Grade 6 -8 Math

- **Integers and Absolute Values**
    - Graph a whole number and its opposite on a number line.
    - Discuss and identify the absolute value of an integer.
    - Define numbers that are zero pairs.
    - Explain how to compare integers on a number line by using < > symbols or words.
    - Write or say the order integers on a number line from least to greatest or greatest to least
    - Write or say the order of several integers that come from a real-world situation either greatest to least or least to greatest
    - **Add and Subtract Integers**
        - Use models to represent integer operations
        - Apply my understanding of a zero pair when adding and subtracting integers.
        - Connect models to algorithms for integer operations.
        - Write an expression to represent a situation involving integers.
        - Use properties of operations to solve problems involving addition and subtraction of integers
        - Solve problems with mathematical and real-world context involving addition and subtraction of integers
    - **All Operations of Integers**
        - Multiply and divide integers using a number line or concrete manipulative.
        - Discover a rule or pattern from the models and use that to create a rule for multiplying and dividing with integers.
        - Solve multiplication and division problems with integers.
        - Use models to represent integer operations
        - Connect models to the algorithms for integer operations.
        - Write an expression to represent a situation involving integers.
        - Use properties of operations to solve problems involving multiplication and division of integers
        - Solve problems with mathematical and real-world context involving multiplication and division of integers
        - Solve problems involving any operation for integers.
- **Rational Number Operations**
    - **Understanding Rational Numbers**
        - Locate and graph a fraction and decimal and its opposite on a number line.
        - Compare rational numbers on a number line by using inequality symbols or words.
        - Order a set of rational numbers on a number line from least to greatest or greatest to least verbally and in writing.
        - Order a set of rational numbers that come from a real-world situation either greatest to least or least to greatest verbally and in writing.
        - Define rational numbers
        - Use a Venn Diagram or other visual organizer to show the relationships between sets and subsets of rational number
    - **Multiplying Positive Rational Numbers**
        - Explain why a number increases or decreases in value when it is multiplied by a fraction.
        - Estimate fractions and mixed numbers to a whole number or halves to find a reasonable range of products.
        - Use a concrete models and pictorial models to solve problems involving multiplication of positive fractions and decimals

- Make connections between models and algorithms for multiplying rational numbers.
- Solve multiplication problems with positive fractions and/or decimals using the algorithms

- **Dividing Positive Rational Numbers**
  - Explain the connection between multiplying and dividing fractions.
  - Estimate quotients of fractions and mixed numbers to a whole number or halves to find a reasonable range of products.
  - Use models to solve problems involving division of positive fractions and decimals
  - Make connections to the using models and algorithms
  - Solve division problems with positive fraction and/or decimals using an algorithm

- **Ratios and Proportions**
  - **Representing Ratios**
    - Represent a ratio using models
    - Represent a ratio using a fraction or decimal
    - Write ratios in multiple ways including as a fraction, written with the word "to", and with a colon
    - Use objects to represent part to part and part to whole ratio comparisons
    - Use models to determine equivalent ratios
    - Use a ratio table to determine equivalent ratios
    - Scale up and scale down to determine equivalent ratios
    - Find a multiplicative scale factor to determine equivalent ratios
    - Use a ratio to solve a real-world problem.
  - **Rates**
    - Represent a rate as a quotient
    - Explain how a rate is a comparison of two quantities including providing examples of rates
    - Determine the rate in a given problem
    - Use a rate to convert within a measurement system including metric and customary
  - **Use Ratios and Rates too solve Problems**
    - Compare different ratios or rates to determine which ratio or rate is greater, less, or better in context of the situation.
    - Use proportions to make predictions and comparisons involving ratios, rates of an unknown value
    - Predict and compare for a given part or whole, given an equivalent ratio or rate using a real-world word problem

- **Percentages**
  - Use base 10 blocks to represent percents.
  - Use a 100s grid to represent percents and their equivalent fraction and decimal values.
  - Use strip diagrams to represent benchmark fractions and percents.
  - Represent percents on a number line.
  - Represent percents with strip diagrams that shows a part to whole relationship.
  - Represent equal parts of the same whole with a percent, fraction, and decimal.
  - Use concrete models to generate equivalent forms of fractions, decimals and percent.
  - Generate equivalent forms of fractions, decimals and percents using pictorial models.
  - Generate equivalent forms of fractions, decimals and percents using algebraic methods
  - Generate equivalent forms of fractions, decimals and percents in order to solve problems.

