

Arithmetic I Activity Objectives

Activity Title	Mathematical Objectives
Australia by the Numbers: Working with Number and Place Value (p. 6)	Convert numbers in words into numbers in digits and vice versa Identify the place value of a given digit Round numbers
Borrowing Money: Working with Negative Integers (p. 10)	Add and subtract positive and negative integers Interpret the practical meaning of sums and differences of integers
Caring for Pets: Estimating by Rounding (p. 14)	Round numbers Estimate the difference of two numbers Estimate the product of two numbers
Coins in the United States: Working with Money (p. 18)	Add whole numbers Convert dollars to cents Determine which of two sums has greater value
Country Populations: Using Bar Graphs (p. 22)	Read data values from a bar graph Round numbers to the nearest integer Calculate the difference between two whole numbers Calculate the sum of two whole numbers
Fruit Snacks: Working with Averages (p. 26)	Find the average of a set of numbers Predict unknown results based on averages
Sharing Snacks: Dividing Whole Numbers (p. 30)	Divide a given number of items equally between a given number of groups Use long division to divide one integer by another Interpret the practical meaning of a fraction
Sharing Snacks #2: Dividing Whole Numbers (p. 34)	Use long division to divide one integer by another Interpret the practical meaning of a fraction Factor an integer into its prime factors Convert a percent into a fraction Determine the practical meaning of quotients and remainders
South Africa by the Numbers: Working with Number and Place Value (p. 38)	Convert numbers in words into numbers in digits Convert numbers in digits into numbers in words Identify the place value of a given digit Round numbers Find the difference of two whole numbers
Website Visitors: Using Bar Graphs (p. 42)	Read data values from a bar graph Round numbers to the nearest integer Calculate the sum and difference of two whole numbers

Calculus I Activity Objectives

Activity Title	Mathematical Objectives
Growing Money: Using Partial Derivatives (p. 6)	Find and evaluate the first partial derivatives of a multivariable function Interpret the practical meaning of partial derivatives
High School Students: Working with Rates of Change (p. 10)	Find and evaluate the derivative of a polynomial Use technology to determine relative extrema Estimate an inflection point from a graph Calculate and interpret the meaning of rates of change
Infant Growth Rates: Using Derivatives (p. 14)	Calculate the derivative of logarithmic and cubic functions Evaluate derivatives and interpret the meaning of the results Recognize the relationship between the slope of a graph and its derivative
Living with AIDS: Working with Derivatives (p. 18)	Interpret the practical meaning of the concavity of a graph Determine the sign of the first and second derivatives from a graph Find and evaluate the first and second derivatives of a quadratic function Estimate the derivative at a given value from a table
Movie Ticket Prices: Using Calculus to Analyze Change (p. 22)	Find, graph, and interpret the meaning of the derivative Shade the region representing the definite integral Calculate the area of a region represented by a definite integral Interpret the meaning of a definite integral Use an integral to find the average value of a function
PreK - Grade 8 Students: Working with Rates of Change (p. 26)	Find and evaluate the derivative of a cubic function Use the derivative to determine the slope of a function Estimate the coordinates of an inflection point from a graph Find the coordinates of an inflection point from an equation
Shipping Packages: Optimizing Functions with Calculus (p. 30)	Create a graphical representation of a verbal description Create a volume equation and calculate its derivative Determine the box dimensions that maximize volume
Shipping Packages #2: Optimizing Functions with Calculus (p. 34)	Create a graphical representation of a verbal description Create a volume equation and calculate its derivative Determine the box dimensions that minimize a volume function
Shipping Packages #3: Optimizing Functions with Calculus (p. 38)	Create a graphical representation of a verbal description Create a volume equation and calculate its derivative Determine the tube dimensions that maximize volume
Wind Chill Temperature: Using Calculus with Multivariable Functions (p. 42)	Evaluate a multivariable function at a given point Find and interpret the meaning of the first partial derivatives

