

EIGHTH GRADE MATH

The student will use expressions and equations to model number relationships.

- a. Translate word phrases and sentences into expressions and equations and vice versa.
- b. Expressions
 - a. Simplify and evaluate linear, absolute value, rational and radical expressions.
 - b. Simplify polynomials by adding, subtracting or multiplying.

The student will use relations and functions to model number relationships.

- a. Relations and Functions
 - a. Distinguish between linear and nonlinear data.
 - b. Distinguish between relations and functions.
 - c. Identify dependent and independent variables, domain and range.
 - d. Evaluate a function using tables, equations or graphs.
- b. Recognize the parent graph of the functions $y = k$, $y = x$, $y = |x|$, and predict the effects of transformations on the parent graph (e.g., $y = |x| + 2$, change slope, change intercepts, change slope and intercept).
- c. Calculate the slope of a line using a graph, an equation, two points or a set of data points.
- d. Develop the equation of a line and graph linear relationships given the following:
 - a. slope and y-intercept
 - b. slope and one point on the line
 - c. two points on the line
 - d. x-intercept and y-intercept
 - e. a set of data points
- e. Slope Interpretation
 - a. Use the slope to differentiate between lines that are parallel, perpendicular, horizontal, or vertical.
 - b. Interpret the slope and intercepts within the context of everyday life (e.g., telephone charges based on base rate [y-intercept] plus rate per minute [slope]).
- f. Linear Equations and Inequalities
 - a. Solve linear equations by graphing or using properties of equality.
 - b. Solve linear inequalities by graphing or using properties of inequalities.
 - c. Match appropriate equations or inequalities (with 1 or 2 variables) to a graph, table, or situation and vice versa.
- g. Solve a system of linear equations by graphing, substitution or elimination.
- h. Problem Solving
 - a. Use the formulas from measurable attributes of geometric models (perimeter, circumference, area and volume), science, and statistics to solve problems within an algebraic context.
 - b. Solve two-step and three-step problems using concepts such as rules of exponents, probability, rate, distance, ratio and proportion, measures of central tendency and percent.
- i. Nonlinear Functions
 - a. Match exponential and quadratic functions to a table, graph or situation and vice versa.
 - b. Solve quadratic equations by graphing, factoring, or using the quadratic formula.

The student will use data analysis and statistics to formulate and justify predictions from a set of data.

- a. Data Analysis
 - a. Translate from one representation of data to another and understand that the data can be represented using a variety of tables, graphs, or symbols and that different modes of representation often convey different messages.
 - b. Make valid inferences, predictions, and/or arguments based on data from graphs, tables, and charts.
- b. Collect data involving two variables and display on a scatter plot; interpret results using a linear model/equation and identify whether the model/equation is a line best fit for the data (e.g., given a scatter plot and several linear equations, which one is the best fit?).

The student will use expressions and equations to model number relationships.

- a. Equations and Formulas
 - a. Translate word phrases and sentences into expressions and equations and vice versa.
 - b. Solve literal equations involving several variables for one variable in terms of the others
 - c. Use the formulas from measurable attributes of geometric models (perimeter, circumference, area and volume), science, and statistics to solve problems within an algebraic context.
 - d. Solve two-step and three-step problems using concepts such as rules of exponents, rate, distance, ratio and proportion, and percent.
- b. Expressions
 - a. Simplify and evaluate linear, absolute value, rational and radical expressions.
 - b. Simplify polynomials by adding, subtracting or multiplying.
 - c. Factor polynomial expressions

The student will use relations and functions to model number relationships.

- a. Relations and Functions
 - a. Distinguish between linear and nonlinear data.
 - b. Distinguish between relations and functions.
 - c. Identify dependent and independent variables, domain and range.
 - d. Evaluate a function using tables, equations or graphs.
- b. Linear Equations and Graphs
 - a. Solve linear equations by graphing or using properties of equality.
 - b. Recognize the parent graph of the functions $y = k$, $y = x$, $y = |x|$, and predict the effects of transformations on the parent graph.
 - c. Slope
 - i. *Calculate the slope of a line using a graph, an equation, two points or a set of data points.*
 - ii. *Use the slope to differentiate between lines that are parallel, perpendicular, horizontal, or vertical.*
 - iii. *Interpret the slope and intercepts within the context of everyday life (e.g., telephone charges based on base rate [y-intercept] plus rate per minute [slope]).*
 - d. Develop the equation of a line and graph linear relationships given the following: slope and y-intercept, slope and one point on the line, two points on the line, x-intercept and y-intercept, a set of data points.
 - e. Match appropriate equations to a graph, table, or situation and vice versa.
- c. Linear Inequalities and Graphs
 - a. Solve linear inequalities by graphing or using properties of inequalities.

- b. Match appropriate inequalities (with 1 or 2 variables) to a graph, table, or situation and vice versa.
- d. Solve a system of linear equations by graphing, substitution or elimination.
- e. Nonlinear Functions
 - a. Match exponential and quadratic functions to a table, graph or situation and vice versa.
 - b. Solve quadratic equations by graphing, factoring, or using the quadratic formula.

The student will use data analysis, probability and statistics to formulate and justify predictions from a set of data.

- a. Data Analysis
 - a. Translate from one representation of data to another and understand that the data can be represented using a variety of tables, graphs, or symbols and that different modes of representation often convey different messages.
 - b. Make valid inferences, predictions, and/or arguments based on data from graphs, tables, and charts.
 - c. Solve two-step and three-step problems using concepts such as probability and measures of central tendency.
- b. Collect data involving two variables and display on a scatter plot; interpret results using a linear model/equation and identify whether the model/equation is a line best fit for the data.