- **Percent applications**
    - Use concrete and pictorial models to find the unknown value when the part, percent or the whole is given
    - Use an equation to find the unknown value when the part, whole or percent is given
    - Find the whole given the part and percent.
    - Find the part given the whole and the percent.
    - Find the percent given the part and the whole.

- **Multiple Representations**
    - **Graphing on the coordinate plane**
        - Identify and label the four quadrants of the coordinate plane.
        - Locate and determine which quadrant or axis an ordered pair is located.
        - Graph ordered pairs of rational numbers.
        - Name the ordered pair that represents a graphed point on the coordinate plane.
        - Describe the relationship between points on a coordinate plane
        - Describe the independent and dependent variable for a graph in context of the situation
        - Explain the meaning of an ordered pair in real-world situations.
        - Graph a situation from a table or set of ordered pairs
    - **Additive vs Multiplicative Relationships**
        - Identify an additive relationship from a table, graph, verbal description, or equation.
        - Identify a multiplicative relationship from a table, graph, verbal description, or equation.
        - Identify similarities and differences between additive and multiplicative relationships given a graph, verbal descriptions, table and equation.
        - Use a graphic organizer, such as a Venn Diagram to compare the ways that additive and multiplicative relationships are alike and different.
    - **Writing Equations and Translating Between Views**
        - Define the independent and dependent variables in a problem.
        - Write an equation that represents the relationship between the independent and dependent variables.
        - Represent linear relationship with verbal descriptions, tables, graphs, and/or equations.
        - Identify representations that describe the same relationship.
        - Use one representation to generate the other representations.
        - Understand how the parts of the equation □□ = □□ + □□ or □□ = □□ + □□ are represented in each of the representations.
        - Solve problems that require representing a given situation using verbal descriptions, tables, graphs and/or equations.

- **Equations and Inequalities**
    - **Generating Equivalent Expressions**
        - Factor composite numbers and re-write in exponential form.
        - Expand exponent notation to generate and equivalent numeric value.
        - Identify when two numeric expressions are equivalent.
        - Find a single number solution for an expression with multiple steps using the order of operations.
        - Find equivalent expressions for multi-step problems.
        - Compare and contrast expressions and equations.
        - Write expressions from models.
        - Write expressions from verbal descriptions.

- Find the value of an algebraic expression when given the value of the variables.
- Generate equivalent numerical expressions using order of operations.
- Use properties of arithmetic to generate equivalent numerical expressions from mathematical situations and real-world scenarios.
    - Associative Property
    - Commutative Property
    - Distributive Property
    - Identity Property
    - Inverse Property
- Use properties of algebra and arithmetic to generate algebraic expressions from mathematical situations and real- world scenarios.
    - Associative Property
    - Commutative Property
    - Distributive Property
    - Identity Property
    - Inverse Property
- Use models, pictures, and algebraic representations to determine if two expressions are equivalent.

- **Representing equations and inequalities**
    - Identify situations as equations or inequalities
    - Write a one-variable one step equation that represents a situation
    - Write a one-variable, one-step inequality that represents a situation
    - Write an equation or inequality verbally (I.e. two times the value of x minus 5 is greater than 3)
    - Create a situation when given a one-variable, one-step equation.
    - Create a situation when given a one-variable, one-step inequality
- **Solving Equations and Inequalities**
    - Explain (written or verbally) what a solution to an equation represents
    - Explain what a solution of an inequality represents
    - Model and solve a one-variable, one-step equation using manipulatives and models
    - Make connections between using models and inverse operations
    - Solve one-variable, one-step equations using inverse operations
    - Solve equations from real-world situations.
    - Graph solutions for an inequality on a number line
    - Model and solve one-variable, one-step inequalities
    - Explain and justify when to reverse the inequality symbol while solving an inequality
    - Solve a one-variable, one-step inequality from a real-world situation
    - Solve equations that represent geometric concepts including perimeter, area, measure of angle, supplementary angles and complementary angles.

