Grade: 5 **Subject:** Science	**Unit 1: Mixtures and Solutions**
Big Idea/Rationale:	• The Mixtures and Solutions Unit studies the structure of matter and the changes or transformations that take place in it. Learning about the makeup of substances gives us knowledge about how things go together and how they can be taken apart. Learning about changes in substances is important for several reasons: changes can be controlled to produce new materials; changes can be used to give off energy to run machines. The Mixtures and Solutions model has four investigations that introduce students to these fundamental ideas in chemistry.
Enduring Understanding (Mastery Objective):	• Learn that a mixture combines two or more materials that retain their own properties • Understand that a solution forms when a material dissolves in liquid (solvent) and cannot be retrieved with a filter • Learn that evaporation can separate a liquid from a solid in a solution • Understand the solid material separated by evaporation from a solution forms distinctive patterns • Understand solubility is the property that substances have of dissolving in solvents • Leans that a solution is saturated when as much solid material as possible has dissolved in the liquid • Understand that concentration expresses a relationship between the amount of dissolved material and the volume of solvent • Learn when a change results from mixing two or more materials, the change is a chemical reaction resulting in new materials. • Scientific inquiry involves asking scientifically-oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory and communicating and justifying the explanation.
Essential Questions (Instructional Objectives):	• What constitutes evidence? • What makes a question scientific? • When do you know you have enough evidence? • Why is it necessary to justify and communicate an explanation? • How do properties of materials determine their use? • How can the properties of the components of a mixture be used to separate the mixture?
Content (Subject Matter & Lesson Objectives):	• A mixture combines 2 or more materials that retain their own properties (Investigation 1, Part 1) • A solution forms when a material dissolves in a liquid and cannot be retrieved with a filter (Investigation 1, Part 1) • Evaporation can separate a liquid from a solid in a solution (Investigation 1, Part 2)

	• The mass of a mixture to its parts is the same (Investigation 1, Part 2) • Evaporation of salt water results in salt crystals in distinctive patterns (Investigation 1, Part 3) • A mixture combine two or more materials that retain their own properties (Investigation 1, Part 4) • A dry mixture (grave, powder, and salt) gets separated using techniques of filtering and evaporation (Investigation 1, Part 4) • A solution is saturated when as much solid material as possible has dissolved in the liquid (Investigation 2, Part 1) • Simple solutions are composed of liquid solvent and solid solute (Investigation 2, Part 1) • A solution is saturated when as much solid material as possible has dissolved in the liquid (Investigation 2, Part 2) • Solubility is the property that substances have of dissolving in solvents (Investigation 2, Part 2) • Solubility is different for different materials and can change with temperature and solvents (Investigation 2, Part 2) • Solubility is different for different materials and can change with temperature and different solvents (Investigation 2, Part 3) • Citric Acid and Epsom salt crystals have specific shapes and patterns (Investigation 2, Part 4) • Concentration expresses a relationship between the amount of dissolved material and the volume of solvent (Investigation 3, Part 1) • The more solvent dissolved in a solution, the more concentrated the solution (Investigation 3, Part 1) • A concentrated solution can be made dilute by adding solvent to it (Investigation 3, Part 1) • The more material dissolve din a liquid, the more concentrated the solution (Investigation 3, Part 2) • When equal volumes of two solutions made from the same ingredients are compared, the heavier one is the more concentrated solution (Investigation 3, Part 2) • Determine the relative concentrations of mystery salt solutions (Investigation 3, Part 3) • A chemical reaction is change results from mixing 2 or more materials. A reaction results in new material (Investigation 4, Part 1) • Formation of gas occurs in some reactions (Investigation 4, Part 1) • Formation of precipitate occurs in some chemical reactions (Investigation 4, Part 1) • Formation of precipitate occurs in some chemical reactions (Investigation 4, Part 2) • Some products of a reaction are soluble and can be observed only after evaporating the solution (Investigation 4, Part 2) • Chemical reactions occur in the closed system helps observe the gas more critically. Zip bag provides closed system for the reactions

	(Investigation 4, Part 3)
Skills/Benchmarks: (Standards)	**5.1.A: Science Practices, Understanding Scientific Explanations** • 5.1.8.A.1: Demonstrate understanding and use interrelationships among central scientific concepts to revise explanations and to consider alternative explanations • 5.1.8.A.2: Use mathematical, physical and computational tools to build conceptual-based models and to pose theories • 5.1.8.A.3: Use scientific principles and models to frame and synthesize scientific arguments and pose theories **5.1.B: Science Practices, Generate Scientific Evidence Through Active Investigations** • 5.1.8.B.1: Design investigations and use scientific instrumentation to collect, analyze and evaluate evidence as part of building and revising models and explanations • 5.1.8.B.2: Gather, evaluate and represent evidence using scientific tools, technologies and computational strategies • 5.1.8.B.3: Use qualitative and quantitative evidence to develop evidence-based arguments **5.1.C: Science Practices, Reflect on Scientific Knowledge** • 5.1.8.C.1: Monitor one's own thinking as understanding of scientific concepts is refined • 5.1.8.C.2 Revise predictions or explanations on the basis of discovering new evidence, learning new information or using models • 5.1.8.C.3 Generate new and productive questions to evaluate and refine core explanations **5.1.C: Science Practices, Participate Productively in Science:** • 5.1.8.D.1: Engage in multiple forms of discussion in order to process, makes sense of and learn from others' ideas, observations and experiences. • 5.1.8.D.2: Engage in productive scientific discussion practices during conversations with peers, both face to face and virtually in the context of scientific investigations and model building • 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. • 5.2.6.A.1: Determine the volume of common objects using water displacement methods • 5.2.6.A.3: Determine the identity of an unknown substance using data about intrinsic properties **5.2.B: Physical Science, Changes in Matter** • 5.2.6.B.1: Compare the properties of reactants with the properties of the products when two or more substances are combined and react chemically

Materials:	• FOSS Mixtures and Solutions Kit: Plastic Bottles with Caps, ½ Liter Containers, Evaporating Dishes, Screens, 5ml Metric Spoons, Craft Sticks, Foss Plastic Trays, Vials, Teacher Guide, Prep Video, Foss Science Stories: Mixtures and Solutions, Plastic Cups, Permanent Marker, Gravel, Foss Funnel Stands, Baking Soda, Calcium Chloride, Citric Acid, Diatomaceous Earth, Epsom Salt, Filter Papers, Sticky Notes, Kosher Salt, 1 Liter Zip Bags, Balance Scales, 1 Gram Cubes, Safety Goggles, Paper Towels, Pitchers, Water, Food Coloring, White Vinegar, 3oz Paper Cups, Soft Drink Mix, Stirring Spoon, Technology Cart, BrainPop, DiscoveryEducation
Notes:	