ESSENTIAL LEARNING OUTCOMES (ELOs)

ELOs stand for Essential Learning Objectives. Essential Learning Objectives (ELOs) are statements for each grade level and content that represent what we feel students at Cochrane-Fountain City should know and be able to do upon completion of that school year. Teachers and students work on the ELOs throughout the school year and assess and monitor students' progress continually.

ESSENTIAL LEARNING OUTCOMES ARE:

- Essential outcomes represent the essential understandings that a student must learn to reach high levels of learning.
- Essential outcomes identify non-negotiable learning which informs planning and instruction.
- Essential outcomes help identify which students did not master specific essential outcomes and need additional support.
- Essential outcomes support common assessment development.

ESSENTIAL LEARNING OUTCOMES ARE NOT:

- Essential outcomes do not represent all that is being taught.
- Essential outcomes do not omit parts of the curriculum.
- Essential outcomes are not for reporting purposes only.

Grade: 7th | Course: Math

Students will:

- Identify proportional relationships that can be used to solve real-world problems. In this chapter, students will determine whether the relationship between two quantities is proportional. Then they will use proportions to solve multi-step problems.
- Calculate basic operations with percentages and fractions and apply the knowledge to word problems.
- Calculate basic operations with integers and apply the knowledge to word problems.
- Distinguish between expressions, equations, and inequalities. They will be able to determine when and how to use substitution in solving problems.
- Use formulas to calculate perimeter, area, surface area, volume, and circumference.
- Calculate similar figures and ratios. Students will work on measurements with rulers.
- Calculate basic probability with and without replacement. They will determine the differences between basic theoretical and experimental probabilities.

Grade: 8th | Course: Math

Students will:

- Know that there are numbers that are not rational and approximate them by rational numbers. Students will be able to work with integer exponents.
- Understand the connections between proportional relationships, lines, and linear equations.3
- Investigate patterns of association of bivariate data.
- Understand the connections between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.
- Understand and apply the Pythagorean Theorem.
- Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
- Understand congruence and similarity using physical models, transparencies, or geometry software.
- Know that there are numbers that are not rational and approximate them by rational numbers.
- Work with integer exponents.

Grade: 9th – 10th | Course: Algebra I

Students will:

- Use, simplify and solve expressions, equations, and functions with variables and explore real number operations.
- Solve equations to connect and extend the big ideas introduced in Math 8 to solve equations and proportions.
- Use linear functions to connect and extend on the big ideas of graphing equations.
- Solve equations of linear functions that explore the interpretation and predictions of data using linear concepts.
- Solve inequalities that extend solving equations into solving inequalities.
- Solve systems of equations and systems of inequalities and understand the concepts associated with both equations and inequalities.
- Simplify and understand Exponents and exponential functions to expand on students' understanding and skills related to exponential expressions.
- Solve and simplify polynomials based on previous quadratic skills and prepare for factoring of quadratics.
- Solve quadratic equations by finding square roots, solve quadratic equations by the quadratic formula, and other methods.
- Using and evaluating square roots to apply with quadratic equations, Pythagorean theorem, distance, and midpoint formulas.

Grade: 10th – 11th | Course: Algebra II

Students will:

- Be introduced to properties and characteristics of conic sections by applying the distance and midpoint formulas, then learn how to graph and write equations for parabolas, circles, ellipses, and hyperbolas.
- Work with systems of equations, systems of inequalities, and matrices to solve systems graphically and algebraically, including systems with many solutions and systems with no solutions.
- Use the properties of equality to solve linear equations and to rewrite formulas and equations.
- Solve and graph linear inequalities and to solve absolute value equations and inequalities.
- Analyze functions using symmetry, end behaviors and key features of linear, quadratic, and piecewise functions.
- Simplify, transform, and analyze rational functions and solve rational equations.
- Factor and solve polynomial equations using intercepts and other methods.
- Add, subtract, multiply and divide polynomials.
- Graph, evaluate and use exponential growth and decay functions, logarithmic functions and solve exponential and logarithmic functions.
- Learn statistics using simulations and experiments while analyzing data with distributions.
- Explore sequences and series to define explicit rules that generate number sequences and define recursive rules for generating arithmetic and geometric sequences & series.

Grade: 10th – 11th | Course: Geometry

Students will:

- Recognize and apply the building blocks of geometry (postulates, definitions, theorems, vocabulary) in order to reason inductively and deductively.
- Understand congruence and similarity and apply the properties to 2-dimensional figures.
- Prove triangles congruent by theorems.
- Find arc lengths and areas of sectors of circles.
- Understand and apply theorems about circles.
- Apply properties and formulas (Pythagorean Theorem) for 2-dimensional and 3-dimensional figures to solve problems.
- Define trigonometric ratios, apply trigonometry to triangles, and extend their knowledge to trigonometric functions.
- Use properties of right triangles to find missing measurements.
- Perform transformations (by rotation, reflections, translations, and dilations).
- Apply algebraic concepts to coordinate geometric situations.
- Understand and apply conditional probability.

Grade: 11th – 12th | Course: Pre-Calculus

Students will:

- Use trigonometric functions to solve triangle sides and angle measurements.
- Use inverse functions.
- Graph trigonometric functions while identifying key components such as amplitude, phase shifts, and period changes.
- Convert degrees to radians, read and reproduce the unit circle and solve trigonometric radian problems.
- Manipulate matrices, perform basic vector operations, and identify gradient/divergence/curl of a vector field.
- Describe and identify exponential functions which model a relationship in which a constant change in the independent variable gives the same proportional change.
- Draw and sketch and solve problems of plane geometry of Parabola and all planes figures.
- Describe how a function behaves near a point, instead of at that point. This simple yet powerful idea is the basis of all of calculus.

Grade: 11th – 12th | Course: Applied Math

Students will:

- Learn about income (gross income, calculate hourly wages, salary wages, overtime, and commission).
- Learn about taxes such as state/federal/social security.
- Calculate taxes and percentages for APR.
- Learn about auto and health insurance by discussing and calculating premiums and deductibles.
- Discuss the costs associated with purchasing a vehicle.
- Be able to buy/sell/trade stock and see how to make a person's money grow.
- Decipher the differences between experimental and theoretical probability.
- Distinguish and use data.
- Use graphs (bar, circle, box & whisker).
- Learn to budget income while considering the many factors of life such as food, insurance, rent/mortgage, gas, etc.
- Determine the differences between checking and savings accounts.
- Determine how math helps us make real decisions based on evidence.
- Discuss logos, sales, surveys, and demographic data.
- Identify uses and applications for topography analysis.
- Calculate elevation and depth.
- Calculate perimeter, area, volume, and surface area.
- Solve real-world problems that pertain to agriculture, construction, and architecture.
- Develop software algorithms.