- **Geometric Applications of Equations**
    - **Properties of Triangles**
        - Understand that the sum of the angles in a triangle is 180°.
        - Understand the relationship between the side lengths and angles of a triangle.
        - Determine when 3 angles form a triangle.
        - Find the missing angle in a triangle.
        - Use the relationship between sides and angles of a triangle to identify/label sides and angles of a triangle
        - Determine if three lengths could be the sides of a triangle.

- **Measurements**
    - Decompose and rearrange parts of shapes to model area formulas of 2D shapes.
    - Relate the formulas for area of 2D shapes to the formulas for area of other 2D shapes.
    - Write an equation representing a problem situation involving area.
    - Use equations to find the area of a 2D shape.
    - Use equations to find a missing dimension of a 2D shape when given the area.
    - Interpret mathematical information related to area contained in a problem situation in order to write an equation representing the situation.
    - Write an equation to find missing dimension
    - Solve problems involving area.
    - Write an equation using information related to volume contained in a problem situation in order to write an equation representing the situation.
    - Understand that B in the volume formula is the area of the Base of the prism.
    - Write equations representing situations involving volume.
    - Use models to solve equations.
    - Create an equation that will solve for a missing dimension when given volume
    - Determine the volume of a rectangular prism.
    - Determine the missing dimension of a rectangular prism when given the volume.
    - Solve problems involving volume of right rectangular prisms.

- **Data and Statistics**
    - **Analyzing and Interpreting Categorical Data**
        - Create a frequency table to represent categorical data.
        - Create a relative frequency table to represent categorical data
        - Make connections between strip diagrams and percent bar graphs to create a stacked (or segmented) bar graph
        - Create a percent bar graph to represent categorical data where the bars are separate
        - Determine the mode of the data
        - Describe the variability, if any, in the data
    - **Representing, Analyzing and Interpreting Numerical Data**
        - Create a dot plot, from numeric data
        - Create a stem-and-leaf plot from numeric data
        - Create a histogram from numeric data
        - Create a box plot from numeric data
        - Solve problems from graphical representations
        - Determine numerical summaries of data by calculating the mean, median, range and interquartile range (IQR) of the numeric data.
        - Describe the shape of a data distribution using vocabulary such as skewed, left skewed, right skewed, symmetrical and uniform
        - Describe the center of the data using median and mean
        - Describe the spread of the data using the range and the IQR
        - Describe the variability of the data
        - Solve problems from graphical representation

- **Financial Literacy**
    - **Credit Cards vs Debit Cards and Checking Accounts**
        - List features of credit cards.
        - List features of debit cards.
        - Compare and contrast credit cards and debit cards.

- Understand checking account fees and features of a checking account.
- Understand debit card fees and the connection to the checking account.
- Identify withdrawals and deposits and record them on a check register
- Balance a check registe

- **Credit Reports**
  - Determine activities that lead to positive credit history and activities that lead to negative credit history.
  - Explain the length of time information is reported on a credit report
  - Explain how creditors use information on a credit report.
  - Explain how consumers use information on a credit report
- **Paying for College & Jobs and Income**
  - Explain how scholarships pay for college
  - Explain how grants pay for college
  - Explain how work study pays for college
  - Explain how student loans pay for college
  - Explain how savings pays for college
  - Research jobs and record their education required and annual salary
  - Recognize the effect of salaries on lifetime income
  - Create a spreadsheet to compare calculated different annual salaries and the effects this has on a lifetime income