Exponential and Logarithmic Functions I Activity Objectives

Activity Title	Mathematical Objectives
Credit Card Balance Transfer: Working with Financial Formulas (p. 6)	Use the present value of an annuity formula Solve exponential equations with logarithms Interpret graphs of functions
DVD Player Sales: Working with Logarithms (p. 10)	Solve an exponential equation with logarithms Find the inverse of an exponential model Evaluate and graph a logarithmic function
Government Employee Salaries: Working with Percentage Change (p. 14)	Calculate the average annual percentage change of a data set Determine average annual growth factors Solve exponential equations using logarithms
Living Longer: Using Exponential Function Models (p. 18)	Use regression to find an exponential model Interpret the meaning of the initial value and growth factor Solve an exponential equation with logarithms
Low Interest or Cash Back: Using Financial Formulas (p. 22)	Calculate the monthly payment from the annuity formula Solve an exponential equation with logarithms Evaluate an exponential function at a given value
Shopping Center Planning: Looking at Exponential and Linear Models (p. 26)	Find the growth factor of an exponential function from a table Create an exponential model for a data set algebraically Use regression to find a linear model Interpret the meaning of the slope of a linear function
The Bank Pays You: Using Compound Interest (p. 30)	Use the compound interest formula Solve a power function equation using rational exponents Find the annual percentage yield for a given interest rate
The Bank Pays You #2: Using Compound Interest (p. 34)	Use the compound interest formula Solve an exponential function with logarithms Solve a power function equation by using rational exponents Find the point of intersection of two exponential equations
The Cost of Living: Working with Exponential Models (p. 38)	Find the exponential growth factor from a verbal description Create an exponential model algebraically Evaluate an exponential equation at a given value
The Cost of Living #2: Working with Exponential Models (p. 42)	Find the exponential growth factor from a verbal description Create an exponential model algebraically Solve an exponential equation using logarithms

Fractions, Percents, Decimals I Activity Objectives

Activity Title	Mathematical Objectives
Baking Cakes: Multiplying Fractions (p. 6)	Multiply a whole number by a fraction Multiply two fractions Convert improper fractions into mixed numbers Add two fractions
Children Making Money: Working with Fractions (p. 10)	Create ratios Simplify fractions Compare two fractions and determine which is largest
Cooking in the Kitchen: Multiplying Fractions (p. 14)	Multiply and divide fractions Change units of measure through dimensional analysis
Cooking in the Kitchen #2: Multiplying and Dividing Fractions (p. 18)	Multiply and divide fractions Change units of measure through dimensional analysis
Counting Candy: Using Pie Charts (p. 22)	Create a pie chart to represent a data set Use a fraction to represent the shaded portion of a pie chart Convert a fraction to a percent Simplify a fraction
Measuring Milk: Changing Units of Measure (p. 26)	Change units of measure through dimensional analysis Multiply fractions Write improper fractions as mixed numbers
Pieces of Chocolate: Adding and Subtracting Fractions (p. 30)	Write a fraction that represents the shaded portion of a region Shade the portion of a figure that is represented by a fraction Add and subtract fractions with different denominators Write improper fractions as mixed numbers
Pieces of Chocolate #2: Adding and Subtracting Fractions (p. 34)	Write a fraction that represents the shaded portion of a region Shade the portion of a figure that is represented by a fraction Add and subtract fractions with different denominators
Shopping the Sale: Using Percents (p. 38)	Convert percents into decimals and vice versa Increase numbers by a constant percentage Solve linear equations Use ratios to find percents
The Cost of Homemade Bread: Working with Fractions, Decimals, and Units (p. 42)	Multiply two fractions Convert fractions to decimals Change units of measure using dimensional analysis

