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| **Unit 1a** | **Introduction to Science (Observation, Garden, Classroom Routines, Notebook Cover, Crosscutting Concepts, etc.)** | **Time: 3 weeks** |
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| **Unit 1b** | **Life Science: Molecules to Organisms-Structures and Processes** | **Time: 8 weeks** |
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| Standard  [LS1-1](https://www.nextgenscience.org/dci-arrangement/1-ls1-molecules-organisms-structures-and-processes) **Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. [**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.]  **CC: Patterns, Structure and Function** | | |
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| Standard  [**LS1-3**](http://www.nextgenscience.org/pe/ms-ls1-3-molecules-organisms-structures-and-processes) **Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.** [Emphasis is on the understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.]  **CC: Systems and System Models** | | |
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| Standard  [LS1-8](http://www.nextgenscience.org/pe/ms-ls1-8-molecules-organisms-structures-and-processes) **Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.**  **CC: Cause and Effect** | | |
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| **Unit 2** | **Physical Science: Energy** | **Time: Quarter 2** |
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| Standard  [PS3-5](http://www.nextgenscience.org/pe/ms-ps3-5-energy) **Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.** [Examples of empirical evidence used in arguments could include an inventory or other representation of the energy before and after the transfer in the form of temperature changes or motion of object.]  **CC: Energy and Matter** | | |
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| Standard  [PS3-4](http://www.nextgenscience.org/pe/ms-ps3-4-energy) **Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.** [Examples of experiments could include comparing final water temperatures after different masses of ice melted in the same volume of water with the same initial temperature, the temperature change of samples of different materials with the same mass as they cool or heat in the environment, or the same material with different masses when a specific amount of energy is added.]  **CC: Scale, Proportion, and Quantity** | | |
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| Standard  [PS3-3](http://www.nextgenscience.org/pe/ms-ps3-3-energy) **Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.**\* [Examples of devices could include an insulated box, a solar cooker, and a Styrofoam cup.]  **CC: Energy and Matter** | | |
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| **Unit 3** | **Earth’s Systems and Human Activity** | **Time: Quarter 3** |
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| Standard  [ESS2-4](http://www.nextgenscience.org/pe/ms-ess2-4-earths-systems) **Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.** [Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.]  **CC: Energy and Matter** | | |
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| Standard  [ESS2-5](http://www.nextgenscience.org/pe/ms-ess2-5-earths-systems) **Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.** [Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).]  **CC: Cause and Effect** | | |
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| Standard  [ESS2-6](http://www.nextgenscience.org/pe/ms-ess2-6-earths-systems) **Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.** [Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.]  **CC: Systems and System Models** | | |
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| Standard  [ESS3-5](http://www.nextgenscience.org/pe/ms-ess3-5-earth-and-human-activity) **Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.** [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. Emphasis is on the major role that human activities play in causing the rise in global temperatures.]  **CC: Stability and Change** | | |
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| Standard  [ESS3-3](http://www.nextgenscience.org/pe/ms-ess3-3-earth-and-human-activity) **Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.**\* [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).]  **CC: Cause and Effect** | | |
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| **Unit 4** | **Life Science: Heredity**  Sexual v. Asexual Reproduction and Genetics | **Time: Quarter 4** |
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| Standard  [LS3-2](http://www.nextgenscience.org/pe/ms-ls3-2-heredity-inheritance-and-variation-traits) **Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.** [Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.]  **CC: Cause and Effect** | | |
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| Standard  [LS1-4](http://www.nextgenscience.org/pe/ms-ls1-4-molecules-organisms-structures-and-processes) **Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.** [Examples of 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 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.]  **CC: Cause and Effect** | | |
| **Learning Outcomes** | **Activities** | **Assessments** |
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| Standard  [LS1-5](http://www.nextgenscience.org/pe/ms-ls1-5-molecules-organisms-structures-and-processes) **Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.** [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.]  **CC: Cause and Effect** | | |
| **Learning Outcomes** | **Activities** | **Assessments** |
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