Algebra I Curriculum

Based on Indiana Department of Education Academic Standards

Week 1

Real Numbers and Expressions

- Classification of numbers within the real number system
- Rational and irrational numbers
- Whole numbers
- Integers
- Properties of exponents
- Numeric expression
  - Rewriting numeric expressions with positive rational exponents
- Monomials
- Simplification of Square Roots
  - Non-perfect square integers
  - Algebraic monomials

Week 2

Real Numbers and Expressions (continued)

- Greatest Common Factors
  - Factor:
    - The difference of two squares
    - Perfect square trinomials
    - Polynomials
    - Quadratic expressions
- Polynomials
  - Adding, subtracting, multiplying polynomials, and dividing polynomials by monomials

Week 3

Functions

- Relations and functions
- Domain
  - Find $f(x)$ for each x in the domain of f
  - Relate (x, y) to $(x, f(x))$
- Range
- Output
- Input
- Function notation

<u>Week 4</u>

+ Functions (continued)
- Mapping diagram
- Determining whether a relation is a function given a set of ordered pairs, a table, mapping diagram, or graph
- Linear/Non-linear functions
- Maximum and minimum values
- Independent and dependent variables

<u>Week 5</u>

+ Linear Equations, Inequalities, and Functions
- Manipulating linear equations to create equivalent equations
- Solving a variety of linear equations and linear inequalities in one variable
- Linear equation given a table of values
- Algebraic proportions
- Linear Functions
  - Slope
  - X and Y –intercepts
  - Standard form
  - Point-slope form
  - Slope-intercept form
  - Solution set and identifying it
  - Compound linear equalities
- Absolute value linear equations
- Literal equations

<u>Week 6</u>

+ Systems of Equations and Inequalities
- System of linear equations
- Elimination method
- Substitution method
- Understanding the relationship between a solution of a pair of linear equations in two variables and the graphs of the corresponding lines
- Solving pairs of linear equations in two variables by graphing \

<u>Week 7</u>

+ Quadratic and Exponential Equations and Functions
- Exponential functions
- Intervals
- $y = ab^x$ (for integer values of x > 1, rational values of b > 0 and b $\neq$ 1)
- Zero product property

- Solving quadratic equations using square roots
- Quadratic formula – solving equations
- Graphing Quadratic Functions and Equations
  - Line of symmetry
  - Extreme value
  - Zeros of a function
  - Parabolas

Week 8

Data Analysis, Statistics, and Probability
- Random and nonrandom sampling
- Bias (and how it can be controlled)
- Survey
- Experiment
- Inference
- Bivariate data
- Scatter plot
- Positive and negative associations
- Nonlinear associations
- Using technology to find a linear function that models a relationship for bivariate data set to make predictions
- Interpreting the slop and y-intercept, computing, and interpreting the correlation coefficient
- Correlation and causation
- Frequency and relative frequency
- Two-way table
- Joint relative frequency
- Marginal relative frequency
- Conditional relative frequency