

Understanding Rational Numbers

Lesson 1: Introduction to Rational Numbers and Basic Operations

Convert between repeating decimals and fractions. Convert between decimals and fractions or mixed numbers. Compare rational numbers. Put rational numbers in order. Understand reciprocals and multiplicative inverses. Add and subtract rational numbers. Solve word problems involving addition and subtraction of rational numbers. Apply addition and subtraction rules.

Lesson 2: Comprehensive Operations with Rational Numbers (Part 1)

Multiply rational numbers. Solve word problems involving multiplication of rational numbers. Apply multiplication rules.

Lesson 3: Comprehensive Operations with Rational Numbers (Part 2)

Divide rational numbers. Solve word problems involving division of rational numbers. Apply division rules. Evaluate numerical expressions involving rational numbers. Solve multi-step word problems involving rational numbers.

Exploring Exponents

Lesson 4: Introduction to Exponents

Students will develop a foundational understanding of exponents, learning how they represent repeated multiplication and their significance in mathematics.

Lesson 5: Evaluating Powers

Building upon their knowledge, students will learn to evaluate expressions involving exponents and apply this knowledge to solve equations with variable exponents.

Lesson 6: Working with Negative Exponents



Students will explore the concept of negative exponents, gaining proficiency in evaluating expressions that involve negative exponents.

Lesson 4: Operations with Integer Bases

In this lesson, students will learn to multiply and divide powers with integer bases, developing skills to simplify expressions efficiently.

Lesson 5: Exponents with Variable Bases

This lesson introduces the complexity of variable bases. Students will learn to multiply, divide, and apply powers with variable bases, enhancing their algebraic skills.

Mastering Scientific Notation

Lesson 6: Introduction to Scientific Notation

Students will learn the basics of scientific notation, including converting numbers between standard and scientific notation forms. They will understand the concept of powers of ten and its application in scientific notation.

Lesson 7: Using Scientific Notation on Calculators

This lesson focuses on practical skills. Students will learn how to perform calculations involving scientific notation using calculators. Emphasis will be placed on understanding calculator functions and interpreting results accurately.

Lesson 8: Operations with Scientific Notation

Students will delve into arithmetic operations with numbers written in scientific notation. They will learn to compare, add, subtract, multiply, and divide numbers efficiently, reinforcing their understanding of the scientific notation format.

Lesson 9: Problem-Solving with Scientific Notation

Applying their knowledge, students will solve real-world problems involving very large or small numbers. They will practice converting these numbers into scientific notation, perform necessary operations, and interpret the results within the context of the problem.



Exploring Square Roots and Cube Roots

Lesson 10: Square Roots of Perfect Squares

In this lesson, students will delve into square roots, focusing on perfect squares and their corresponding square roots. They will understand the concept of square roots, learn to calculate square roots of perfect squares, and recognize the patterns between numbers and their square roots.

Lesson 11: Positive and Negative Square Roots

Building upon their knowledge of square roots, students will explore both positive and negative square roots. They will learn to estimate positive and negative square roots, understand the relationship between squares and square roots, and apply this knowledge to real-life problems and equations.

Lesson 12: Cube Roots of Perfect Cubes

In this lesson, students will explore cube roots, with a focus on positive perfect cubes and their cube roots. They will learn to calculate cube roots and recognize the patterns between numbers and their cube roots. Real-life applications will be emphasized.

Lesson 13: Solving Equations with Cube Roots

This lesson will guide students through solving equations involving cube roots. They will learn strategies to isolate cube roots, solve cubic equations, and understand the practical significance of these solutions. Real-world scenarios will be used to reinforce learning.

Rational and Irrational Numbers

Lesson 14: Identifying Rational and Irrational Square Roots

In this lesson, students will learn to distinguish between rational and irrational square roots. They will identify common square roots and understand why some are rational while others are irrational.

Lesson 15: Classifying Numbers



Building upon their knowledge of square roots, students will classify numbers into rational and irrational categories. They will explore the properties and characteristics that differentiate these two types of numbers.

Lesson 16: Recognizing Irrational Numbers

Lesson Objective: This lesson will focus on recognizing irrational numbers and representing them on the number line. Students will work with various examples of irrational numbers and develop skills to identify them in real-life contexts.

Lesson 17: Rational Numbers and Number Lines

Lesson Objective: In this lesson, students will explore the representation of rational numbers on number lines. They will understand the relationship between rational and irrational numbers on the number line and apply this knowledge to solve problems involving both types of numbers.

