

Idealized Sequence by Topics (6 - 8) with Discovery Education Pieces

Life Science and Physical Sciences (6th Grade)

Topics	Standards	Discovery Education Resources	Other Resources / Commentary
<p>Cells (in Structure, Function, and Information Processing)</p>	<p>Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. MS-LS1-1</p> <p>Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. MS-LS1-2</p> <p>Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. MS-LS1-3</p>	<p>Grade 6 > Unit 1 > Concept 1.2: The Cell as a System</p> <ul style="list-style-type: none"> • (Explore) Activity 6, Brief History of the Cell [Video]: This activity has a video on the Brief History of a cell. It can be beneficial, but I don't think it's as strong an opening as other ideas might be. • (Explore) Activity 8, Hands-On Investigation: Cell Theory Evidence [Hands-On Activity]: If you have dry active yeast and a microscope, I think this activity is great. You crush the yeast with a mortar and pestle, suspend it in water, and then observe all these cells under a microscope. It lets students see that yeast is just made of identical yeast cells and lets you have a discussion around the Cell Theory. • (Explore) Activity 9, Why is it alive? Living or not living? [Formative items]: I think that this activity makes for a great class discussion. What does it mean to be alive or not alive? It opens up the case of what is a cell and what is an atom. • (Explore) Activity 11, Cell Structures [Literacy]: I like this activity only because it provides diagrams. I think that if you can do Activity 10 with a microscope, that could be a strong way to open up the observational difference between an animal and plant cells. 	

		<p>Otherwise, you might have luck finding a video that shows the cell differences first.</p> <ul style="list-style-type: none"> ● (Explore) Activity 12, The Parts of Cells [Video] and Comparing Plant and Animal Cells [Literacy]: I see myself doing these as station activities while I work with students on potentially Activity 14 or even an extension of Activity 14 which is what I'll go into below. They do a great job of overviewing information and you can definitely make a Kahoot out of the information based on those pages because they're so comprehensive ● (Explore) Activity 14, Cell City and Cancer Cell City [Formative Items]: I see myself making Activity 14 the evaluation of the concept except having students create their own cities or modeling their neighborhood using the ideas of Cell City. ● (Other Parts: Engage, Explain and Elaborate with STEM): I personally see myself using the idea of cancer as a way to close the unit and discuss implications with the information. I don't like it as a storyline, but I do like it as an elaborate. The explain activity has students explain colon cancer and I think that that blends nicely into discussing Cancer Researching as a career. Depending on the context of your students, you can also make it much more relevant to their lives if there's greater onsets of lung cancer, breast cancer, etc. 	
<p>Senses and Nervous System (in Structure, Function, and Information</p>	<p>Gather and synthesize information that sensory receptors respond to stimuli by sending</p>	<p>Grade 6 > Unit 1 > Concept 1.1 Body Systems</p> <ul style="list-style-type: none"> ● (Engage) Activity 1, 2 and 3 [Visual Literacy, Video, and Literacy]: These seem like a great way to show the body systems interacting. They explore what happens to the body when under a 	

Processing)	<p>messages to the brain for immediate behavior or storage as memories. MS-LS1-8</p>	<p>thrilling situation like a roller coaster. Teachers can develop their own prompts around how a roller coaster might be different for someone older or younger, when you eat too much or eat too little.</p> <ul style="list-style-type: none"> ● (Explore) Activity 8, The Brain and Your Nervous System [Interactive]: This interactive simulation is a great way for showing what parts of the brain are responsible for what. The book does not show enough information for students to understand the parts of the brain too well, but an introduction that has students consider most basic functions towards the nape of the neck and higher cognitive functions to the front might be beneficial. <ul style="list-style-type: none"> ○ I feel the same way about the other simulations in this Concept, so Activity 12 on Endocrine System, Activity 18 on Digestive System, and Activity 23 on Muscular System ○ 	
Photosynthesis (in Matter and Energy in Organisms and Ecosystems)	<p>Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. MS-LS1-6</p>		
Chemical Reactions for Energy (in Matter and Energy in	<p>Develop a model to describe how food is rearranged through chemical reactions forming</p>		

