Co-op offers both semester A & B courses for each Math core courses, exclusively for Co-op members.

MIDDLE SCHOOL COURSES/TITLES

Pre-Algebra (Both Semester A & B Included):

Semester A

Unit 1: Whole Numbers

In this unit, students will perform the four operations (addition, subtraction, multiplication, and division) on whole numbers. They will explore the properties of whole numbers by comparing and ordering them, estimating, practicing special divisibility rules, and working with the commutative, associative, and distributive properties. They will also solve problems involving whole numbers and the operations.

Unit 2: Fractions

In this unit, students will perform the four basic operations on fractions, as well as find the factors, prime factors, and greatest common factors of numbers in order to perform those operations. They will also find reciprocals and simplify fractions, as well as compare and order fractions and solve problems involving fractions.

Unit 3: Decimals

This unit starts with decimal concepts such as place value and connections between decimals and fractions and whole numbers. Students will also perform the four basic operations on decimal numbers and will explore repeating decimals, rational and irrational numbers, mental math techniques with whole numbers and decimals, and will solve problems with decimal numbers.

Unit 4: Ratios and Proportions, Percents, and Measurement

This unit starts by introducing the concept of percent and how it relates to fractions and decimals. It allows students to calculate percents (i.e., finding the percent of a whole or decimal number), find percent increases and decreases, solve problems with percents, and use mental math with fractions and percents. Students will then explore ratios and proportions, find proportions, and work with scaling and proportion. Students will also work with units of length, capacity, and weight and mass, and convert between Celsius and Fahrenheit temperatures.

Semester B (Pre-Algebra)

Unit 1: Integers

In this unit, students explore the basic concepts of integers, including addition, subtraction, multiplication, and division. Students also learn about expressing integers in exponential and expanded forms, finding square roots of perfect and imperfect squares, writing numbers in scientific notation, and solving word problems with integers.

Unit 2: Geometry

In this unit, students explore the meaning of lines, angles, and planes, as well as types of polygons and types of solid figures. They also explore special types of angles and triangles, including right triangles and the Pythagorean Theorem. They find circumference and perimeter, area of polygons and circles, volume, and surface area. They distinguish parallel and perpendicular lines, congruent and similar figures, and explore transformations such as translations and rotations, as well as tessellations.

Unit 3: Statistics and Graphs

In this unit, students focus on statistical tools such as bar graphs, line graphs, scatter plots, and central tendencies. Students also learn about conducting surveys and experiments to collect data as well as determining probability of an event and a chance experiment. Additionally, they explore ways to critically analyze data and find trends in data.

Unit 4: Expressions, Equations, and Inequalities

In this unit, students use the order of operations to evaluate expressions, perform operations on monomials and binomials, solve linear equations and inequalities, graph linear equations, and find slopes and y-intercepts.

Unit 4: Research Project

Learners use conventions in grammar and spelling as they conduct an in-depth research project by following the writer's workshop process.

Algebra I (Both Semester A & B Included):

Semester A

Unit 1: Rational Numbers, Exponents, and Square Roots

Students are provided with opportunities to place exponents in different forms, as well as review basic rules of exponents. Included are tutorials and applications where students can add, subtract, multiply and divide integers, as well as review their additive inverses; find the square roots of perfect and imperfect squares; and perform several operations on fractions, including converting to decimals and percents.

Unit 2: Percents and Expressions

In This unit, students are provided the opportunity to solve problems with percents; including but not limited to, converting percents to decimals. Students will also use the order of operations to simplify expressions with one or more variables, as well as add, subtract, multiply, and divide monomials and binomials individually and collectively.

Unit 3: Linear and Quadratic Equations

Students will have the opportunity to use several methods to solve linear equations and quadratic equations. They will also understand the relationship between lines, ordered pairs, and the coordinate plane.

Unit 4: Linear Relations, Systems, Functions, and Special Topics

Students will have the opportunity review linear relations by approximating the line of best fit, using the distance formula and the midpoint formula. They will also solve and graph linear equalities and inequalities, systems of equations, and inequalities.

Semester B (Algebra I)

Unit 1: Rational Numbers, Exponents, Radicals, and Sets

Students will perform the four basic operations on fractions and integers, as well as identify the additive inverse of integers and the multiplicative inverse of fractions. They will review the basic concept of sets, as well as their intersections and unions. They will also apply the rules for exponents (both positive and negative) and perform operations on radical expressions.