Proportions in Mathematics

Lesson 18: Solving Proportions

In this lesson, students will learn to solve proportions, mastering the essential skills needed to find missing values in proportional relationships. They will gain proficiency in setting up and solving proportions effectively.

Lesson 19: Applying Proportions to Real-World Problems

Building upon their understanding of proportions, students will apply their knowledge to real-world scenarios. They will solve word problems that require setting up and solving proportions, enhancing their problem-solving skills and critical thinking.

Mastering Percents

Lesson 20: Understanding and Converting Percents

Learn the definition of percents and their representation as fractions and decimals. Practice converting between percents, fractions, and decimals. Understand how to compare and relate percents, fractions, and decimals.



Lesson 21: Using Percents in Real-World Scenarios

Discover how to find what percent one number is of another. Solve real-world problems involving finding percentages. Develop skills in estimating percentages of numbers and money amounts.

Lesson 22: Percent Change and Equations

Explore the concept of percent change and its importance. Solve percent change problems and word problems. Learn to find the original amount in percent change scenarios.

Practical Consumer Math

Lesson 23: Understanding Pricing and Discounts

Learn how price lists work and how to interpret them. Explore the concept of unit prices and their significance in making informed purchases. Understand unit prices with unit conversions, helping you compare products with different measurements. Calculate the total price based on unit prices and quantities. Practice finding percentages related to tax, discounts, and other aspects of pricing. Discover how to find the percent of a number in various consumer scenarios.

Lesson 24: Financial Decisions and Investments

Focus on calculating sale prices and finding the original prices of discounted items. Solve multi-step problems involving percentages to simulate real-world shopping situations. Explore estimating tips in restaurant scenarios. Learn about the concepts of simple and compound interest in financial contexts.

Units of Measurement Mastery

Lesson 25: Conversion within Customary and Metric Units

Learn how to convert between various customary units, such as length, weight, and capacity. Explore practical examples and scenarios where unit conversion is essential. Gain proficiency in converting rates and measurements between customary units.

Lesson 26: Temperature Conversion and Mixed Units

Understand the Celsius and Fahrenheit temperature scales and how to convert between them.



Explore the practical applications of temperature conversion in everyday life.
Learn how to handle mixed units, which involve combinations of both customary and metric units.

Mastering Expressions

Lesson 27: Writing and Evaluating Variable Expressions

Learn how to write variable expressions involving one operation.
Explore practical examples and real-world scenarios to understand the concept.
Develop the ability to evaluate one-variable expressions effectively.

Lesson 28: Advanced Variable Expressions and Coefficients

Expand your skills by writing variable expressions involving two or three operations.
Apply your knowledge to solve word problems using variable expressions.
Understand the significance of terms and coefficients in variable expressions.

Mastering Equivalent Expressions

Lesson 29: Understanding Basic Properties and Distributive Property

Explore the fundamental properties of addition and multiplication. Understand the distributive property and its role in multiplying expressions. Practice using the distributive property to simplify expressions effectively. Combine your understanding of basic properties and the distributive property to create equivalent expressions.

Lesson 30: Simplifying Expressions and Identifying Equivalencies

Learn techniques to simplify expressions with like terms. Explore factors of linear expressions and how they contribute to equivalency. Practice factoring and expanding linear expressions to identify equivalency. Develop proficiency in identifying equivalent linear expressions through guided examples and interactive exercises.

Solving Equations Mastery

Lesson 31: Foundations of Equations



Understand what equations are and how they represent relationships between values. Learn to identify and express equations in words. Practice creating equations from word descriptions and basic scenarios. Explore which values of "x" satisfy a given equation.

Lesson 32: One-Step and Two-Step Equations

Introduce one-step equations and learn to solve them. Progress to solving two-step equations involving addition, subtraction, multiplication, and division. Understand the properties of equality and how they guide equation solving. Solve one-step and two-step equations through guided examples and interactive exercises.

Lesson 33: Advanced Equation Solving

Extend equation solving to more complex scenarios: Equations involving like terms. Equations with variables on both sides, including those with fractional coefficients. Equations involving the distributive property. Tackle multi-step equations and gain proficiency in solving them. Create, solve, and analyze equations with no solutions or infinitely many solutions. Understand the number of solutions in various equation types.

Inequalities Mastery

Lesson 34: Foundations of Inequalities

Understand what inequalities represent and how they differ from equations. Learn to identify and express inequalities in words. Practice creating inequalities from word descriptions and basic scenarios. Explore the concept of solutions to inequalities.

