

Course Description: Integrated Math 3 builds on students' understanding of algebra, geometry, statistics, and functions by exploring increasingly sophisticated mathematical concepts and their real-world applications. Students deepen their ability to reason mathematically, model complex situations, and communicate solutions using multiple representations, including equations, graphs, tables, and geometric models. Throughout the course, learners strengthen problem-solving skills while making connections among mathematical concepts that are traditionally taught as separate subjects.

The course begins with a review of essential algebraic concepts before extending student learning to polynomial, logarithmic, rational, and trigonometric functions. Students investigate quadratic and polynomial equations, sequences and series, probability and statistics, geometric transformations, congruence and similarity, trigonometric ratios, conic sections, area, and volume. They develop fluency in solving mathematical problems analytically and graphically while using mathematical models to analyze patterns, make predictions, and justify conclusions.

Emphasis is placed on mathematical reasoning, precision, and perseverance as students apply mathematics to authentic contexts. Through inquiry-based learning, modeling activities, and technology-enhanced instruction, students build the knowledge and skills needed for higher-level mathematics, including Precalculus and Calculus, as well as college, career, and technical pathways that require advanced quantitative reasoning. The course aligns with state and national mathematics standards and prepares students to confidently solve complex problems across a variety of mathematical domains.

Module	Lesson Title	Objectives
Module 7 Probability & Statistics	7.1 Counting Methods	Find the total number of outcomes using various methods, such as tree diagram, Fundamental Counting Principle, permutations, combinations.
	7.2 Types of Probabilities	- Find theoretical and experimental probabilities. - Find compound probabilities.
	7.3 Independent & Dependent Events	- Determine probabilities of independent and dependent events. - Use two-way frequency tables to find conditional probabilities.

Module	Lesson Title	Objectives
	7.4 Data Distributions	- Use shapes of distributions to choose appropriate statistics. - Use shapes of distributions to compare data.
	7.5 Probability Distributions	- Identify random variables. - Construct a theoretical probability distribution. - Construct an experimental probability distribution.
	7.6 Analyzing Distributions	- Analyze a probability distribution by finding its expected value. - Analyze a probability distribution by finding the standard deviation.
	7.7 Binomial Distribution	Find probabilities using binomial distribution.
	7.8 Normal Distribution	- Use the Empirical Rule to analyze normal distribution. - Apply the standard normal distribution and z-values.
	7.9 Confidence Intervals	Find confidence intervals for normally distributed data.
	7.10 Hypothesis Testing	Perform hypothesis tests on normally distributed data.
Module 8 Area & Surface Area	8.1 Perimeter of Polygons	- Calculate the perimeter of various polygons. - Calculate missing side lengths of a shape when given the total perimeter. - Calculate the perimeter of a polygon using its area.
	8.2 Area of Polygons	- Calculate the area of a polygon in the coordinate plane. - Calculate the area of a regular polygon by decomposing it into triangles. - Calculate the area of a regular polygon using the perimeter and apothem. - Determine the viability of solutions.

Module	Lesson Title	Objectives
	8.3 Sectors and Segments	• Write an equation to determine the area of a sector. • Calculate the area of a sector. • Define a segment of a circle. • Calculate the area of a segment.
	8.4 Composite Figures	• Partition composite figures into their base shapes. • Estimate the area of a composite figure. • Calculate the area of a composite figure. • Calculate area using density.
	8.5 Maximizing Area	• Determine the optimal side lengths of a polygon whose perimeter is fixed to maximize its area. • Calculate the maximum area of a polygon when the perimeter is fixed. • Connect the perimeter, area, and number of sides a polygon has.
	8.6 Discovering Solids	• Define and classify solids. • Identify faces, vertices, and edges of solids. • Verify that Euler's geometry formula is true for a given solid. • Solve problems using Euler's theorem.
	8.7 Cubes & Spheres	• Name the mathematical properties of a cube and a sphere. • Derive the formula for the surface area of a cube and a sphere. • Calculate the surface area of a cube and a sphere.
	8.8 Pyramids & Cones	• Identify the properties of pyramids and cones. • Derive the formula for the surface area of a cone. • Determine the formula for the surface area of a pyramid. • Calculate the surface area of a pyramid and a cone.
	8.9 Cylinders & Prisms	• Name the properties of a prism. • Identify the types of prisms. • Derive the formula for the surface area of a right prism and a cylinder. • Calculate the surface area of a cylinder and a prism.

Module	Lesson Title	Objectives
	8.10 Measurement Relationships	- Describe the effect on the area when one or more dimensions of a figure are changed proportionally or non-proportionally. - Calculate the total surface area of a composite shape. - Calculate lateral surface area.
Module 9 Volume	9.1 Introduction to Volume	- Explain that the volume of most solids is the base area times the height. - Compare and contrast volume and surface area. - Explain Cavalieri's principle.
	9.2 Volume of a Cube	- Derive the formula for the volume of a cube. - Calculate the volume of a cube using different strategies. - Identify the cross section of a cube.
	9.3 Volume of Prisms	- Identify different types of prisms. - Determine the formula for the volume of a prism. - Calculate the volume of a prism. - Identify the cross section of a prism.
	9.4 Rectangular Prism Volume	- Distinguish between right rectangular prisms and oblique rectangular prisms. - Calculate the volume of a right rectangular prism and an oblique rectangular prism. - Calculate the volume of a composite solid consisting of rectangular prisms. - Analyze real-world scenarios by comparing the volume of rectangular prisms.
	9.5 Volume of Cylinders	- Derive the formula for the volume of a cylinder. - Identify the cross sections of a cylinder and how they are used. - Calculate the volume of a right cylinder and an oblique cylinder. - Explain how the volume of a right cylinder compares to the volume of an oblique cylinder.
	9.6 Volume of Spheres	- Derive the formula for the volume of a sphere. - Define and identify spheres, hemispheres, and great circles. - Calculate the volume of a sphere. - Identify the cross section of a sphere and the three-dimensional object created by rotating the cross section.