Fractions, Decimals, Percents II

Activity Title	Mathematical Objectives
Body Temperature: Adding and Subtracting Decimals (p. 6)	Add and subtract decimal numbers
College Basketball - Air Force: Working with Histograms (p. 10)	Create a frequency table Create a histogram from a frequency table Calculate percents Interpret the meaning of histograms
College Basketball - BYU: Working with Histograms (p. 14)	Create a frequency table Create a histogram from a frequency table Calculate percents Interpret the meaning of histograms
College Housing Costs: Using Ratios (p. 18)	Create fractions from a verbal description Simplify fractions Find the indicated fraction of a number Convert decimal numbers to percents
Exercise Activities: Working with Histograms (p. 22)	Create a frequency table and histogram Calculate percents Interpret the meaning of histograms Calculate an average
Real Estate Investing - Kansas City: Using Ratios to Analyze Deals (p. 26)	Calculate ratios in a real world context Interpret the meaning of ratios in a real world context Convert a fraction to a percent
Real Estate Investing - Las Vegas: Using Ratios to Analyze Deals (p. 30)	Calculate ratios in a real world context Interpret the meaning of ratios in a real world context Find the given percent of a number Convert a fraction to a percent
Real Estate Investing - Palm Beach: Using Ratios to Analyze Deals (p. 34)	Calculate ratios in a real world context Interpret the meaning of ratios in a real world context Convert a fraction to a percent
Sales Tax Changes: Working with Percents (p. 38)	Convert a percent to a decimal Create and solve a linear equation Multiply two numbers
Sizing Images: Using Ratios (p. 42)	Calculate the aspect ratio of an image Solve quadratic equations Solve equations involving ratios

Linear I Activity Objectives

Activity Title	Mathematical Objectives
Choosing a Cell Phone Plan - T-Mobile: Investigating Linear Functions (p. 6)	Create and evaluate linear function models Solve linear equations Use quantitative analysis to make a consumer decision
Choosing a Cell Phone Plan - Verizon: Investigating Linear Equations (p. 10)	Create and evaluate linear function models Solve linear equations Use quantitative analysis to make a consumer decision
College Graduates - Michigan: Using Linear Function Models (p. 14)	Interpret the real-world meaning of the slope of a line Solve linear equations and graph linear functions Find the point of intersection of two lines
Converting Temperatures: Solving Linear Equations (p. 18)	Evaluate a linear function and solve a linear equation Find the inverse of a linear function Create formulas to estimate unknown values
Government Nutrition Program - Alaska: Linear Function Modeling (p. 22)	Calculate an average rate of change Create a linear model Evaluate a linear function symbolically and graphically
Government Nutrition Program - Hawaii: Linear Function Modeling (p. 26)	Calculate an average rate of change Create a linear model Evaluate a linear function symbolically and graphically
Government Nutrition Program: Linear Function Modeling (p. 30)	Calculate an average rate of change Create a linear model Evaluate a linear function symbolically and graphically
Longer Life Spans: Using Linear Function Models (p. 34)	Determine what type of function best fits a scatter plot Use regression to find a linear model Interpret the practical meaning of the slope of a linear function Solve a linear equation and interpret the meaning of the result
Making Money: Working with Direct Proportionality (p. 38)	Create and graph a linear function model Determine if two quantities are directly proportional Compose two linear functions Use numerical results to make informed consumer decisions
Yahoo! Music Downloads: Working with Linear Equations (p. 42)	Determine the domain of a function Create a system of linear equations Interpret the practical meaning of a point of intersection Solve a system of equations

Linear II Activity Objectives

Activity Title	Mathematical Objectives
Counting Carbohydrates: Working with Linear Systems (p. 6)	Create a linear system of equations for a real-world context Graph linear functions Find the point of intersection of two lines Solve a system of linear equations
Investing in Entertainment: Using Linear Programming (p. 10)	Create a system of linear inequalities from a verbal description Graph the solution region of a system of linear inequalities Solve a linear programming problem
Investing in Fast Food: Using Linear Programming (p. 14)	Create a system of linear inequalities from a verbal description Graph the solution region of a system of linear inequalities Solve a linear programming problem
Owning Part of a Clothing Company: Using Linear Programming (p. 18)	Create a system of linear inequalities from a verbal description Graph the solution region of a system of linear inequalities Solve a linear programming problem
Selling Nuts: Using Linear Inequalities (p. 22)	Create and graph linear inequalities Find the point of intersection of two lines
Travel Options - California: Working with Linear Systems (p. 26)	Create and graph a linear function model Estimate a point of intersection from a graph of two lines Solve a system of linear equations algebraically
Travel Options - Florida: Working with Linear Systems (p. 30)	Create and graph a linear function model Estimate a point of intersection from a graph of two lines Solve a system of linear equations algebraically
Travel Options - Utah: Working with Linear Systems (p. 34)	Create and graph a linear function model Estimate a point of intersection from a graph of two lines Solve a system of linear equations algebraically
Using Resources Wisely: Investigating Linear Programming (p. 38)	Create a linear programming problem from a verbal description Graph the feasible region of a linear programming problem Find the corner points of a solution region Solve a linear programming problem
Using Resources Wisely #2: Investigating Linear Programming (p. 42)	Create a linear programming problem from a verbal description Graph the feasible region of a linear programming problem Find the corner points of a solution region Solve a linear programming problem