Lesson 35: Inequalities on the Number Line

Introduce graphing inequalities on the number line. Learn to write inequalities from given number line representations. Solve one-step inequalities and graph their solutions on the number line. Explore graphing solutions to two-step and multi-step inequalities.

Lesson 36: Advanced Inequality Solving

Solve two-step inequalities and graph their solutions. Extend inequality solving to multi-step inequalities. Learn to solve inequalities with integers, including those with variables on both sides. Master solving inequalities with decimals, also featuring variables on both sides.



Mastering the Coordinate Plane

Lesson 37: Exploring the Coordinate Plane

Review the basics of the coordinate plane, including its components: x-axis, y-axis, and origin. Understand how coordinates are used to represent points in the plane. Practice identifying and plotting points in all four quadrants. Learn to label and interpret coordinates on the plane.

Exploring Lines and Angles

Lesson 38: Angle Relationships and Transversals

Identify and define key angle relationships, including complementary, supplementary, vertical, adjacent, and congruent angles. Learn how to find measures of these angles using given information. Explore the concept of transversals when two lines are intersected by a third line. Name angle pairs formed by transversals, such as alternate interior and exterior angles. Calculate angle measures and solve for unknowns using the properties of transversals.

Exploring Two-Dimensional Figures

Lesson 39: Classifying and Analyzing Polygons

Learn to identify and classify polygons based on their sides and angles. Focus on the properties and characteristics of different types of polygons.

Lesson 40: Triangles, Quadrilaterals, and Circles

Explore triangles, their types, and properties. Discuss quadrilaterals, trapezoids, and their classifications. Introduce key concepts related to circles, including parts of a circle and the properties of inscribed angles.

Transformations and Congruence

Lesson 41: Introduction to Transformations

Identify and understand the basic transformations: reflections, rotations, and translations. Describe how transformations change the position and orientation of figures.



Lesson 42: Translations and Reflections

Focus on translations: how to graph the image, find coordinates, and write the transformation rule. Explore reflections over the x- and y-axes: graphing, coordinate calculations, and transformation rules.

Lesson 43: Rotations and Transformation Sequences

Learn about rotations: graphing, finding coordinates, and writing transformation rules for rotations. Discuss sequences of transformations and how they can be used to achieve congruence between figures.

Lesson 44: Congruence and Corresponding Parts

Explore the concept of congruence and how to identify congruent figures. Understand congruence statements and corresponding parts, including side lengths and angle measures of congruent figures.

Transformations and Similarity

Lesson 45: Introduction to Similarity

Understand the concepts of similar and congruent figures. Explore the criteria for similarity and congruence between geometric shapes.

Lesson 46: Dilations and Scale Factor

Focus on dilations: graphing the image, finding coordinates, and determining the scale factor. Learn how dilations can create similar figures.

Lesson 47: Similar Triangles and Proportions

Identify similar triangles and explore the angle-angle criterion for similarity. Discuss side lengths and angle measures of similar triangles and figures. Understand how similar triangles can be used for indirect measurement and solving for missing side lengths in proportional triangles.

Pythagorean Theorem



Lesson 48: Understanding the Pythagorean Theorem

Introduce the Pythagorean Theorem and its significance in geometry. Teach students how to find the length of the hypotenuse using the theorem.

Lesson 49: Applications of the Pythagorean Theorem

Explore how the Pythagorean Theorem can be used to find the missing leg length of a right triangle. Provide examples and practice exercises for solving problems involving the theorem.

Three-Dimensional Figures

Lesson 50: Understanding Three-Dimensional Figures

Introduce students to the basic parts and characteristics of three-dimensional figures. Teach them about vertices, edges, and faces of common 3D shapes such as cubes, prisms, and pyramids.

Perimeter and Area

Lesson 51: Perimeter and Area Fundamentals

Define and explain the concepts of perimeter and area. Teach students how to calculate the perimeter of various shapes, including rectangles, triangles, and irregular polygons. Provide practice problems for finding perimeters.

Lesson 52: Advanced Area Concepts

Explore the concept of area in-depth, covering the area of rectangles, triangles, trapezoids, and irregular shapes. Teach students how to calculate the area of circles and composite figures. Provide real-world word problems that involve calculating area.

Surface Area and Volume

Lesson 53: Volume of 3D Shapes

Introduce the concept of volume in three-dimensional shapes, including cubes, prisms, and pyramids. Teach students how to calculate the volume of these basic shapes using appropriate formulas. Provide practice problems for finding volumes.