Unit 2: Polynomials and Factoring

Students will perform the four basic operations: find the products and roots of monomials, as well as the sum and difference. They will also simplify and factor polynomials.

Unit 3: Linear Equations, Linear Inequalities, and Quadratic Equations

Students solve simple and difficult linear equations in one variable, as well as linear inequalities and systems of equations using a variety of methods. They will also solve quadratic equations by factoring.

Consumer Mathematics:

Unit 1: Mathematics Review

This unit covers approximately three weeks of instruction. It explains how four basic mathematical operations—addition, subtraction, multiplication, and division— can be used to solve real-life problems. It discusses how calculators simplify the process of solving such problems. Because students will come across situations in this course in which they will have to use fractions, decimals, and percentages, this section talks about the relationships between those elements and explains how they should be solved.

Unit 2: Consumer Mathematics Skills

This unit covers approximately two weeks of instruction. It presents the factors that decide the cost and price of an item and discusses how paying sales tax and discounts affect the total price of an item. This unit also explains how to calculate sales tax and consumer discounts. In addition, it explains the necessity of giving tips to certain service providers and offers guidelines for determining the amount of a tip.

Unit 3: Wages, Income Tax, and Money Management

This unit covers approximately two to three weeks of instruction. Once students start earning their own money, they will need to understand various options available to manage it. This unit will teach students how to correctly interpret a paycheck and understand paycheck deductions. It also presents the importance of paying taxes, the requirements for filing income tax returns, and the steps involved in calculating tax. This unit explains how students can regulate their income and expenditures by creating and following a budget. It discusses how they can use checking and savings accounts to protect and manage their money. It also shows how they can increase their money and plan a financially secure future by choosing a good investment strategy.

Unit 4: Interest and Credit

This unit covers approximately two to three weeks of instruction. It deals with obtaining and repaying loans, as well as the various types of interest on loans and how interest is calculated. This unit also discusses the concept of credit, including how credit should be correctly used and managed and how building a good credit history has important benefits.

Unit 5: Large Purchases

This unit covers approximately two weeks of instruction. It will help students make important decisions about buying or leasing a car and buying or renting a home. It presents the factors student should consider—such as costs, requirements, and personal preferences—that will help them make an informed choice. This unit also discusses the importance of insurance, different types of insurance, and how different insurance plans suit different purposes.

Unit 6: Economics and Finance

This unit covers approximately two weeks of instruction. It explores how economics affects society, from a personal to a global level. This unit addresses the relevance of economic principles in everyday life and why we should be aware of them. It describes the concept of supply and demand and explains how the relationship between supply and demand affects the price we pay for goods and services. On a larger scale, this unit presents the economic indicators that describe a nation's economy. It also explains how the interaction between nations through international trade affects the global economy.

Math Supplemental Pack (Middle School):

(Includes 6 titles listed below)

Math Expeditions E-I

For elementary and middle school students; Skills typically taught in grades K–8; 347 hours of instruction; 400 discrete learning objectives; Optional audio available.

Learners connect math concepts to real world situations. They become members of realistic interdisciplinary expeditions in which math concepts are connected to science, environmental science, social studies, geography, and history. They master basic math skills as they enhance their mental math, estimation, and problem-solving skills. Online manipulatives and math tools provide hands-on learning. Reproducible student activity worksheets are included to reinforce skills for grades 3–6.

Foundational Mathematics

For middle school, high school and adult learners; Skills typically taught in grades K-7. Foundational Math helps middle school, high school and adult learners obtain math skill typically acquired in elementary school.

Math Problem Solving

For middle, high school, and adult learners; Skills typically taught in grades 3–12. 57 hours of instruction; optional audio available. Nineteen interactive scenarios encourage learners to explore and apply mathematical concepts from basic computation to advanced algebra as they solve multi-step problems in a real-life context. Learners select tools such as tables, graph makers, and equation builders, using various levels of assistance to explore and solve the problems.

Algebra 1, Part 1

For middle, high school, and adult learners; Skills typically taught in grades 6–9; 98 hours of instruction; 74 discrete learning objectives; Optional audio available. This pre-algebra curriculum teaches students the foundation skills they need to understand and apply algebraic concepts.

