ALGEBRA I SCOPE & SEQUENCE

UNIT 1: FUNCTIONS
6 Weeks

ESSENTIAL STANDARDS:

HSA.REI.B.3

Solve linear equations, ~~inequalities and absolute value equations in one variable, including equations with coefficients represented by letters~~

HSF.IF.A.1

- Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range
- Understand that if f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x
- Understand that the graph of f is the graph of the equation y = f(x)

HSF.IF.A.2

In terms of a real-world context:

- Use function notation
- Evaluate functions for inputs in their domains
- Interpret statements that use function notation

HSF.IF.B.4

For a function that models a relationship between two quantities:

- Interpret key features of graphs and tables in terms of the quantities, and
- Sketch graphs showing key features given a verbal description of the relationship

HSF.IF.C.9

- Compare properties of two functions each represented in a different way

SUPPORTING STANDARDS: HSF.IF.A.3   HSF.IF.B.5

UNIT 2: LINEAR EQUATIONS
3 Weeks

ESSENTIAL STANDARDS:

HSA.CED.A.1

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

HSA.CED.A.2

- Create equations in two or more variables to represent relationships between quantities
- Graph equations in two variables on the coordinate plane

HSA.REI.B.3

- Solve linear equations, inequalities ~~and absolute value equations in one variable, including equations with coefficients represented by letters~~

HSF.IF.C.7

Graph functions expressed algebraically and show key features of the graph, with and without technology

SUPPORTING STANDARDS:

HSN.Q.A.1	HSA.CED.A.4	HSF.IF.A.2
HSN.Q.A.2	HSA.REI.D.10	HSF.IF.B.6
HSN.Q.A.3	HSF.IF.A.1	HSF.BF.A.1
HSA.CED.A.3		

UNIT 3: SYSTEMS OF LINEAR FUNCTIONS
3-4 Weeks

ESSENTIAL STANDARDS:

HSA.REI.C.5
- Solve systems of equations in two variables using substitution and elimination
- Understand that the solution to a system of equations will be the same when using substitution and elimination

HSA.REI.C.6
Solve systems of equations algebraically and graphically

HSF.IF.C.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)

SUPPORTING STANDARDS:

HSA.CED.A.2	HSF.IF.A.1
HSA.REI.D.11	HSF.IF.A.2
HSA.REI.D.12	HSF.BF.A.1

UNIT 4: QUADRATIC FUNCTIONS
5-6 Weeks

ESSENTIAL STANDARDS:

HSA.CED.A.2
- Create equations in two or more variables to represent relationships between quantities
- Graph equations, in two variables, on a coordinate plane

HSF.IF.B.4
For a function that models a relationship between two quantities:
- Interpret key features of graphs and tables in terms of the quantities, and
- Sketch graphs showing key features given a verbal description of the relationship

HSF.IF.C.7
Graph functions expressed algebraically and show key features of the graph, with and without technology
- Graph linear and quadratic functions and, when applicable, show intercepts, maxima, and minima

SUPPORTING STANDARDS:

HSN.RN.B.3	HSA.REI.D.10	HSF.BF.A.1
HSN.Q.A.2	HSF.IF.B.6	HSF.BF.B.3
HSA.REI.C.7	HSF.IF.C.9	

UNIT 5: QUADRATIC EQUATIONS
5 Weeks

ESSENTIAL STANDARDS:

HSA.SSE.B.3

Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression*
- Factor a quadratic expression to reveal the zeros of the function it defines

HSF.IF.C.8
- Write expressions for functions in different but equivalent forms to reveal key features of the function
- Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values (vertex), and symmetry of the graph, and interpret these in terms of a context.

HSA.REI.B.4

Solve quadratic equations (as appropriate to the initial form of the equation) by:
- Inspection of a graph
- Taking square roots
- ~~Completing the square~~
- Using the quadratic formula
- Factoring

SUPPORTING STANDARDS:

HSN.RN.B.3	HSN.Q.A.3	HSA.REI.A.1
HSN.RN.B.4	HSA.SSE.A.1	HSA.REI.C.7
HSN.Q.A.1	HSA.SSE.A.2	HSF.IF.C.9

UNIT 6: EXPONENTIAL FUNCTIONS
4 Weeks

ESSENTIAL STANDARDS:

HSA.CED.A.2
- Create *[exponential]* equations in two or more variables to represent relationships between quantities
- Graph *[exponential]* equations, in two variables, on a coordinate plane

HSF.IF.C.7
- Graph exponential functions, showing intercepts and end behavior

HSF.LE.A.1
- Distinguish between situations that can be modeled with linear functions and with exponential functions
- Show that linear functions grow by equal differences over equal intervals, and that exponential functions grow by
- equal factors over equal intervals
- Recognize situations in which one quantity changes at a constant rate per unit interval relative to another
- Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another

HSF.LE.A.2
Construct linear and exponential equations, ~~including arithmetic and geometric sequences~~:
- given a graph
- a description of a relationship
- two input-output pairs (include reading these from a table)

SUPPORTING STANDARDS:

HSN.Q.A.1	HSA.CED.A.1	HSF.IF.B.6	HSF.LE.A.3
HSN.Q.A.2	HSA.CED.A.2	HSF.IF.C.9	HSF.LE.B.5
HSN.Q.A.3	HSF.IF.B.4	HSF.BF.A.1	

UNIT 7: NON-LINEAR FUNCTIONS
5 Weeks

ESSENTIAL STANDARDS:
HSA.APR.A.1
- Add, subtract, and multiply polynomials
- ~~Understand that polynomials, like the integers, are closed under addition, subtraction, and multiplication~~

HSA.SSE.A.2
Use the structure of an expression to identify ways to rewrite it

SUPPORTING STANDARDS:

HSA.APR.B.3   HSA.APR.C.4   HSA.APR.D.7   HSA.REI.B.3

UNIT 8: DATA ANALYTICS
4 Weeks

ESSENTIAL STANDARDS:

HSS.ID.A.1

Represent data with plots on the real number line (dot plots, histograms, and box plots)

HSS.ID.A.2

Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets

HSS.ID.B.6

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related
- Fit a function to the data; use functions fitted to data to solve problems in the context of the data

SUPPORTING STANDARDS:

HSN.Q.A.1	HSS.ID.A.3	HSS.ID.C.8
HSN.Q.A.2	HSS.ID.B.5	HSS.ID.C.9
HSN.Q.A.3	HSS.ID.C.7	