Lesson 54: Surface Area of 3D Shapes

Explain the concept of surface area in three-dimensional shapes, covering cubes, prisms, and pyramids. Teach students how to calculate the surface area of these shapes using appropriate formulas. Provide practice problems for finding surface areas.

Lesson 55: Advanced Topics in Surface Area and Volume

Explore more complex 3D shapes, including cylinders, cones, and spheres. Teach students how to calculate the volume and surface area of these shapes using relevant formulas. Provide real-world applications and word problems that involve volume and surface area calculations.

Proportional Relationships

Lesson 56: Introduction to Proportional Relationships

Define and explain what proportional relationships are. Introduce the concept of the constant of proportionality. Teach students how to find the constant of proportionality from a table.

Lesson 57: Representing Proportional Relationships

Show students how to write equations for proportional relationships based on data tables. Provide examples of real-world scenarios that involve proportional relationships. Include practice problems for writing equations.

Lesson 58: Graphical Representation of Proportional Relationships

Explain how proportional relationships can be identified through graphing. Teach students how to find the constant of proportionality from a graph. Show how to write equations for proportional relationships from graphed data. Explore different ways proportional relationships can be represented, emphasizing the importance of consistency in representations.

Direct Variation

Lesson 59: Introduction to Direct Variation

Define and explain the concept of direct variation. Teach students how to find the constant of variation in a direct variation relationship. Show how to identify direct variation in equations,



graphs, and real-world scenarios. Provide practice problems for writing and solving direct variation equations.

Understanding Slope

Lesson 60: Exploring Slope

Define and explain the concept of slope in the context of linear equations. Show how to find the slope from various representations: a graph, two points, a table of values. Teach students how to calculate the slope when given real-world scenarios. Provide practice problems for finding and using slope.

Mastering Linear Equations

Lesson 61: Understanding Solutions and Graphs

Explain how to determine if a given pair (x, y) is a solution to a linear equation. Relate the graph of a linear equation to its solutions. Practice identifying solutions and graphing equations.

Lesson 62: Slope-Intercept Form and Graphing Lines

Introduce slope-intercept form $(y = mx + b)$ and teach how to find the slope and y-intercept. Show how to graph a line using the slope-intercept form. Practice writing equations in slope-intercept form and graphing them.

Lesson 63: Point-Slope Form and Standard Form

Introduce point-slope form $(y - y_1 = m(x - x_1))$ and demonstrate how to write equations using a point and slope. Teach how to convert linear equations from standard form to slope-intercept form. Discuss and graph horizontal, vertical lines, as well as parallel and perpendicular lines. Practice writing equations in various forms and graphing lines.

Introduction to Functions

Lesson 64: Understanding Functions



Define what a function is and differentiate it from a relation. Provide examples of functions and non-functions. Discuss the vertical line test to identify functions graphically.

Lesson 65: Analyzing Functions through Graphs

Explore the graphical representation of functions. Teach students how to determine if a graph represents a function. Emphasize the concept of independent and dependent variables.

Lesson 66: Exploring Domain and Range

Define the domain and range of a function. Explain how to find the domain and range from graphs and equations. Offer practical examples to illustrate these concepts.

Exploring Linear Functions

Lesson 67: Understanding Linear Functions

Define linear functions and their characteristics. Learn how to evaluate linear functions for specific inputs. Understand the concept of slope and its significance in linear functions.

Lesson 68: Analyzing Linear Functions Graphically and Numerically

Complete tables of values for given linear functions. Graph linear functions using the provided data points. Interpret points on the graph in the context of the given problem.

Lesson 69: Writing and Comparing Linear Functions

Write linear functions from tables of values. Compare linear functions using graphs, equations, and tables. Solve real-world problems involving linear functions.

Nonlinear Functions

Lesson 70: Identifying Linear and Nonlinear Functions

Differentiate between linear and nonlinear functions using graphs and equations. Recognize patterns in nonlinear functions and their graphical representations.

Lesson 71: Evaluating Nonlinear Functions



Explore how to evaluate nonlinear functions for specific inputs. Solve real-world problems involving nonlinear functions.

Understanding Functions

Lesson 72: Rate of Change in Tables

Learn how to identify and interpret the rate of change from data presented in tables.

Lesson 73: Rate of Change in Graphs

Understand how to analyze and interpret the rate of change from graphs.

