

Technical Mathematics Scope & Sequence

- **Course Description**

The Technical Math course is designed to deepen students' understanding of different branches of math by focusing on application skills that are used in current trades. This course is intended for students interested in pursuing a trade or two-year college program. The math concepts in this course are presented completely within the context of practical on-the-job applications, making math tangible and relevant. The practical math used in the trades includes mathematical concepts from algebra and geometry with applications relevant to these topics. Students will review applications of operations with integers, fractions, decimals, order of operations, exponents, multi-step equations, and plane geometry. Additionally, students will analyze real-world problems using statistical models as well as the application of triangle trigonometry, unit conversions, variation, and measurement of geometric figures. Special attention has been given to on-the-job math skills by using a wide variety of practical applications in the context of real world problems. This course will include students preparing for performance assessments that are often part of job applications, apprenticeships, the civil service exam, and other assessments related to specific trades and the workforce

Days May Vary	Unit	Outcome(s)	Essential/Guiding Questions
8-10	Unit 1: Arithmetic of Whole Numbers	<ul style="list-style-type: none"> ● Write whole number in words then translate words to numbers as used in the workplace ● Determine when it is advantageous to use mental math, estimation, or the actual 	<ul style="list-style-type: none"> ● What are whole numbers and why write them in expanded form? ● What is the process and purpose of rounding ? ● How do you perform operations on whole

		<p>operation.</p> <ul style="list-style-type: none"> ● Solve practical applications involving whole numbers as they apply to the real world. 	<p>numbers?</p> <ul style="list-style-type: none"> ● How do I know which computational method (mental math, estimation, paper and pencil, or calculator) to use? ● How do you solve problems using addition, subtraction, multiplication, or division in real world situations?
9-11	Unit 2: Working with Fractions	<ul style="list-style-type: none"> ● Perform all four operations using fractions and mixed numbers in real-world situations. ● Analyze the use of fractions in a variety of real-world situations. 	<ul style="list-style-type: none"> ● Why is it necessary to change the denominator to complete operations? ● When is it needed to use improper fractions? A mixed number?
6-8	Unit 3: Decimal Numbers	<ul style="list-style-type: none"> ● Determine when it is better to use decimals or fractions. ● Analyze how fractions and decimals are used in real-world situations. ● Explain the relationship between fractions and decimals. 	<ul style="list-style-type: none"> ● How are fractions and decimals related and which is the best to use in various situations? ● How do you determine the most precise solution when using fractions or decimals?
8-10	Unit 4: Ratio, Proportion and Percent	<ul style="list-style-type: none"> ● Analyze how ratios and proportions are used in the real world. ● Solve real-world problems 	<ul style="list-style-type: none"> ● What is the compression ratio? ● What is a direct and inverse proportion?

		<p>using ratios, proportions and/or percent.</p> <ul style="list-style-type: none"> ● Make mathematical connections between decimals and percent. 	<ul style="list-style-type: none"> ● How are proportions and percent used in real-world problem solving?
8-10	Unit 5: Measurement	<ul style="list-style-type: none"> ● Determine the precision, accuracy, and greatest possible error of measurement numbers. ● Convert units within the U.S. customary system, within the metric system, and between the U.S. customary and metric systems. ● Use common technical measuring instruments. ● Determine the best measuring instrument for a specific task. 	<ul style="list-style-type: none"> ● How will you determine how precise you need to be with your measurements? ● Why is it important to convert measurements in the same measurement system? ● Why is it important to understand the relationship between the metric measurement system and the customary system?
7-9	Unit 6: Pre-Algebra	<ul style="list-style-type: none"> ● Understand the meaning of signed numbers and their use in the real-world. ● Add, subtract, multiply and divide signed numbers in real-world situations. ● Describe how exponents and square roots are used in the real world. 	<ul style="list-style-type: none"> ● Why are negatives necessary? ● Why is order of operations important? ● What are real world applications of square roots?
12-14	Unit 7:	<ul style="list-style-type: none"> ● Evaluate formulas and literal 	<ul style="list-style-type: none"> ● How is Algebra used in the

	Algebra	<p>expressions.y.</p> <ul style="list-style-type: none"> ● Solve linear equations in one unknown and solve formulas. ● Translate English phrases and sentences into algebraic expressions and equations, and solve real-world application word problems. ● Convert between decimal notation and scientific notation. ● Apply scientific notation in real-world situations. 	<p>real world?</p> <ul style="list-style-type: none"> ● How do formulas simplify a task? ● What is the value of scientific notation?
7-9	Unit 8: Practical Plane Geometry	<ul style="list-style-type: none"> ● Measure and classify angles. ● Use simple geometric relationships involving intersecting lines and triangles. ● Identify polygons, including triangles, squares, rectangles, parallelograms, trapezoids, and hexagons. ● Use the Pythagorean theorem. ● Find the area and perimeter of geometric figures. ● Solve practical problems involving area and perimeter of plane figures. 	<ul style="list-style-type: none"> ● How are angle measurements used in the real world? ● How can finding the perimeter and/or area assist you in the real-world? ● How do you read a protractor and when might you need to in the real world?
7-9	Unit 9: Triangle Trigonometry	<ul style="list-style-type: none"> ● Analyze solid figures, including prisms, cubes, cones, cylinders, pyramids, spheres, and 	<p>How will the study of trigonometry assist you in the real world?</p>

		<p>frustums.</p> <ul style="list-style-type: none"> ● Find the surface area and volume of solid objects. ● Analyze how triangles are used in the real world. ● Solve practical problems involving solid figures. 	
6-8	Unit 10: Statistics	<ul style="list-style-type: none"> ● Create and analyze bar graphs, line graphs, and circle graphs. ● Calculate and analyze the measure of central tendency: mean, median, and mode. ● Calculate and analyze measures of dispersion: range and standard deviation. ● Calculate and analyze mean and standard deviation for data grouped in a frequency distribution. ● Use the concept of normal distribution to predict the spread of data values. 	<ul style="list-style-type: none"> ● Why is it important to represent the data in different forms? ● How can the same data presented show multiple outcomes