Quadratic Functions I Activity Objectives

Activity Title	Mathematical Objectives
Autism Awareness: Creating and Using Quadratic Models (p. 6)	Calculate and interpret the meaning of average rates of change Use rates of change to forecast unknown results Use regression to find a quadratic model
Autism Awareness: Solving Quadratic Equations (p. 10)	Evaluate a quadratic function model at a given value Solve a quadratic equation with the Quadratic Formula Find the x -intercepts and vertex of a parabola from its equation
Business Growth - USAA: Quadratic Function Modeling (p. 14)	Calculate and analyze trends in rates of change Draw a scatter plot of a data set Use regression to find a quadratic model Evaluate a quadratic function
Changing Population - Kentucky: Doing Data Analysis and Modeling (p. 18)	Determine if a linear or quadratic function best fits a data set Use regression to find a quadratic model Solve a quadratic equation with the Quadratic Formula
Changing Population - New York: Modeling with Quadratics (p. 22)	Explain the relationship between rates of change and concavity Determine if a linear or quadratic function best fits a data set Use regression to find a quadratic model Find the vertex of a quadratic function algebraically
Changing Population - South Carolina: Doing Data Analysis and Modeling (p. 26)	Determine if a linear or quadratic function best fits a data set Use regression to find a quadratic model Evaluate a quadratic function at a given value Solve a quadratic equation with the Quadratic Formula
Falling Objects - Empire State Building: Working with Quadratics (p. 30)	Use a quadratic model for the position of a falling object Create a linear equation for the velocity of a falling object Use the quadratic formula to find x -intercepts
Falling Objects - Sears Tower: Working with Quadratics (p. 34)	Use a quadratic model for the position of a falling object Create a linear equation for the velocity of a falling object Use the quadratic formula to find x -intercepts
United States Population: Using Quadratic Models (p. 38)	Solve a quadratic equation with the Quadratic Formula Evaluate a quadratic function at a given value Estimate the point of intersection of two graphs visually
Using the Body Mass Index Formula: Solving Equations (p. 42)	Evaluate a multivariable function at a given point Solve linear and quadratic equations

Periodic and Piecewise Functions I Activity Objectives

Activity Title	Mathematical Objectives
Cell Phone Plan Pricing -Verizon: Investigating Piecewise Functions (p. 6)	Create and graph a piecewise function model Evaluate a function at a given value from an equation or graph Use numerical results to make informed consumer decisions
Credit Card Balance Transfer #2: Working with Financial Formulas (p. 10)	Use annuity formulas to find the future value of an investment Create a piecewise function to model a real-world context Use numerical results to make informed consumer decisions
Credit Card Balance Transfer #3: Working with Financial Formulas (p. 14)	Use annuity formulas to find the future value of an investment Create and graph piecewise functions to model real-world data Use graphical results to make informed consumer decisions
Custom Greeting Cards: Working with Piecewise Functions (p. 18)	Create and graph a piecewise function model Evaluate a function at a given value from an equation or graph Use numerical results to make informed consumer decisions
Hours of Daylight - Anchorage: Working with Sinusoidal Models (p. 22)	Determine the periodic function that will best fit a scatter plot Calculate the midline and amplitude of a sinusoidal model Calculate the period of a periodic data set Create a sinusoidal model for a periodic data set algebraically
Hours of Daylight - Easter Island: Working with Sinusoidal Models (p. 26)	Determine the periodic function that will best fit a scatter plot Calculate the midline and amplitude of a sinusoidal model Calculate the period of a periodic data set Create a sinusoidal model for a periodic data set algebraically
Hours of Daylight - Perth: Working with Sinusoidal Models (p. 30)	Determine the periodic function that will best fit a scatter plot Calculate the midline and amplitude of a sinusoidal model Calculate the period of a periodic data set Create a sinusoidal model for a periodic data set algebraically
Hours of Daylight - Phoenix: Working with Sinusoidal Models (p. 34)	Determine the periodic function that will best fit a scatter plot Calculate the midline and amplitude of a sinusoidal model Calculate the period of a periodic data set Create a sinusoidal model for a periodic data set algebraically
Hours of Daylight: Using Inverse Trigonometric Functions (p. 38)	Use inverse trig functions to solve trigonometric equations Create a sinusoidal function model for a periodic data set
The Cost of Entertainment: Working with Piecewise Functions (p. 42)	Create and graph a piecewise function from a verbal description Evaluate a piecewise function at a given value Use numerical results to make informed consumer decisions

