Intermediate Algebra

Course Description

Algebra is the study of mathematics using variables (letters) to represent unknown quantities. This course has two major parts, the structure and the method. The structure part of the course deals with the intermediate rules and properties to be used in algebra. The method part of the course consists of working with the solving of linear and non-linear equations and inequalities. Throughout the year the applications of algebra in related fields are introduced to correspond to the present level of development.

Please see below for our proficiency learning targets for example grade level:

Unit 1: Rational Numbers, Expressions and Equations

As evidence based on classroom assessment and learning, the student is able to:

1.1 Evaluate Rational Number Operations

I. **Addition and Subtraction (Integers, Fractions, Mixed Numbers, Decimals)**
II. **Multiplication and Division (Integers, Fractions, Mixed Numbers, Decimals)**
III. **Order of Operations (Integer Only)**

1.2 Writing and Simplifying Algebraic Expressions

I. **Write Algebraic Expressions into Verbal Expressions and Verbal into Algebraic**
II. **Simplify Expressions with Distributive Property and Like Terms**
III. **Identify Equivalent Expressions**
IV. **Rearrange multi variable equations**

1.3 Classify the subgroups of Real Numbers, Properties of Addition and Multiplication,

I. **Classify each value**
II. **Identify and Apply the properties from an equation**
III. **Identifying equivalent Equations**

Unit 2: Solving Linear Equations

As evidence based on classroom assessment and learning, the student is able to:

2.1 Solving Equations

I. **Solve One Step Equations**
II. **Solve Two Step Equations**

2.2 Solve Multi-Step Equations

I. **Solve Multi Step Equations- Variable on both sides**
II. **Know the difference between One Solution, No Solutions, or Infinite Solutions**

2.3 Solve Absolute Value Equations

I. **Solve Absolute Value Equations**
II. **Know the difference between One Solution, Two Solutions, No Solutions, or Infinite Solutions**

2.4 Rewriting Multivariable equations

I. **Rearrange equations to be solved for different variables**

Unit 3: Solving Single Variable Inequalities

As evidence based on classroom assessment and learning, the student is able to:

3.1 Graph Inequalities

I. **Write and Graph Inequalities**

3.2 Solve Inequalities

I. **Solve One Step Inequalities**
II. **Solve Two Step Inequalities**
III. **Solve Multi Step Inequalities**
IV. **Explain the Significance of flipping the sign**

3.3 Compound Inequalities

I. **Solve and graph compound inequalities**

Unit 4: Introduction to Trigonometry

As evidence based on classroom assessment and learning, the student is able to:

4.1 Find the value of a Trigonometric Ratio

I. **Define Trig Functions and Lengths of a Triangle**
II. **Find the value of a Trigonometric Ratio**
III. **Finding a Trigonometric Ratio while applying the Pythagorean Theorem**

4.2 Find the value of a missing angle using Trig

I. **Find the missing angle in function form**

II. **Find the missing angle given dimensions**
III. **Find missing angles(Elevation vs Depression) of a given word problem**

4.3 Find the missing length of a triangle using Trig

I. **Find a missing length given a side and an angle**
II. **Find missing lengths and angles of a given word problem**
III. **Application of Trig to find missing speed within a word problem**

4.4 Midpoints and Distance Formulas

I. **Find the midpoint given two endpoints**
II. **Find the endpoint given a midpoint and one endpoint**
III. **Find the distance between two points**

Unit 5: Functions

As evidence based on classroom assessment and learning, the student is able to:

5.1 Classifying Functions through Points, Mappings, Tables, and Graphs

I. **Difference between a relation and a function**
II. **Classify Functions Points, Mappings, Tables, Graphs**

5.2 Interpret Graphs and describe the scenarios

I. **Given a Graph scenario distance(y) over time(x), write a corresponding statement to match the graph**
II. **Given a Story, create a corresponding Graph**

5.3 Evaluate Functions and describe the Domain, Range

I. **Find input/output in f(x) = y form**
II. **Match Table to Graph to Equation to Story given limited information**
III. **Determine the Domain and Range of Graphed Functions**

5.4 Exponential Functions(growth/decay)

I. **Identify Linear or Exponential from a set of data values, statements, graphs**
II. **Find the Common Ratio, shown via graph and table**
III. **Determine Exponential Growth or Decay and express values over a time period**

Unit 6: Writing and Graphing Linear Equations

As evidence based on classroom assessment and learning, the student is able to:

6.1 Find Slope through Graphs, Points, Table and Equations

I. Graphs, Tables, Points

II. Equations(Slope Int, Standard, or Any Form)

III. Application of Slope to Find Missing Coordinate

6.2 Determine Slope Intercept Form(y=mx + b) form Graphs, Equations and Parallel Perpendicular Equations

I. Graph or Write equations of a pair of points into y=mx+b

II. Rearrange multi variations of equations to y=mx+b

III. Given points or a Parallel(Perpendicular) Equation find the equation of a line in y=mx+b

6.3 Graph/Write/Interpret equations in Standard Form (Ax + By = C)

I. Graph using Intercepts in ax + by = c Form

II. Given a Graph or set of points create a equation in ax + by = c

III. Rearrange multi variations of equations to ax + by = c Form

6.4 Write/Graph equations in Point Slope Form y - y1 = m(x - x1)

I. Graph equations given Point Slope Form

II. Given a point(s), slope, or graph, write an equation in Point Slope Form

Unit 7: Solving Two Variable Linear Inequalities

As evidence based on classroom assessment and learning, the student is able to:

7.1 Write and Graph Linear Inequalities in Slope Intercept Form

7.2 Write and Graph Linear Inequalities in Standard Form

Unit 8: Systems of Equations

As evidence based on classroom assessment and learning, the student is able to:

8.1 Graphing Systems of Equations in Slope Intercept and Standard Form

8.2 Solve Systems of Equations with Substitution

8.3 Solve Systems of Equations with Elimination

8.4 Write and Graph Systems of Linear Inequalities

Unit 9: Factoring Binomials

As evidence based on classroom assessment and learning, the student is able to:

9.1 Multiply, Name, Classify Polynomials

9.2 Factor Polynomials by GCF, Binomials, and by Grouping

Unit 10: Quadratic Functions

As evidence based on classroom assessment and learning, the student is able to:

10.1 Graph Quadratics in Standard and Vertex Form

10.2 Finding roots of a Quadratic by completing the square

10.3 Find roots of a Quadratic by using the quadratic formula