MATHEMATICS CURRICULUM PROJECT

GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.
Standard A: Measure and compare quantities using appropriate units, instruments and methods.
Standard B: Estimate measurements and determine acceptable levels of accuracy.

As a result of their schooling students will be able to…

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
1. Explore the use of rulers. 2. Explore units of time using calendars and clocks. 3. Recognize penny, nickel and dime. 4. Estimate and measure length of objects using non-standard, standard and metric tools.	1. Determine the attributes of an object that are measurable (e.g., length and weight are measurable; color and texture are not). 2. Compare and order objects according to measurable attributes. 3. Estimate nonstandard measurements of length, weight and capacity. 4. Measure objects using non-standard and standard units. 5. Explore and describe chronological events (e.g., calendars, timelines, seasons). 6. Explore telling time using an analog clock. 7. Identify units of money and the value of each (penny, nickel, dime, quarter). 8. Count like and unlike sets of coins.	1. Identify the type of measure (e.g., weight, height, volume, temperature) for each measurable attribute. 2. Estimate and measure objects using standard units. 3. Order events chronologically. 4. Tell time using an analog clock. 5. Estimate elapsed time and explore measuring elapsed time to the half hour. 6. Describe relationships within units of time, money, and length (e.g., 12 inches in a foot). 7. Count, compare and order sets of unlike coins. 8. Show equivalent amounts of money. 9. Estimate the amount of money needed to make purchases. 10. Explore and explain making change using manipulatives.	1. Measure and compare standard units and metric units. 2. Estimate and measure perimeter of simple polygons. 3. Estimate, measure and compare volume using cups, pints, quarts, gallons, liter and milliliter manipulatives. 4. Estimate, measure and compare mass/weight using pound, ounce, gram and kilogram scales. 5. Read, write and tell time to the minute using analog and digital clocks. 6. Determine elapsed time. 7. Compute time in days, months and years. 8. Identify all US coins and bills and identify their value; add, subtract and compare monetary values; make change. 9. Determine if there is too much or too little information given to solve a problem.	1. Measure to ¼ inch. 2. Convert U.S. customary measurements into larger or smaller units with the help of conversion charts. 3. Convert linear metric measurements into larger or smaller units with the help of a conversion chart. 4. Solve problems using elapsed time. 5. Develop and use mathematical language for volume, weight/mass, capacity, area and angle measures to make comparisons and estimates. 6. Develop and discuss strategies for estimating the perimeters, areas and volumes of regular and non-regular shapes.

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Standard B: Estimate measurements and determine acceptable levels of accuracy.

As a result of their schooling students will be able to…

Grade 5	Grade 6	Grade 7	Grade 8/Pre-Algebra/ Algebra
1. Convert U.S. customary and metric measurements into larger or smaller units. 2. Draw an angle of any given measure using a protractor or angle ruler. 3. Explain the meaning of a measurement answer in context and that all measurements are approximations. 4. Describe how precision is affected by choice of units. 5. Estimate the perimeter, area, and/or volume of regular and irregular shapes and objects. 6. Select appropriate tools to measure, draw, or construct figures. 7. Develop and use formulas to determine the area of squares, rectangles and right triangles. 8. Read and interpret a scale on a map or a scale drawing using the idea of a constant ratio (e.g., 1" represents 1 mile) and use it to answer questions about actual measurement.	1. Measure, with a greater degree of accuracy, any angle using a protractor or angle ruler. 2. Estimate distance, weight, temperature and elapsed time using reasonable units and with acceptable levels of accuracy. 3. Solve problems that involve converting within the customary and metric measurement systems.	1. Select and justify measurements of length, capacity, weight and mass, in the customary and metric systems and use a ruler, protractor, compass and balance scale as measurement tools. 2. Estimate accurately and determine acceptable limits when measuring angles, area and volume.	1. Solve problems involving perimeter/circumference and area of polygons, circles and composite figures using diagrams, models and grids or by measuring or using given formulas (may include sketching a figure from its description). 2. Compare and estimate (including perimeter/circumference), area, volume, weight/mass and angles (0° to 360°). 3. Solve problems involving the volume or surface area of a right rectangular prism, right circular cylinder, pyramid, cone, or composite shape using an appropriate formula or strategy. 4. Solve problems involving unit conversions <u>within the same measurement system</u> for length, weight/mass, capacity, square units and measures expressed as rates (e.g., converting feet/second to yards/minute as well as converting customary to metric). 5. Solve problems involving scale drawings, maps and indirect measurement (e.g., determining the height of a building by comparing its known shadow length to the known height and shadow of another object.

GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.
Standard C: Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.

As a result of their schooling students will be able to…

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
1. Introduce math tools to solve problems and interpret results.	1. Select appropriate nonstandard measurement units to measure length, weight and capacity (e.g., number of handfuls of cubes to fill a container).	1. Select an appropriate unit and tool for measurement. 2. Explore and describe perimeter and area of real objects. 3. Solve problems using money and time.	1. Draw a line segment to a given inch or centimeter. 2. Construct squares, triangles and rectangles using rulers and graph paper. 3. Use calculators to compute perimeter when side measurements are given. 4. Using rulers, find perimeters and area by measuring sides.	1. Select and apply appropriate standard units and tools to measure the size of angles. 2. Determine the volume of a cube or rectangular prism using concrete materials. 3. Create an accurate representation of a polygon with a given perimeter or area.

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Grade 5	Grade 6	Grade 7	Grade 8/Pre-Algebra/ Algebra
See Goal 7, Standard A (combined Standards A, B and C)	1. Select and justify an appropriate formula to find the area of triangles, parallelograms and trapezoids. 2. Select an appropriate formula or strategy to find the surface area and volume of rectangular and triangular prisms. 3. Develop and use formulas for determining the area of triangles, parallelograms and trapezoids. 4. Develop and use the formula for determining the volume of a rectangular and triangular prism. 5. Calculate the surface area of a cube, rectangular prism and triangular prism. 6. Develop and use formulas for determining the circumference and area of circles. 7. Solve problems involving scale drawings and maps.	1. Select and use appropriate units and tools to measure volume, surface area and mass/weight accurately for a given situation. 2. Select an appropriate formula to determine the circumference and the area of circles. 3. Select and explain an appropriate formula or strategy to find the surface area and volume of rectangular and triangular pyramids, cylinders and cones. 4. Solve simple problems involving rate, time and distance. 5. Solve problems involving mixed units of the same attribute, including time, money, length and area. 6. Explore and explain derived measurements (e.g., velocity and density). 7. Develop and discuss strategies to find the area of combined shapes.	See Goal 7, Standard A (combined Standards A, B and C)