.D.7, 10
CC.2.2.HS.C.1, 2, 3

A.1.2.1, A1.2.1.1.1, A1.2.1.1.2, A1.2.1.1.3
A1.2.1.2, A1.2.1.2.1, A1.2.1.2.2
A1.2.2.1, A1.2.2.1.3, A1.2.2.1.4

Instructional Strategies:

Assessments:

- Problem solving activities
- Hands-on activity
- Note Taking
- Math Binders

- Warm up exercises.
- 2-3 quizzes throughout the unit.
- End of Chapter test.

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Systems of Equations & Inequalities

Time Allotment: 16 Days

Unit Sequence: 6

Major Concepts to be learned:

- Solving systems of linear equations by graphing.
- Solving systems of linear equations by substitution.
- Solving systems of linear equations by elimination.
- Solving special systems of linear equations.
- Solving and graphing systems of linear inequalities.

Expected Skills to be demonstrated:

- The student will be able to solve a system of equations by graphing.
- The student will be able to solve a system of equations by substitution.
- The student will be able to solve a system of equations by elimination.
- The student will be able to solve special systems of equations.
- The student will be able to graph and solve a system of linear inequalities.

PA Standards:

Anchors /Eligible Content:

CC.2.2.HS
CC.2.2.HS.D.10

A1.1.2.2, A1.1.2.2.1, A1.1.2.2.2
A1.1.3.1, A1.1.3.1.1, A1.1.3.1.2, A1.1.3.1.3
A1.1.3.2, A1.1.3.2.1, A1.1.3.2.2

Instructional Strategies:

Assessments:

- Problem solving activities
- Lecture
- Hands-on activity
- Note Taking
- Math Binders

- Warm up exercises
- 2 or 3 quizzes throughout the chapter.
- End of the chapter exam

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Exponents and Polynomials

Time Allotment: 18 Days

Unit Sequence: 7

Major Concepts to be learned:

- Integer exponents, powers of ten and scientific notation.
- Multiplying and Dividing with Exponents.
- Adding, subtracting and multiplying polynomials.
- Special product of binomials.

Expected Skills to be demonstrated:

- The student will be able to simplify integer exponents.
- The student will be able to write and use powers of ten and convert numbers into scientific notation.
- The student will be able to multiply and divide numbers in scientific notation.
- The student will be able to multiply and divide expressions with exponents.
- The student will be able to identify a polynomial.
- The student will be able to add, subtract and multiply polynomials.
- The student will be able to find special products of binomials-perfect square trinomials and a difference of two squares.

PA Standards/Anchors:

Eligible Content:

2.1.8.A, B
2.1.11.A
2.8.11.S

M11.A.1.1.2
M11.A.2.2.1, 2
M11.D.2.2.1

Instructional Strategies:

Assessments:

- Problem solving activities
- Lecture
- Hands-on activity
- Note Taking
- Math Binders

- Warm up exercises
- 2 or 3 quizzes throughout the chapter.
- End of the chapter exam

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Factoring Polynomials

Time Allotment: 15 Days

Unit Sequence: 8

Major Concepts to be learned:

- Factors and Greatest Common Factors
- Factoring using the GCF
- Factoring Quadratic Trinomials
- Factoring special Products
- Learning to choose a Factoring Method

Expected Skills to be demonstrated:

- The students will be able to find a greatest common factor and use it to factor a polynomial.
- The students will be able to factor a quadratic trinomial with a lead coefficient of 1 and with a lead coefficient other than 1.
- The students will be able to factor perfect square trinomials and a difference of two squares using short cut methods of factoring.
- The students will be able to determine what factoring method is appropriate for each given polynomial.

PA Standards/Anchors:

Eligible Content:

2.1.8.E
2.8.11.S

M11.A.1.2.1
M11.D.2.2.2

Instructional Strategies:

Assessments:

- Problem solving activities
- Lecture
- Hands-on activity
- Note Taking
- Math Binders

- Warm up exercises
- 2 or 3 quizzes throughout the chapter.
- End of the chapter exam

Grade: 7th – 10th

Course Title: Algebra I

Topic/Concept: Data Analysis & Probability

Time Allotment: 10 Days

Unit Sequence: 9

Major Concepts to be learned:

- Organizing and displaying data on different types of graphs.
- Data distribution.
- Misleading graphs and statistics
- Experimental and theoretical probability.
- Independent and dependent events.
- Combinations and Permutations.

Expected Skills to be demonstrated:

- The student will be able to organize and display data on different types of graphs.
- The student will be able to describe the central tendency of a data group and use a box and whisker plot to represent it.
- The student will be able to find experimental and theoretical probability.
- The student will be able to find the probability of independent and dependent events.
- The student will be able to solve problems involving combinations and permutations.

PA Standards/Anchors:

Eligible Content:

2.6.11.A, C, D
2.6.8.A, E
2.7.11.A, E
2.7.8.A

M11.E.1.1.1, 2
M11.E.2.1.1-3
M11.E.3.1.1
M11.E.3.2.1
M11.E.4.2.1

Instructional Strategies:

Assessments:

- Problem solving activities
- Lecture
- Hands-on activity
- Note Taking
- Math Binders

- Warm up exercises
- 2 or 3 quizzes throughout the chapter.
- End of the chapter exam