Grade 7 Math

- **Rational Number Operations**
  - **Sets and Subsets and rational operations**
    - Classify rational numbers using visual representations
    - Describe the relationships between sets and subsets of rational numbers
    - Add, subtract, multiply and divide rational numbers.
    - Determine appropriate operations when given a context
- **Proportional Relationships**
  - **Application of Ratios, Rates, and Percents**
    - Use proportions to solve word problems, and make predictions and comparisons.
    - Calculate unit rates from mathematical and real-world application problems and use the unit rates to convert between measurement systems.
  - **Similarity**
    - Identify corresponding angles in two figures.
    - Identify corresponding sides in two figures.
    - Write proportions that describe the relationship of sides between similar shapes.
    - Write proportions that describe the relationship of sides within similar shapes
    - Simplify a ratio to determine if two figures are similar or not.
    - Use a scale on a map to solve problems.
    - Use a scale provided to solve real-world problems.
    - Solve problems involving similarity
  - **Linear Relationships**
    - **Constant rate of Change and Linear relatioships**
      - Represent constant rates of change in a table
      - Represent constant rates of change in a graph
      - Represent constant rates of change in a verbal situation
      - Represent constant rates of change in an equation in the form of y=kx
      - Make the connection between the unit rate and the constant of proportionality
      - Determine the constant of proportionality from a table
      - Determine the constant of proportionality from a graph
      - Determine the constant of proportionality from a verbal situation
      - Determine the constant of proportionality from an equation
      - Calculate the rate of change from a table, graph, verbal, or mathematical situations.
      - Make connections between the different representations for the rate of change.
      - Determine the initial value of a situation from a table, graph, verbal, or mathematical situation.
      - Predict future values in linear situations from all representations.
      - Describe in words the components of a linear equation and what they represent.
      - Fluently convert between all four representations of linear situations.
      - Compare and contrast different linear situations
      - Compare rates of change and initial value and their meaning in different linear situations.
- **Equations and Inequalities**
  - **Representing Equations and Inequalities**
    - Model equations that represent a verbal situation.
    - Write an expression to represent a verbal situation for an equation or inequality
    - Write a one-variable two step equation that represents a situation
    - Model inequalities that represent a verbal situation.

- Write a one-variable, two-step inequality that represents a situation.

- **Model and Solve Equations and Inequalities**
  - Explain that when solving an equation, it has to maintain balance.
  - Prove that my solutions make the equation equivalent on both sides.
  - Explain (written or verbally) what a solution to an equation or inequality represents
  - Model a one-variable, two-step equation and inequality
  - Describe how to solve a one-variable, two-step equation and inequality using models.
  - Make connections between using models and inverse operations
  - Solve one-variable, two-step equations and inequalities using inverse operations.
  - Solve equations and inequalities from real-world situations.
- **Geometric Applications of Equations**
  - Describe geometry concepts including sum of angles in a triangle, supplementary angles, complementary angles, adjacent angles, and vertical angles.
  - Set up an equation based on the geometry concepts
  - Solve the equation to determine the value of the variable
  - Solve the equation and then determine the value of the missing angle.

- **Circumference & Area of 2-D Figures**
  - **Circumference and Area of Circles**
    - Identify the radius, diameter, and circumference of the circle.
    - Determine the relationship of radius and diameter of a circle.
    - Understand that the relationship between the circumference of a circle and its diameter is a constant rate by comparing different size circles dimensions.
    - Define what Pi represents.
    - How to calculate circumference using pi.
    - Determine circumference when given radius or diameter of a circle.
    - Determine the circumference of a circle in real world application problems.
    - Decompose a circle into small triangular sections to make connections to the radius and circumference of a circle to the dimensions of a rectangle.
    - Use the connections to approximate the formula for area of a circle.
    - Apply the formula for area of a circle to solve real world application problems.
    - Determine the area of a circle.
    - Determine the difference between what area of a circle and circumference represents and identify which situations are circumference and which situations are area.
  - **Area of Composite Figures**
    - Decompose a composite shape into simple shapes such as square, rectangle, triangle, trapezoid, semi-circles, and quarter circles.
    - Identify the dimensions needed to find the area of the simple shapes.
    - Determine the area of a composite shape involving two or more simple shapes.
    - Solve application problems involving composite area.
    - Determine the reasonableness of the area calculated for the composite figure.
    - Determine the area of a shaded or unshaded region within a figure.
    - Determine the area of a composite figure on a coordinate grid by adding the area of the shapes that create the composite figure.
    - Determine the area of the composite figure on a coordinate grid by subtracting the area of the non-shaded part when drawing a rectangle (or other shape) around the figure
    - Model the area of a composite figure with an equation.