Polynomial, Power, Logisitic, Rational Functions I

Activity Title	Mathematical Objectives
Europe Population: Using Quadratic and Cubic Models (p. 6)	Determine which function type best fits a data set Use regression to find quadratic and cubic function models Graph polynomial functions Calculate first and second differences of a data set
Female Height and Weight: Using Power Function Models (p. 10)	Determine which function type best fits a scatter plot Use regression to find a power function model Convert from kilograms to pounds Convert from centimeters to inches
Gaining Weight: Using Logistic Function Models (p. 14)	Graph a logistic function Estimate an inflection point from a graph Interpret the real-world meaning of an inflection point
Growing Your Own Money: Working with Rules of Exponents (p. 18)	Multiply a number by a percent Divide one number by another Use rules of exponents to compare two exponential expressions
Growing Your Own Money #2: Working with Rules of Exponents (p. 22)	Multiply a number by a percent Divide one number by another Use rules of exponents to compare two exponential expressions
Make It Real Learning: Working with Function Models (p. 26)	Create a linear model from a verbal description Create a rational function model Evaluate linear and rational functions
Michigan Population: Modeling with Cubic Functions (p. 30)	Determine which function type best fits a data set Use regression to find a cubic function model Use a function model to forecast unknown results
Retail Market Analysis: Working with Rational Functions (p. 34)	Use regression to find a quadratic model Create a rational function Determine the practical domain for a function Evaluate a rational function at a given value
Social Security Concerns: Using Regression and Rational Functions (p. 38)	Use regression to find linear and quadratic models Create and graph a rational function model
Teen Pregnancy: Investigating Cubic Functions (p. 42)	Choose a mathematical model for a given scatter plot Use technology to find the point of intersection of two graphs Use a polynomial model to forecast unknown results

Sets, Probability, Statistics I Activity Objectives

Activity Title	Mathematical Objectives
Fruit Snacks: Using Mean, Median, and Mode (p. 6)	Calculate the mean, median, and mode of a data set Interpret the practical meaning of mean, median, and mode
Fruit Snacks: Using Probability (p. 10)	Determine the probability of an event
Kinds of Candy Bars: Working with Sets (p. 14)	Create a Venn diagram to represent a data set Find the intersection and union of a group of sets Find the complement of a set
Menu Choices: Working with Combinations (p. 18)	Use combinations to count different outcomes
Phone Numbers: Using Principles of Counting (p. 22)	Use combinations and permutations to count possible outcomes Calculate percentages
Picking Plates - Canada: Using Principles of Counting (p. 26)	Use permutations to count possible outcomes Use principles of counting
Picking Plates - United States: Using Permutations (p. 30)	Use permutations to count possible outcomes Use principles of counting
Playing Pig: Using Expected Value (p. 34)	Calculate expected value Use numerical results to determine a game strategy
Playing Soccer: Using Combinations and Probability (p. 38)	Use combinations to count different outcomes Calculate theoretical probabilities
Rolling the Dice: Using Probability (p. 42)	Calculate the probability of an event Calculate conditional probabilities Use probabilities to develop game strategy