Grade: 3 **Subject:** Science	**Unit of Study: Measurement**
Big Idea/Rationale	Measurement, the process of quantifying observations, is one of the cornerstones of science. Measurement compares nature—the unknown—to a standard unit—the known. Through such comparison, the organization of the world becomes more comprehensive.
Enduring Understanding (Mastery Objective)	• Understand the necessity for standard units of measurement. • Develop an understanding and intuitive feel for the metric system. • Measure length and distance in meters and centimeters with a meter tape. • Measure mass in grams with a balance and mass pieces. • Measure liquid volume and capacity of containers in liters and milliliters with 50-ml syringes and graduated cylinders. • Measure temperature of liquids and air in degrees Celsius with a thermometer. • Acquire the vocabulary associated with metric measurement. • Exercise language and math skills in the context of metric measurement. • Apply appropriate measuring skills in everyday situations. • Develop and refine the manipulative skills required for making and using measuring tools. • Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, and organizing.
Essential Questions (Instructional Objective)	• What is a measurement standard? • What are the measurement standards for linear measurement? • What is estimating? Why do scientists use estimation? • What is mass? • What are the measurement standards used when measuring mass? • What is volume? What is capacity? • What are the measurement standards used when finding volume or capacity? • What is temperature? • What is the measurement standard used when measuring temperature?
Content (Subject Matter)	• A measurement standard is a unit agreed upon and used by a large number of people. (Investigation 1, Part 1) • A meter (m) is the standard metric unit for measuring length or distance. (Investigation 1, Part 1) • A centimeter (cm) is 1/100 of a meter; it takes 100cm to make a meter. (Investigation 1, Part 1) • A kilometer (km) is 1000 meters. (Investigation 1, Part 1) • An estimate is a guess based on some reference or prior knowledge. (Investigation 1, Part 2)

	• Apply content introduced in previous parts. (Investigation 1, Part 3) • The gram (g) is the standard unit of measure used to quantify mass in the metric system (equal to 1cc, or 1ml of water). (Investigation 2, Part 1) • Mass is how much of something there is. (Investigation 2, Part 1) • A kilogram is 1000 grams or the same as to the mass of one liter of water. (Investigation 3, Part 1) • A sponge can hold 8 to 10 times its own mass. (Investigation 3, Part 1) • Volume is the three-dimensional space occupied by something. (Investigation 3, Part 1) • The liter (L) is the standard for measuring fluid volume in the metric system. (Investigation 3, Part 1) • One liter is equal to 1000 milliliters; 1 milliliter is equal to 1/1000 liter (Investigation 3, Part 1) • Capacity is the volume of liquid (such as water) a container can hold when full. (Investigation 3, Part 2) • The label on a soda can refers to the volume of soda in the can, not the capacity of the can. (Investigation 3, Part 3) • Degree Celsius (°C) is the unit used when scientists measure temperature. (Investigation 4, Part 1) • Temperature is affected by the addition or subtraction of heat. (Investigation 4, Part 2)
Skills/ Benchmarks (CCSS Standards)	• 5.1.A: Science Practices, Understanding Scientific Explanations • 5.1.4.A.2: Use the outcomes of investigations to build and refine questions, models, and explanations. • 5.1.4.A.3: Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments. • 5.1.B: Science Practices, Generate Scientific Evidence Through Active Investigation • 5.1.4.B.1: Design and follow simple plans using systematic observations to explore questions and predictions • 5.1.4.B.2: Measure gather, evaluate, and share evidence using tools and technologies • 5.1.C: Science Practices, Reflect on Scientific Knowledge • 5.1.4.C.1: Monitor and reflect one's own knowledge regarding how ideas change over time. • 5.1.4.C.2 Revise predictions or explanations on the basis of learning new information. • 5.1.4.C.3 Present evidence to interpret and/or predict cause-and-effect outcomes of investigations. • 5.1.D: Science Practices, Participate Productively in Science: • 5.1.4.D.1: Actively participate in discussions about student data, questions, and understandings. • 5.1.4.D.2: Work collaboratively to pose, refine, and evaluate questions,

	investigations, models, and theories. • 5.1.8.D.3: Demonstrate how to safely use tools, instruments and supplies • 5.2.A: Physical Science, Properties of Matter • 5.2.4.A.3: Determine weight and volume of common objects using appropriate tools. • 5.2.C: Physical Science, Forms of Energy • 5.2.4.C.1: Compare various forms of energy as observed in everyday life and describe their applications. • 5.2.4.C.2: Compare the flow of heat through metals and nonmetals by taking and analyzing measurements. • 5.2.4.C.3: Draw and label diagrams showing several ways that energy can be transferred from one place to another.
Materials and Resources	FOSS Meaurement Kit: Straws (different lengths), Meter Tapes, Balances, Gram Pieces, Cups, Washers, Wooden Squares, Plastic Chips, Paper Clips (small and large), Mass set (composed of small objects around the classroom), Bag of Gravel, Apple/Orange, Sponges, Containers, Vials (small and large), Beakers, Basins, Pitchers, Spoon, Syringes, Graduated Cylinders, Soda-Cans, Thermometers, Ice Water, Hot Water, Sticky Notes, Paper Towels, Ice Cubes, Student Sheets (for each experiment), Technology Cart, BrainPop, DiscoveryEducation
Notes	