- **Volume & Surface Area of 3-D Figures**
  - **Surface Area**
    - Explain the relationships between surface area and area of composite shapes.
    - Solve problems involving surface area of rectangular prisms, rectangular pyramids, triangular prisms, and triangular pyramids.
    - Solve problems involving lateral surface are of rectangular prisms, rectangular pyramids, triangular prisms, and triangular pyramids.
    - Understand how the area formulas used when calculating composite area (of nets) are connected to the lateral and total surface area formulas of the 3D figures. (Composing and Decomposing)
    - Solve for the lateral/total surface area of a prism in a real-world situation.
    - Differentiate between the similarities and differences between lateral and total surface area in mathematical and real-world applications
    - Justify and explain the reasonableness of a solution (measurement of a dimension, lateral or total surface area) as it relates to the context within a real-world situation.
  - **Volume of 3-D Figures**
    - Identify whether a shape is a prism or a pyramid.
    - Explain the relationships between volume of prisms and pyramids and their relationship to their corresponding formulas.
    - Identify the base of the prism or pyramid.
    - Be able to identify the height of the prism or pyramid.
    - Identify the appropriate formula for the volume of the figure
    - Calculate volume of triangular prisms and pyramids when given pictures
    - Calculate the volume of rectangular prisms and pyramids when given pictures
    - Calculate a missing dimension when given the volume of a three-dimensional figure.
    - Solve application problems involving volume of rectangular and triangular prisms and pyramids.
    - Explain the connections between the dimensions of the net and its 3D figure and how they are used to calculate the volume of the figures.

- **Data & Probability**
  - **Foundations of Probability**
    - Identify and determine the possible outcomes for an event.
    - Create a list and/or a tree diagram to represent all outcomes for a simple event
    - Create a list and/or a tree diagram to represent all outcomes for a compound event.
    - Determine the total number of outcomes for an event based on the sample space created.
    - Determine which sample space is correct when provided with choices in different forms.
    - Use dice, spinners, cards, etc. to create a simulation for an event.
    - Use a simulation to create a sample space for an event.
  - **Determining Probability of Simple and Compound Events**
    - Understand and connect probability and ratios written as a fraction, decimal or percent.
    - Determine the difference between theoretical and experimental probability.
    - Use sample spaces to determine theoretical probability of simple events.
    - Use data to determine experimental probability of simple events.
    - Explain the relationship between probability of a simple event and its complement.

- Describe how to find the probability of a simple event.
- Use sample spaces to determine theoretical probability of compound events.
- Use data to determine experimental probability of compound events.
- Describe how to find the probability of a compound event.
- Explain the difference between independent and dependent compound events and identify whether two events are independent or dependent.
- Utilize simulations with or without technology to determine experimental probability.

- **Making Predictions with Simple and Compound Events**
  - Make predictions for simple and compound events based on experimental data
  - Make quantitative and qualitative predictions and comparisons of simple events
  - Make predictions using theoretical probability of simple and compound events

- **Data & Statistics**
  - **Comparing Categorical Data**
    - Read and understand the information represented in bar graphs, circle graphs, and dot plots.
    - Solve problems involving data from bar graphs.
    - Solve problems involving data from dot plots.
    - Solve problems involving circle graphs.
    - Identify part-to-whole comparisons and equivalencies in bar graphs, dot plots, and circle graphs.
    - Identify part-to-part comparisons and equivalencies in bar graphs, dot plots, and circle graphs.
    - Use part-to-part and part-to-whole comparisons and equivalencies to solve problems involving different forms of data.
  - **Comparing Numerical Data**
    - Interpret box and dot plots.
    - Determine measures of center in box plots and dot plots
    - Compare two sets of data in box plots by comparing their shapes, centers, and spreads.
  - **Making Inferences with Data**
    - Interpret bar graphs, circle graphs, dot plots, and box plots.
    - Understand and relate samples and their populations.
    - Make inferences about populations from random samples.
    - Make predictions from random samples of data using proportional reasoning.
    - Compare two populations based on data in random samples.
    - Make inferences about the differences between two populations based on random samples from the populations.

