Algebra II: Linear Functions and Systems

Students will identify the key features of functions and understand how to interpret graphs of functions. Students will learn methods for solving equations and inequalities and systems of linear equations and inequalities by using graphing, tables, and matrices.

Essential Question: What are the ways in which functions can be used to represent and solve problems involving quantities?

Essential Understanding Per Lesson:

1.1- The key features of a graph-including the domain, range, and intercepts-reveal the relationship between two quantities.

1.2- A function of the form $f(x)=a \times f[b(x-h)]+k$ is transformed by changing the values of a, b, h, or k.

1.3- A piecewise-defined function is used to model situations in which there are different rules for different parts of the domain of the function.

1.4- An arithmetic sequence is a sequence of numbers in which the terms have a common difference. An arithmetic series is the sum of the terms in a finite arithmetic sequence and can be found using an explicit definition for the sum.

1.5- To solve an equation or inequality by graphic, set each expression equal to y and graph the two equations on the same grid. Their intersection represents the solution.

1.6- The solution of a system of linear equations or inequalities is the set of ordered pairs that satisfy all the equations or inequalities in the system. Systems of equations or inequalities can also be represented by a matrix.

1.7- A matrix can be used to represent a system of linear equations. Row operations can be applied to the matrix to convert it to the identity matrix with an additional column that indicates the solution of the original system of equations.

STEM Project: Students will analyze historical data on fuel efficiency for cars. Students will research fuel efficiency on other types of vehicles, such as minivans, or trucks.

Mathematical Modeling: Students will analyze the current used by pairs of power tools. They will use the concepts learned in this unit to determine whether the circuit can handle all three power tools.

Content Standards:
HSF.IF.B.4, HSF.IF.C.7, HSF.IF.B.6, HSF.BF.B.3, HSF.IF.B.5, HSS.ID.B.6.A, HSF.LE.A.2, HSF.BF.A.2, HSF.IF.A.3, HSA.REI.D.11, HSA.CED.A.1, HSA.REI.C.6, HSA.CED.A.1, HSA.CED.A.3

Mathematical Practices: MP. 1-8