Organisms and Ecosystems)	<p>new molecules that support growth and/or release energy as this matter moves through an organism.</p> <p>MS-LS1-7</p>		
<p>Ecosystems and Energy (in Matter and Energy in Organisms and Ecosystems + Interdependent Relationships in Ecosystems)</p>	<p>Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>MS-LS2-1</p> <p>Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.</p> <p>MS-LS2-3</p> <p>Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.</p> <p>MS-LS2-4</p>		

	<p>Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. MS-LS2-2</p> <p>Evaluate competing design solutions for maintaining biodiversity and ecosystem services. MS-LS2-5</p>		
<p>Evidence of Evolution (in Natural Selection and Adaptations)</p>	<p>Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. MS-LS4-1</p> <p>Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil</p>		

	<p>organisms to infer evolutionary relationships. MS-LS4-2</p> <p>Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. MS-LS4-3</p>		
<p>Natural Selection (in Natural Selection and Adaptations and Growth, Development and Reproduction of Organisms)</p>	<p>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. MS-LS4-4</p> <p>Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of</p>		

	<p>specific traits in populations over time. MS-LS4-6</p> <p>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. MS-LS1-4</p> <p>Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. MS-LS1-5</p>		
<p>Asexual and Sexual Reproduction (in Growth, Development and Reproduction of Organisms)</p>	<p>Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to</p>		

	<p>the structure and function of the organism. MS-LS3-1</p> <p>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. MS-LS3-2</p> <p>Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. MS-LS4-5</p>		
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Physical Science and Earth and Space Science (7th Grade)

Topics	Standards	Discovery Education Resources
<p>Matter (in Structure and Properties of Matter)</p>	<p>Develop models to describe the atomic composition of simple molecules and extended structures. MS-PS1-1</p>	<p>Grade 7, Unit 1, Anchor Phenomenon: The anchor phenomenon with matter is strong. How matter in prosthetics has changed.</p>

	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. MS-PS1-3	
Phase Changes (in Structure and Properties of Matter)	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. MS-PS1-4	*Energy with particles is Unit 1 of Grade 7 and Energy in Ecosystems (Water Cycle) is Unit 2 of Grade 6
Chemical Reactions (in Chemical Reactions)	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. MS-PS1-2 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. MS-PS1-5 Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. MS-PS1-6	
Forces (in Forces and Interactions)	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. MS-PS2-1 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. MS-PS2-2	
Forces at a Distance / Non-Contact	Ask questions about data to determine the factors that affect the strength of	

<p>Forces (in Forces and Interactions)</p>	<p>electric and magnetic forces. MS-PS2-3</p> <p>Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. MS-PS2-4</p> <p>Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. MS-PS2-5</p>	
<p>Energy, Potential and Kinetic (in Energy)</p>	<p>Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. MS-PS3-1</p> <p>Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. MS-PS3-2</p> <p>Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. MS-PS3-3</p> <p>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. MS-PS3-4</p>	

	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. MS-PS3-5	
Waves and Wave Characteristics (in Waves and Electromagnetic Radiation)	<p>Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. MS-PS4-1</p> <p>Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. MS-PS4-2</p> <p>Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. MS-PS4-3</p>	

Earth and Space Science and Life Science (8th Grade)

Topics	Standards	Discovery Education Resources
Gravity on the Scale of Space (in Space Systems and Earth's Systems)	<p>Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. MS-ESS1-1</p> <p>Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. MS-ESS1-2</p>	

	<p>Analyze and interpret data to determine scale properties of objects in the solar system. MS-ESS1-3</p> <p>Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. MS-ESS2-4</p>	
<p>Earth's History (in History of Earth)</p>	<p>Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. MS-ESS1-4</p> <p>Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. MS-ESS2-2</p> <p>Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. MS-ESS2-3</p>	
<p>Systems on Earth and Energy (in Earth's Systems and Weather and Climate)</p>	<p>Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. MS-ESS2-1</p> <p>Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. MS-ESS2-4</p> <p>Construct a scientific explanation based on evidence for how the</p>	

	<p>uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. MS-ESS3-1</p> <p>Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. MS-ESS2-5</p> <p>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. MS-ESS2-6</p> <p>Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. MS-ESS3-5</p>	
<p>Human Impacts (in Human Impacts)</p>	<p>Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. MS-ESS3-2</p> <p>Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. MS-ESS3-3</p> <p>Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. MS-ESS3-4</p>	