- **Financial Literacy**
  - **Taxes**
    - Calculate sales tax for a purchase
    - Calculate income tax based on given wages.
    - Understand and define sales tax and income tax.
    - Explain how different monetary incentives work and can be used.
    - Calculate final prices when using monetary incentives with or without sales tax.
    - Determine which monetary incentives provide the best deal.
  - **Personal Budget and Net Worth**
    - Identify the components of a family budget and different expenses that are included in each.
    - Calculate percentages of a budget that each category comprises of the total budget.

- Define and differentiate between fixed and variable expenses.
- Define and differentiate between assets and liabilities.
- Use knowledge of assets and liabilities to create a net worth statement.
- Determine how to improve different people's net worth when given scenarios.
- Use a family budget estimator to determine minimum hourly wage or salary needed to meet a family's needs.
- Compare minimum wages needed for family budgets when living in different cities and states.

- **Interest**
  - Calculate simple interest earned on different principal amounts over different time periods.
  - Calculate compound interest earned on different principal amounts over different time periods.
  - Explain the difference between simple and compound interest.
  - Compare simple and compound interest earnings for different principal amounts and over different time periods.

Grade 8 Math

- **Representing Real Numbers**
    - Define and understand a square root.
    - Determine the square root of a number.
    - Approximate the value of a square root using understanding of known perfect squares.
    - Approximate square roots and other irrational numbers using technology.
    - Define whole numbers, integers, and rational numbers.
    - Define irrational and real numbers.
    - Identify the difference between rational and irrational numbers.
    - Apply understanding of place value to compare and order real numbers.
    - Identify the location of real numbers, including the approximation of irrational numbers on a number line.
    - Order real numbers within mathematical and real-world context.
    - Understand the change in place value when converting between scientific notation and decimal notation is determined by the exponent.
    - Convert between standard decimal notation and scientific notation.
- **Applications of Pythagorean theorem**
    - Identify and define the parts of a right triangle.
        - o right angle
        - o legs
        - o hypotenuse
    - Understand that taking the side length to the second power produces the area of the square.
    - Explain the relationship between the squares formed by the legs and the hypotenuse.
    - Use a concrete manipulative or a pictorial representation to explain the Pythagorean Theorem.
    - Justify whether three measurements form a right triangle using a variety of methods, including the converse of Pythagorean Theorem.
    - Calculate missing measurements of right triangles in mathematical and real-world situations using the Pythagorean Theorem, models and diagrams.
- **Transformations and Similar Figures**
    - **Translations, Rotations, and Reflections**
        - Identify and define translations, rotations, and reflections.
        - Compare and contrast translations, rotations, and reflections.
        - Identify and define which transformations change congruence and orientation.
        - Model translations, rotations, and reflections using a coordinate grid.
        - Define the coordinates of a transformed image using a model.
        - Verbally explain the movement of a transformation.
        - Describe a transformation given an algebraic representation of a transformation. (e.g.. y+4 represents up four units).
        - Use an algebraic representation to model a transformed image.
    - **Dilations**
        - Explain the relationship between the corresponding side lengths of a pre-image and an image.
        - Generalize the ratio/scale factor of corresponding sides of similar figures.
        - Explain the relationship between the corresponding angle measures in a pre-image and an image of dilated figures. (Include angle-angle criterion).
        - Explain the multiplicative relationship when dilating a shape.
        - Identify the scale factor being multiplied to each coordinate pair of the pre-image in real world situations.

- Create an algebraic representation to prove a dilation.
- Use an algebraic representation to create a dilated image or list new coordinates.

- **Effects of Dilations**
  - Model the effect of dilation on linear and area measurements numerically and algebraically.
  - Analyze the effect on area after a shape has been dilated.
  - Analyze the effect on perimeter of a dilated shape.
  - Describe the effects of scale factor on perimeter/circumference of shapes.
  - Describe the effects of scale factor on the area of shapes.