Algebra 1, Part 2

For middle, high school, and adult learners; Skills typically taught in grades 6–10; 96 hours of instruction; 72 discrete learning objectives; Optional audio available. Building on the essential skills learned in PLATO Algebra 1, Part 1, students continue with instruction and practice on sets and numbers, polynomials and factoring, and equations and inequalities

Miscellaneous Math Resource

Covers topics like Data Collection (including Cause & Effect Diagrams and using data collection tools); Charting and Graphing (including Scatter Diagrams, Histograms, and Basic Statistics); and Control Charts (including Control Chart Basics, Completing Control Charts, and Using Control Charts).

HIGH SCHOOL COURSES/TITLES

Algebra I (Both Semester A & B Included):

Semester A

Unit 1: Rational Numbers, Exponents, and Square Roots

Students are provided with opportunities to place exponents in different forms, as well as review basic rules of exponents. Included are tutorials and applications where students can add, subtract, multiply and divide integers, as well as review their additive inverses; find the square roots of perfect and imperfect squares; and perform several operations on fractions, including converting to decimals and percents.

Unit 2: Percents and Expressions

In This unit, students are provided the opportunity to solve problems with percents; including but not limited to, converting percents to decimals. Students will also use the order of operations to simplify expressions with one or more variables, as well as add, subtract, multiply, and divide monomials and binomials individually and collectively.

Unit 3: Linear and Quadratic Equations

Students will have the opportunity to use several methods to solve linear equations and quadratic equations. They will also understand the relationship between lines, ordered pairs, and the coordinate plane.

Unit 4: Linear Relations, Systems, Functions, and Special Topics

Students will have the opportunity review linear relations by approximating the line of best fit, using the distance formula and the midpoint formula. They will also solve and graph linear equalities and inequalities, systems of equations, and inequalities.

Semester B (Algebra I)

Unit 1: Rational Numbers, Exponents, Radicals, and Sets

Students will perform the four basic operations on fractions and integers, as well as identify the additive inverse of integers and the multiplicative inverse of fractions. They will review the basic concept of sets, as well as their intersections and unions. They will also apply the rules for exponents (both positive and negative) and perform operations on radical expressions.

Unit 2: Polynomials and Factoring

Students will perform the four basic operations: find the products and roots of monomials, as well as the sum and difference. They will also simplify and factor polynomials.

Unit 3: Linear Equations, Linear Inequalities, and Quadratic Equations

Students solve simple and difficult linear equations in one variable, as well as linear inequalities and systems of equations using a variety of methods. They will also solve quadratic equations by factoring.

Algebra 2 (Both Semester A & B Included):

Semester A

Unit 1: Rational Expressions

Students will use the four basic operations on rational expressions, as well as evaluate, simplify and find their equivalent forms.

Unit 2: Coordinate Plane

Students will utilize the coordinate plane to: identify the location of points; graph ordered pairs, equations, and inequalities; describe solutions to linear equations; find (and compare) the slope, as well as identify the y-intercept of a line; and write the linear equation in a variety of forms.

Unit 3: Systems, Probability, and Vectors

Students will solve systems of equations by substitution, addition, and graphing. They will also solve systems of linear equations in two and three variables by using matrices, as well as solve linear-quadratic equations. In addition, they will determine the probability of an event and classify it as independent, dependent, or mutually exclusive.

Semester B (Algebra 2)

Unit 1: Rational Expressions, Factoring, Equations, and Inequalities

Students will have the opportunity to apply the rules for exponents when the exponents are rational numbers, as well as rationalizing the denominator, and manipulating rational expressions in a variety of ways. In This unit, they will also use interval notation to describe solution sets for equations with absolute values and inequalities.

Unit 2: Conic Sections, Functions, and Special Topics

The student will have the opportunity to review conic sections, functions and other special topics, included by not limited to: direct, inverse, and joint variation; piece-wise functions and joint functions.

Unit 3: Special Functions, Complex Numbers, and Sequences and Series

Students will have the opportunity to explore exponential and logarithmic functions by recognizing the properties and graphs and solving problems for each. They will also review both arithmetic and geometric series and sequences.

Geometry (Both Semester A & B Included):

Semester A

Unit 1: Geometry Basics, Points, Lines, Planes, and Angles

This unit focuses on geometric problem-solving strategies, reasoning, conjectures, and the history of geometric systems. The unit also explores elements of geometry, including points, lines, planes, and angles.

Unit 2: Parallel and Perpendicular Lines and Triangles

This unit focuses primarily on parallel and perpendicular lines, special angles, and triangles. Learners also write geometric proofs and explore congruence and inequality.

