

STATE GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Why This Goal Is Important: Measurement provides a way to answer questions about “how many,” “how much” and “how far.” It is an indispensable component of business, manufacturing, art, medicine and many other aspects of daily life. We describe the sizes, capacities and values of many things, from the large distances involved in space travel, to the very small quantities in computer design and microbiology, to the varying values of currencies in international monetary exchange. All people must be able to choose an appropriate level of accuracy for a measurement; to select what measuring instruments to use and to correctly determine the measures of objects, space and time. These activities require people to be able to use standard instruments including rulers, volume and capacity measures, timers and emerging measurement technologies found in the home and workplace.

A. Measure and compare quantities using appropriate units, instruments and methods.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
7.A.1a Measure length, volume and weight/mass using rulers, scales and other appropriate measuring instruments in the customary and metric systems.	7.A.2a Calculate, compare and convert length, perimeter, area, weight/mass and volume within the customary and metric systems.	7.A.3a Measure length, capacity, weight/mass and angles using sophisticated instruments (e.g., compass, protractor, trundle wheel).	7.A.4a Apply units and scales to describe and compare numerical data and physical objects.	7.A.5 Apply nonlinear scales (e.g., Richter, decibel, pH) to solve practical problems.
7.A.1b Measure units of time using appropriate instruments (e.g., calendars, clocks, watches—both analog and digital).	7.A.2b Solve addition, subtraction, multiplication and division problems using currency.	7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	7.A.4b Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density and monetary values.	
7.A.1c Identify and describe the relative values and relationships among coins and solve addition and subtraction problems using currency.				
7.A.1d Read temperatures to the nearest degree from Celsius and Fahrenheit thermometers.				

B. Estimate measurements and determine acceptable levels of accuracy.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
7.B.1a Given a problem, describe possible methods for estimating a given measure.	7.B.2a Determine and communicate possible methods for estimating a given measure, selecting proper units in both customary and metric systems.	7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.	7.B.4 Estimate and measure the magnitude and directions of physical quantities (e.g., velocity, force, slope) using rulers, protractors and other scientific instruments including timers, calculators and computers.	7.B.5 Estimate perimeter, area, volume, and capacity of irregular shapes, regions and solids and explain the reasoning supporting the estimate.
7.B.1b Compare estimated measures to actual measures taken with appropriate measuring instruments.	7.B.2b Estimate conversions between measures within the customary and metric systems.			

C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
7.C.1 Determine perimeter and area using concrete materials (e.g., geoboards, square tiles, grids, measurement instruments).	7.C.2a Describe relationships in a simple scale drawing.	7.C.3a Construct a simple scale drawing for a given situation.	7.C.4a Make indirect measurements, including heights and distances, using proportions (e.g., finding the height of a tower by its shadow).	7.C.5a Use dimensional analysis to determine units and check answers in applied measurement problems.
	7.C.2b Construct or draw figures with given perimeters and areas.	7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	7.C.4b Interpret scale drawings and models using maps and blueprints.	7.C.5b Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved).
			7.C.4c Convert within and between measurement systems and monetary systems using technology where appropriate.	