- **Foundations for Linear Functions**
  - **Determining a Function**
    - Define a function in terms of dependent and independent variables.
    - Determine if a relation is a function from a set of ordered pairs.
    - Determine if a relation is a function from a table.
    - Determine if a relation is a function from a mapping.
    - Determine if a relation is a function from a graph.
  - **Finding Slopes**
    - Explain why the rate of change between two points on a line is the same for any two points on a line using similarity.
    - Use a graph of a proportional relationship to show the slope is the unit rate.
    - Determine the rate of change or slope from a table.
    - Determine the rate of change or slope from a graph.
    - Determine the slope in mathematical problems and real-world situations.
    - Describe the meaning of the slope in real world context.
  - **Proportional vs Non-Proportional Linear Relationships**
    - Represent proportional and non-proportional relationships using
      - a table
      - a graph
      - an equation, $y = kx$
    - Make connections between proportional and non-proportional relationships and situations represented by linear functions.
    - Determine if a relationship is proportional or non-proportional.
    - Determine the constant of variation in a direct variation problem.
    - Use the constant of variation in a direct variation problem to find the missing variable.
    - Use a proportion to solve a direct variation problem.
    - Make predictions using direct variation.
  - **Linear Functions in Slope - Intercept Form**
    - Given the slope and y-intercept of a linear function, write the equation in slope-intercept form.
    - Identify the slope and y-intercept from the graph of a linear function and write the equation in slope-intercept form.
    - Identify the slope and y-intercept from a table that represents a linear function and write the equation in slope intercept form.
    - Identify the slope and y-intercept from a verbal description that represents a linear function and write the equation in slope intercept form.
    - Make connections between different representations of a linear function.
    - Write the equation of a linear function that represents mathematical context.
    - Write the equation of a linear function that represents real world context.

- Identify the point of intersection of two graphed equations.
- Verify the x- and y- coordinate of the point of intersection satisfies both linear equations.

- **Making Predictions from Data**
  - **Mean Absolute Deviation and Random Samples**
    - Generate random data using simulation such as dice, cards, etc.
    - Generate random data using random number generators and simulators.
    - Make predictions about populations using what I know about random samples.
    - Determine the mean absolute deviation given a set of data.
    - Use mean absolute deviation to:
      - describe the spread of data
      - compare the variability of data
      - generate random samples with and without technology
  - **Scatter Plots and Making Predictions**
    - Determine if a graph models linear or non-linear relationships.
    - Determine the type of correlation, i.e., positive, negative, or no correlation.
    - Construct scatterplots without technology from a real-world context.
    - Construct scatterplots with technology from a real-world context.
    - Given a scatterplot, draw an appropriate trend line.
    - Using multiple representations, create a scatterplot with and without technology and draw an appropriate trend line.
    - Use a trend line to make predictions about the independent variable.
    - Use a trend line to make predictions about the dependent variable.
    - Explain how a linear model is used to make predictions from the data.

- **Equations and Inequalities**
  - **Representing Equations and Inequalities**
    - Understand and explain the similarities and differences between equations and inequalities in verbal and mathematical statements.
    - Identify which scenarios represent equations and which represent inequalities.
    - Write a real-world scenario when given an equation or an inequality.
    - Represent real world scenarios using a one variable equation/inequality with variables on both sides.
  - **Model and Solve Equations**
    - Set up and solve one variable equations in mathematical and real-world context with variables on both sides of the equal sign using:
      - concrete models
      - pictorial models
      - graphs
      - algebraic methods
    - Explain the meaning of solutions to equations.
    - Evaluate reasonableness of solutions after solving for the unknown.

- **Geometric Applications of Equations**
  - **Angles of Triangles**
    - Label remote interior angles and exterior angle when a line segment of a triangle is extended.
    - Explain the relationship between the remote interior angles of a triangle and its exterior

angle.
- Model with an equation the relationship between the sum of the remote interior angles in a triangle and its exterior angle.
- Find a missing value in a triangle using the relationship between the sum of the remote interior angles in a triangle and its exterior angle.