Lesson 74: Applying Graph Interpretation

Apply graph interpretation skills to solve real-world problems and scenarios. Sequences and Their Applications

Lesson 75: Introduction to Sequences

Understand the concept of sequences and distinguish between arithmetic and geometric sequences.

Lesson 76: Arithmetic Sequences

Dive into arithmetic sequences, exploring their properties and characteristics.

Lesson 77: Geometric Sequences

Lesson Objective: Explore the world of geometric sequences and their unique properties.

Lesson 78: Applying Sequences in Real Life

Apply the knowledge of sequences to solve word problems and real-life scenarios.

Solving Equations Together: Algebra



Lesson 79: The Solution Checker

Lesson Objective: In this lesson, students will learn to determine whether a given pair of (x, y) values satisfies a system of equations. This is the first step in understanding solutions to systems of equations.

Lesson 80: Graphical Solution Quest

Lesson Objective: Students will embark on a quest to solve systems of equations by graphing. They will visualize the intersection points and understand the concept of solution sets in a graphical context.

Lesson 81: Real-World Challenges: Graphing Systems

Lesson Objective: Building on the graphing experience, students will tackle word problems that require graphing systems of equations to find solutions in real-life scenarios.

Lesson 82: Classifying Solutions

Lesson Objective: Students will explore the different classifications of solutions in systems of equations. They will learn when to expect one solution, no solution, or infinitely many solutions by graphing.

Lesson 83: Substitution Success

Lesson Objective: This lesson introduces the method of substitution as a powerful tool for solving systems of equations. Students will learn how to apply it to various problems.

Lesson 84: Problem-Solving Masterclass

Lesson Objective: The final lesson empowers students to become problem-solving masters. They will learn to choose the most suitable method to solve systems of equations and apply their knowledge to word problems, bringing their algebraic journey to a satisfying conclusion.

Unveiling Data Insights(statistics)

Lesson 85: Mean, Median, Mode, and Range: The Data Basics



Lesson Objective: In this lesson, students will dive into the fundamentals of one-variable statistics. They will learn how to calculate the mean, median, mode, and range of a dataset, allowing them to summarize and interpret data effectively.

Lesson 86: Visualizing Data with Charts and Graphs

Building upon their knowledge, students will explore how to interpret charts and graphs to find measures of central tendency. They will develop the skills to analyze data visually, a crucial aspect of statistical understanding.

Lesson 87: Puzzle of Missing Numbers: Mean, Median, Mode, and Range

Lesson Objective: This lesson challenges students to apply their knowledge by solving problems involving missing data points. They will find the missing values of mean, median, mode, and range, honing their problem-solving skills.

Lesson 88: Beyond the Basics: Quartiles, Interquartile Range, and Outliers

Lesson Objective: Students will delve into more advanced statistical concepts. They will calculate quartiles and the interquartile range, as well as identify and understand the impact of outliers on datasets, allowing for a deeper exploration of data.

Two-Variable statistics

Lesson 89: The Story in Line Graphs

Students will explore the power of line graphs in revealing trends and patterns. They'll learn to interpret line graphs and understand the data they represent.

Lesson 90: Plotting with Scatter Plots

In this hands-on lesson, students will delve into scatter plots, discovering how to create them and interpret the data they hold.

Lesson 91 : Beyond the Dots: Trends and Predictions

Building on their knowledge of scatter plots, students will identify trends and use scatter plots to make predictions, applying mathematical reasoning to real-world scenarios.

Lesson 92: Fitting Lines to Data: The Lines of Best Fit



In the final lesson, students will learn how to identify and write equations for lines of best fit. They'll also apply their skills to word problems and gain insight into the importance of representative sampling.

Probability Unveiled

Lesson 93: The World of Simple Probabilities

Lesson Objective: In this lesson, students will delve into the foundations of probability by learning how to calculate the probability of simple events. They will gain a solid understanding of what probability means and how to express it mathematically.

Lesson 94: Unraveling Complex Probabilities

Building upon their understanding of simple probabilities, students will explore complex scenarios. They will learn about the probability of opposite, mutually exclusive, and overlapping events, enhancing their ability to handle more intricate probability problems.

Lesson 95: From Theory to Practice with Experimental Probability

Students will take their knowledge to the real world in this lesson by calculating experimental probability. They will learn how to conduct experiments and collect data to estimate probabilities, bridging the gap between theory and practical application.

Lesson 96: Investigating Two-Way Frequency Tables

This lesson introduces students to the use of two-way frequency tables for finding probabilities. They will learn how to extract information from these tables and make predictions based on the data.