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JC Schools 7th Grade Yearly Science Standards

Overarching Standards
6-8.ETS1.A.1 Define the criteria and constraints of a design problem 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 **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 **6-8.ETS1.B.2** Analyze data from 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

Units	Priority Standards	Supporting Standards
Unit 1: **Cells and Cells Processes** 67 days **Unit End Date:** Dec.1	**6-8.LS1.A.1** 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 non-living things, and understanding that living things may be made of one cell or many and varied cells]*	**6-8.LS1.A.3** Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems. **6-8.LS1.A.4** Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body

Unit Assessment Window: Nov. 19-Dec.8	**6-8.LS1.A.2** Develop and use a model to describe the function of a cell as a whole and 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]*	motion/activity and coordination, and protecting the body. **6-8.LS1.C.1** 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 2: **Natural Selection** 49 days **Unit End Date:** Feb. 24 **Unit Assessment Window:** Feb. 16-Mar. 3	**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 availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting 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]* **6-8.LS4.B.1** Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. *[Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations]*	**6-8.LS1.B.1** Construct an explanation for how characteristic animal behaviors as well as specialized plant structures affect the probability of successful reproduction of animals and plants respectively. *[Clarification Statement: Examples of animal behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds; and, creating conditions for seed germination and growth. Examples of plant structures that affect the probability of plant reproduction could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury]* **6-8.LS1.C.1** 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. **6-8.LS4.A.1** Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the

		history of the Earth. *[Clarification Statement: Examples of evidence include sets of fossils that indicate an environment, anatomical structures that indicate the function of an organism in the environment, and fossilized tracks that indicate behavior of organisms]* **6-8.LS4.B.2** Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. *[Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, and farming practices)]* **6-8.LS4.C.1** Interpret graphical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.
Unit 3: **Ecology** 48 days **Unit End Date:** May 10 **Unit Assessment Window:** May 3-17	**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.B.1** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. *[Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, including food chains and food webs]*	**6-8.LS1.C.1** 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 **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 an 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 populations, defining the boundaries of the system, and on evaluating empirical evidence supporting arguments about changes to ecosystems]* **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 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.LS2.C.2** Evaluate 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.1** Analyze data to define the relationship for how increases 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 the appearance, composition, and structure of Earth's systems as well as the rates at which they change]* **6-8.ESS3.D.1** 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 gases such as carbon dioxide and methane, and the rates of human activities]*