Module	Lesson Title	Objectives
	9.7 Volume of Cones	- Explain the formula for the volume of a cone. - Identify the cross section of a cone and the three-dimensional object created by rotating the cross section. - Calculate the volume of a cone and a conical frustum.
	9.8 Volume of Pyramids	- Explore the formula for the volume of a pyramid. - Identify the cross section of a pyramid and the three-dimensional object created by rotating the cross section. - Calculate the volume of a right pyramid and a truncated pyramid.
	9.9 Changing Dimensions	- Describe how proportional changes in dimension affect volume. - Describe how non-proportional changes in dimension affect volume. - Scale the dimensions of an object. - Calculate the volume of a scaled object.
	9.10 Comparisons	- Calculate the volume of a composite solid. - Compare the volumes of different shapes to make decisions. - Compare goods using volume per unit.
Module 10 Conic Sections	10.1 Midpoint Formula	Find the midpoint of a segment on the coordinate plane.
	10.2 Distance Formula	Find the distance between two points on the coordinate plane.
	10.3 Equations of Parabolas	- Write equations of parabolas in standard form. - Graph parabolas and identify parts of the parabola.
	10.4 Circles	- Graph circles. - Write equations of circles.

Module	Lesson Title	Objectives
	10.5 Equations of Ellipses	Write equations of ellipses.
	10.6 Graphing Ellipses	Graph ellipses.
	10.7 Hyperbolas	- Write equations of hyperbolas. - Graph hyperbolas.
	10.8 Conic Sections	- Write equations of conic sections in standard form. - Given their equations, identify conic sections.
	10.9 Linear & Nonlinear Equations	Solve systems of linear and nonlinear equations algebraically and graphically.
	10.10 Inequality Systems	Solve systems of linear and nonlinear inequalities graphically.
Module 11 Trigonometric Functions	11.1 Right Triangle Trigonometry	- Find values of trigonometric functions for acute angles. - Use trigonometric functions to find side lengths and angle measures of right triangles.
	11.2 Angles and Their Measures	- Draw and interpret angles in standard position. - Convert between degree and radian measures.
	11.3 Functions & Angles	- Find values of trigonometric functions for general angles. - Find values of trigonometric functions by using reference angles.
	11.4 Inverse Trig Functions	- Find values of the inverse of a trigonometric function. - Solve equations using the inverse of trigonometric functions.

Module	Lesson Title	Objectives
	11.5 Law of Sines	- Find the area of a triangle using two sides and an included angle. - Use the Law of Sines to solve triangles.
	11.6 Law of Cosines	- Use the law of cosines to solve triangles. - Choose methods to solve triangles.
	11.7 Circular Functions	Find values of trigonometric functions based on the unit circle.
	11.8 Periodic Functions	- Evaluate trigonometric functions using the properties of periodic functions. - Determine features of a trigonometric function graph such as period, amplitude, and midline.
	11.9 Graphing Trig Functions	- Graph sine, cosine, and tangent functions. - Find the amplitude and frequency of a trigonometric function from a graph and an equation.
	11.10 Translating Trig Graphs	- Graph vertical translations of trigonometric graphs. - Graph horizontal translations of trigonometric graphs. - Find phase shifts.
Module 12 Trigonometric Identities	12.1 Reciprocal Trig Functions	- Define cosecant, secant, and cotangent functions as reciprocals of sine, cosine, and tangent functions. - Evaluate reciprocal trigonometric functions. - Graph reciprocal trigonometric functions.
	12.2 Trigonometric Identities	Find trigonometric values using trigonometric identities.
	12.3 Simplifying Expressions	Simplify expressions using trigonometric identities.

Module	Lesson Title	Objectives
	12.4 Verifying Trig Identities	• Verify trigonometric identities by changing one side of an equation to match the form of the other side. • Verify trigonometric identities by changing both sides of an equation to the same form.
	12.5 Sum and Difference Identities	• Use sum and difference identities to find values of sine and cosine. • Use sum and difference identities to verify trigonometric identities.
	12.6 Using Double-Angle Identities	• Use double-angle identities to find values of sine and cosine.
	12.7 Using Half-Angle Identities	• Use half-angle identities to find values of sine and cosine.
	12.8 Solving Trig Equations	• Solve trigonometric equations. • Use the inverse trigonometric function to find the value of theta.
	12.9 Extraneous Solutions	• Solve trigonometric equations using trigonometric identities. • Identify extraneous solutions to trigonometric equations.
	12.10 Using Technology	• Graph trigonometric functions to solve real-word problems.