Unit 3: Polygons and Area

This unit focuses on a variety of geometric shapes, including quadrilaterals, squares, rectangles, rhombi, parallelograms, trapezoids, and triangles. Learners compute area for a variety of shapes.

Unit 4: Solid Figures and Volume

This unit focuses on solid figures, such as prisms, spheres, and polyhedra. Learners practice visualizing and finding the area and volume of three-dimensional objects.

Semester B (Geometry)

Unit 1: Geometry of the Right Triangle and Right Triangle Trigonometry

This unit focuses on solving problems using right angles. Learners will use the Pythagorean Theorem and various trigonometric functions.

Unit 2: Similarity, Congruency, and Transformations

This unit focuses primarily on geometric transformations, including congruence, similarity, symmetry, translations, and rotations. Learners will also use ratio and proportion and explore translations in real world situations.

Unit 3: Circles

This unit focuses on the properties and attributes of circles, including arcs, chords, and angles. Learners also calculate area and circumference of circles.

Unit 4: Geometry of the Coordinate Plane

This unit focuses on coordinate planes, including length, midpoint, slope, vectors, and transformations on a plane. Learners will use a variety of problem-solving strategies.

Pre-Calculus (Both Semester A & B Included):

Semester A

Unit 1: Equations and Inequalities

This unit provides the conceptual understanding of equations and inequalities. It begins by identifying different types of equations and inequalities and methods of solving them. It then explores linear equations in one and two variables and how to solve for a given variable. This unit also includes inequalities and how to solve for and represent their answers. The unit concludes by exploring absolute value equations and complex numbers and the correct steps to solve for them, as well as the three equation types, radical, rational, and power equations. This unit is essential in precalculus because it is a building block for later units.

Unit 2: Graphs

This unit provides a basic understanding and application of graphs. The unit starts with the coordinate system and reviews how to graph equations. It shows how, given two graphed points, you can find the distance, midpoint, and equations of lines. It goes on to explain linear equations and their applications in-depth. It concludes by explaining linear regression, which allows for multiple points of data to be included when finding a linear equation that represents a set of data.

Unit 3: Functions and Their Graphs

This unit introduces the concept of functions, a core concept in precalculus. The rest of the course will be based on functions and function notation. The unit begins by describing functions in terms of their graphs and how transformations produce changes in the graphs. The unit shows how to combine functions and find inverse functions. It also presents many real-world applications of functions, showing how to represent them as functions and solve them both mathematically and graphically.

Unit 4: Polynomial and Rational Functions

This unit is important in precalculus because it extends students' previous knowledge of quadratic functions into the realm of polynomial and rational functions, whose solutions require a variety of methods of factoring and finding roots. It then explains how to graph these functions, both by hand and with the use of a calculator. This unit concludes with how to solve polynomial and rational inequalities. This unit will allow students to work through many real-world examples based on polynomial and rational functions.

Unit 5: Exponential and Logarithmic Functions

This unit is important in precalculus because many real-world problems can be explained and solved using exponential and logarithmic functions. The unit begins by introducing the basic forms of these functions and explaining how to solve for and graph them. It then discusses how to apply the functions to real-world situations and solve them. Overall, this unit covers how to recognize, write, and graph various exponential and logarithmic functions and use their properties to manipulate expressions and solve equations.

Unit 6: Trigonometric Functions

In this unit, students learn about one of the key concepts in precalculus, trigonometry. This unit introduces the trigonometric functions by describing the interrelationships between the unit circle, angles, and their relationship to the Cartesian plane. This unit begins by reviewing some basic concepts relating to angles and expands to include the unit circle and trigonometric functions. It then covers the definition, description, and illustration of the key concepts of the trigonometric functions, including their relationship to angles, the unit circle, right triangles, graphs, periodic functions, and inverse trigonometric functions.

Semester B (Pre-Calculus)

Unit 1: Trigonometric Identities and Conditional Equations

This unit provides the conceptual understanding of trigonometricidentities and conditional equations. It begins by examining the basic trigonometric identities and using them for simplifying expressions or solving equations. It explores identities that describe some of the relationships between functions and angles, and then expands on the relationships between multiple angles within trigonometric functions. This unit also looks at the product-sum and sum-product identities. The unit concludes by exploring techniques used to solve trigonometric equations

Unit 2: Applications of Trigonometry

This unit covers additional topics in trigonometry and their applications. The unit starts with the laws of sine and cosine and their applications. It then introduces vectors and applications of vectors to real-life problems. This unit also explores the polar coordinate system and shows how to graph complex numbers. It concludes by explaining conversion of complex numbers to trigonometric forms and using DeMoivre's theorem for finding roots of complex numbers.

