Revised: 5/21/24
Board Approved:

7th Grade Science Yearly Standards

Units	Priority Standards
Unit 1 **Chemical Reactions and Matter**	**6-8.PS1.A.1** **DEVELOP** models to **DESCRIBE** the atomic composition of simple molecules and extended structures [Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. E*xamples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms]* **6-8.PS1.A.2** **ANALYZE** and **INTERPRET** data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred *[Clarification Statement: Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride]* **6-8.PS1.A.3** **GATHER, ANALYZE** and **PRESENT** information to **DESCRIBE** that synthetic materials come from natural resources and how they impact society *[Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels]* **6-8.PS1.B.1** **DEVELOP** and **USE** a model to **DESCRIBE** how the total number of atoms remains the same during a chemical reaction and thus mass is conserved *[Clarification Statement: Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms that represent atoms]*
Unit 2 **Chemical Reactions and Energy**	**6-8. PS1.B2** **CONSTRUCT, TEST, and MODIFY** a device that either releases or absorbs thermal energy by chemical processes. {Clarification Statement: Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride

	6-8.ETS1.B1 **EVALUATE** competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem **6-8.ETS1.B.2** **ANALYZE** data from several tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success **6-8.ETS1.B.3** **DEVELOP** a model to **GENERATE** data for iterative testing and modification of a proposed object, tool or process such that an optimal design can be achieved
Unit 3 **Metabolic Reactions**	**6-8. LS1.A.3** **DEVELOP** an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissues, organs, and organ systems **6-8.LS1.B.2** **CONSTRUCT** a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. {Clarification Statement: Examples of local environmental conditions could include the availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting the growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.}(Assessment Boundary: Assessment DOES NOT include genetic mechanisms, gene regulation or biochemical processes.) **6-8.PS1.A.1** **DEVELOP** models to **DESCRIBE** the atomic composition of simple molecules and extended structures. {Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms.{ **6-8. PS1.A.2** **ANALYZE and INTERPRET** data on properties of substances before and after the substances interact to determine if a chemical reaction has occurred. {Calrification Statement: Examples of reactions could include burning sugar or steel wool, fat reaction with sodium hydroxide, and mixing zinc with hydrogen chloride.}
Unit 4	**6-8.LS1.A.1**

Matter Cycling and Photosynthesis	**PROVIDE** evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life. {Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and nonliving things, and understanding that living things may be made of one cell or many and varied cells.} **6-8.LS1.A.2** **DEVELOP and USE** a model to **DESCRIBE** the function of a cell as a whole and the ways parts of the cells contribute to that function. {Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall} **6-8.LS1.A.3** **DEVELOP** an argument based on evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, and organ systems **6-8. LS1.C** **CONSTRUCT** a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms
Unit 5 **Ecosystem Dynamics**	**6-8. LS2.A.1** **ANALYZE and INTERPRET** data to **PROVIDE** evidence for the effects of resource availability on individual organisms and populations of organisms in an ecosystem. {Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources} **6-8.LS2.C.1** **CONSTRUCT** and argument supported by empirical evidence that explains how changes to physical or biological components of an ecosystem affect populations {Clarification Statement: Emphasis is on recognizing patterns in data and making inferences about changes in population, defining the boundaries of the system, and on evaluating empirical evidence supporting arguments about changes to ecosystems} **6-8.LS2.A.2** **CONSTRUCT** an explanation that predicts the patterns of interactions among and between the biotic and abiotic factors in a given ecosystem. {Clarification Statement: Relationships may include competition, predation and symbiosis.} **6-8.LS2.C2**

	EVALUATE the benefits and limitations of differing design solutions for maintaining an ecosystem. {Clarification Statement: Examples of design solutions could include water, land and species protection, and the prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.} **6-8.ESS3.C.2** **APPLY** scientific principles to design a method for monitoring and minimizing a human impact of the environment. {Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land.) **6-8.ETS1.A** **DEFINE** the criteria and constraints of a design problems with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
Unit 6 Earth's Resources and Human Impact	**6-8. ESS3.A** **CONSTRUCT** a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity. (Clarification Statement: Emphasis is on how these resources are limited and typically non renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps) metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones) and soil (locations of active weathering and or deposition of rock) **6-8.ESS3.C.1** **ANALYZE** data to **DEFINE** the relationship for how increase in human population and per-capita consumption of natural resources impact Earth's systems. (Clarification Statement: Examples of data include grade appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to appearance, composition, and structure of Earth's systems as well as the rates at which they change.) **6-8.ESS3.C.2** **APPLY** scientific principles to **DESIGN** a method for monitoring and minimizing a human impact on the environment. (Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce the impact. Examples of human impacts can include water usage (such as the withdrawal of water from

	streams and aquifers or the construction of dams and levees) land usage (such as urban development, agriculture, or the removal of wetlands) and pollution (such as of the air, water or land) **6-8.ESS3.D** **ANALYZE** evidence of the factors that have caused the change in global temperatures over the past century. (Clarification Statement: Examples of factors include human activities (such as fossil fuel combustion, cement production, and agricultural activity) and natural processes (such as changes in incoming solar radiation or volcanic activity) Examples of evidence can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gasses such as carbon dioxide and methane, and the rates of human activities) **6-8.ETS1.B.1** **EVALUATE** competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.