- **Parallel and Perpendicular Lines**
  - Understand the vocabulary related to the angle relationships when a line (transversal) intersects a pair of parallel lines.
  - Label the angles formed when parallel lines are cut by a transversal (vertical angles, corresponding angles, alternate exterior angles, alternate interior angles, same side interior angles, same side exterior angles, and linear pairs).
  - Explain the angle relationships formed when parallel lines are cut by a transversal.
  - Write equations based on angles relationships of parallel lines and a transversal and perpendicular lines.
  - Solve for a missing angle given a diagram of parallel lines cut by a transversal.
- **Surface Area**
  - Use a net that represents a prism or cylinder in a given situation, to assist with making connections between the lateral and total surface areas.
  - Explain the connections between the area of a net and the total and lateral surface area formulas of a prism/cylinder.
  - Understand which face(s) are bases and which measurements are height and slant height.
  - Understand how the surface area formula connects the height of the figure and the perimeter/circumference of the base shape is used to calculate the surfacearea.
  - Solve for lateral and total surface area in real world contexts involving rectangular prisms, triangular prisms, and cylinders.
  - Describe similarities and differences between lateral and total surface area in mathematical and real-world applications.
  - Justify and explain the reasonableness of a solution (measurement of a dimension, lateral or total surface area) as it relates to the context within a real - world situation.
- **Volume**
  - Explain the connections between the dimensions of the net and its 3D figure and how they are used to calculate the volume.
  - Understand the relationship between volume of a cylinder and cone.
  - Explain the connections between the formulas for calculating the volume of cones and cylinders.
  - Solve for volume of cones, cylinders, and spheres in a real-world situation.
  - Determine a missing measurement of a dimension given the volume.
  - Describe similarities and differences between volume formulas.
  - Justify and explain the reasonableness of a volume solution as it relates to the context within a real-world situation.

- **Financial Literacy**
  - **Savings**
    - Investigate various situations of spending habits.
    - Explain ways consumers spend/save money.
    - Explore the various types of investments and various variables when saving money.
    - Use an online banking calculator to compare earnings on savings.
    - Calculate simple/compound interest in real world financial situations.
    - Research the related costs of attending college.

- Estimate the amount for 2 or 4 years of college.
- Devise a realistic plan on how to save for the first year of college
- Research earnings for future career.
- Research colleges/schools' tuition and years attended to obtain appropriate degree.
- Compare income to monthly student loan payments to final pay off amount/time.

- **Borrowing Money and Methods of Payment**
  - Explore various options consumers have to borrow money.
  - Investigate and compare various types of interest rates consumers can pay lenders when repaying borrowed money.
  - Solve real world financial problems comparing how interest rates and loan lengths affect the total cost of borrowed money.
  - Use an online banking calculator to compare how interest rates and loan lengths affect the total cost of borrowed money.
  - Create a chart of the characteristics of various methods of payment.
  - Investigate and discuss the advantages and disadvantages of using various methods of payment.
  - Participate in a discussion on how consumers pay for needs/wants.
  - Solve real world problems on methods of payment.
- **Financially Responsible Decisions**
  - Identify and analyze characteristics of financially responsible and irresponsible decisions.
  - Identify and analyze real world financial scenarios.

- **Applications for Algebraic Reasoning**
  - **Linear Functions**
    - Draw similar right triangles to show the proportional relationship of any two points on a line (slope).
    - Prove that a linear relationship is non-proportional when the y-intercept is not zero.
    - Prove that a linear relationship is proportional when the y-intercept is zero.
    - Determine if a representation is a function or not a function.
    - Define a function as a relation in which each value from the set of independent quantities is associated with exactly one value from the set of dependent qualities.
    - Write equations in the form y = mx+b using a
      - table
      - graph
      - numerical description
      - verbal description
    - Write an equation in the form of y = mx+b from real world problems.
    - Determine slope and y-intercept from multiple representation in real world situations.
  - **Write, Model, and Solve Equations and Inequalities**
    - Understand and explain the similarities and differences between equations and inequalities in verbal and mathematical statements.
    - Identify which scenarios represent equations.
    - Identify which scenarios represent inequalities.
    - Represent real world scenarios using a one variable equation/inequality with variables on both sides.
    - Model and write one variable equations with variables on both sides of the equal sign using:
      - concrete and pictorial models

- o inverse operations
- o real world scenarios

- Solve one variable equations/inequalities with variables on both sides of the equal sign using:
  - o concrete and pictorial models
  - o inverse operations
  - o real world scenarios
  - o graphical representations

- **Coding with the TI Nspire**
  - Follow steps to understand the Program Editor function of my calculator.
  - Use arguments to give unknown variables a value.
  - Design a program and a function that appear to do the same thing.
  - Describe the difference between a program and a function.
  - Write my own program