Unit 3: Matrices and Systems of Equations and Inequalities

This unit introduces the concept of matrices. It begins by exploring methods of solving both linear and nonlinear systems of equations. The unit then leads into the introduction of matrices as a way to solve for systems of equations. The unit examines the various terms used to describe matrices and their properties, as well as how to add, subtract, and multiply matrices. The unit covers inverse matrices and their real-life applications. It also explores the methods for graphing and solving systems of linear inequalities and concludes with solving linear programming problems.

Unit 4: Analytic Geometry: Conic Section

This unit introduces and explores the conic sections. The unit starts with the introduction of each conic—the parabola, the circle, the ellipse, and the hyperbola. The unit examines the conic sections, their standard forms, graphs, and real-life applications. Then the unit covers the conics in more depth by explaining the translation and rotation of the coordinate axes. The unit concludes with solving the parametric form of equations and also covers their real-life applications.

Unit 5: Sequences, Induction, and Probability

This unit brings together the topics of sequences, induction, and probability. The unit begins by introducing sequences and series and explores the various types of sequences. The unit then transfers to mathematical induction as a method of finding proofs. Lastly, the unit investigates probability, including permutations and combinations, and basic statistics involved with probability. This unit is important in precalculus because many real-world situations involve sequences and probabilities.

Unit 6: Limits: Introduction to Calculus

This unit serves as a bridge from precalculus to calculus by introducing the fundamental concepts used **in** calculus, specifically limits, derivatives, and integrals. The unit begins by introducing the concept of a limit, and describes an iterative process to estimate limits using a table of values. The unit then explores limits in more depth, describing some basic arithmetic properties, as well as how to use limits to determine the continuity of a function. Lastly, the unit introduces derivatives by determining the slope of a tangent line at a point, and integrals by finding the area under a curve.

Math Supplemental Pack (High School):

(Includes 10 titles listed below)

Math Problem Solving

For middle, high school, and adult learners; Skills typically taught in grades 3–12. 57 hours of instruction; optional audio available. Nineteen interactive scenarios encourage learners to explore and apply mathematical concepts from basic computation to advanced algebra as they solve multi-step problems in a real-life context. Learners select tools such as tables, graph makers, and equation builders, using various levels of assistance to explore and solve the problems.

Algebra 1, Part 1

For middle, high school, and adult learners; Skills typically taught in grades 6–9; 98 hours of instruction; 74 discrete learning objectives; Optional audio available. This pre-algebra curriculum teaches students the foundation skills they need to understand and apply algebraic concepts.

Algebra 1, Part 2

For middle, high school, and adult learners; Skills typically taught in grades 6–10; 96 hours of instruction; 72 discrete learning objectives; Optional audio available. Building on the essential skills learned in PLATO Algebra 1, Part 1, students continue with instruction and practice on sets and numbers, polynomials and factoring, and equations and inequalities

Geometry 1 & 2 (2 titles)

Geometry 1 topics include: Special Angles Part 1 & 2; Circles, Arcs, & Circumferences; Pythagorean Theorem 1; and Using Geometry. Measurement topics: Metric Measurement; Area Part 1 & 2; Volume, and Using Measurement.

Geometry 2 topics include: Intro to Geometry; Triangles & Lines; Polygons; Transformations, Symmetry, and more.

Algebra 2, Part 1 & 2 (2 titles)

Section 1 includes: Rational Expressions; Graphs & Linear Equations; Probability, Vectors and more.

Section 2 includes: Numbers & Their Properties; Special Equations & Inequalities; Coordinates & Curves; Functions, and more.

Consumer Mathematics

Sections include: Mathematics Review; Consumer Mathematics Skills; Wages, Income Tax, Money Management; Interest and Credit, Finance, and more.

Trigonometry Skills

Designed to cover material taught at the college level. Learners studying this curriculum should have completed three years of high school mathematics (two years of algebra and one year of geometry). Trigonometry provides the computational and conceptual framework for courses in calculus, finite mathematics, computer sciences, economics, business, and other areas.

Miscellaneous Math Resource

Covers topics like Data Collection (including Cause & Effect Diagrams and using data collection tools); Charting and Graphing (including Scatter Diagrams, Histograms, and Basic Statistics); and Control Charts (including Control Chart Basics, Completing Control Charts, and Using Control Charts).