



## **Curriculum Document for Mathematics**

**Course Title: middle school**

**Grade: 8**

**Learner Objective #1: Students will use appropriate vocabulary and reasoning skills when solving and presenting problems.**

- Solve word problems using the 4-step problem-solving method (explore, plan, solve and examine).
- Use reasoning abilities to recognize patterns and relationships.
- Analyze nonroutine problems using strategies like: guessing, illustrating, simplifying, etc.
- Communicate problem solving with 6-trait writing.
- In cooperative groups explain mathematical concepts, procedures, and ideas to others who may not be familiar with them.

**Learner Objective #2: Students will effectively use numbers for measuring, estimating, and problem solving.**

- Perform operations (+, -, mult. and divide) including parentheses and powers on rational numbers (whole numbers, integers, decimals and fractions).
- Find and model equivalencies among fractions, decimals and percents.
- Use the strategies of estimation and calculating mentally for problems that use rational numbers.
- Apply number theory concepts like divisibility, primes and composites, GCF, LCM and remainders.
- Compare and order relationships among rational numbers.

**Learner Objective #3: Students will use geometric concepts and relationships to interpret, represent, and solve problems.**

- Classify 2-D shapes and identify their parts.

- Identify and contrast the properties (symmetry, congruency, parallel parts, etc.) of 2-D shapes.
- Plot points in the coordinate plane.
- Perform transformations (translation, reflection and rotation) of 2-D shapes in the coordinate plane.
- Draw or construct and then label models of 2-D and 3-D shapes from 2-D perspectives.

**Learner Objective #4: Students will use appropriate tools to measure accurately. Students will use measurements in problem-solving situations.**

- Use both metric and customary measurements to find length, mass and capacity.
- Use both metric and customary measurements to find estimations of indirect measurements.
- Convert units of measurement within the metric system and within the customary system.
- Relate metric measurements to customary measurements.
- Use ratios and proportions to determine measurements for scale/real drawings.
- Use trigonometry to find indirect measurements.
- Use geometric formulas to find perimeter, circumference, surface area, area, volume, etc.
- Use the Pythagorean theorem.
- Find the measurement of angles using parallel line relationships (alternate interior, corresponding, etc.).

**Learner Objective #5: Students will use data and statistics in problem-solving situations.**

- Gather and organize data using real world surveys and probability manipulatives (dice, blocks, cards, etc.).
- Organize and display data using technology (Excel).
- Analyze and interpret data using mean, median, mode, range and outliers.
- Use the results of data analysis to make predictions and draw conclusions.
- Find total outcomes for simple events using tree diagrams, fundamental principal of counting, combinations and permutations.
- Analysis graphs for missing information and biased presentation.

**Learner Objective #6: Students will use algebraic patterns and generalizations to define and solve problems.**

- Simplify and evaluate algebraic expressions using order of operations.
- Read, write and solve linear equations and inequalities.
- Solve equations and inequalities the contain whole numbers, integers and rational numbers (fractions and decimals).

- Solve equations dealing with ratios and proportions.
- Recognize and use properties of equations and inequalities (substitution, distributive, commutative, etc.).
- Describe a linear relationship's graph as positive or negative.