

7th Grade Science (By Quarter) Scope and Sequence

Revised August 2018

1 st Nine Weeks				
Time*	Cluster	Standards	Learning Targets	Lesson Topics/Resources
2 weeks	Atoms, Molecules, and Mixtures	PS1.1 PS1.2 PS1.3	<p>I can develop and use models to explain the structure of atoms.</p> <p>I can explain how the charge and relative positions of subatomic particles give atoms their identity and characteristic properties</p> <p>I can develop an explanation for how atoms, elements, elemental molecules, and compound molecules are all unique parts of matter.</p> <p>I can analyze data in order to classify matter as either a pure substance, heterogeneous mixture, or homogeneous mixture.</p> <p>I can experiment to understand how to separate pure substances, heterogeneous mixtures, and homogeneous mixtures into component parts.</p> <p>I can make an argument for how all samples of matter are made from different combinations of atoms.</p>	<p>Chapter 1: Introduction to Matter</p> <p>Chapter 3: Atoms and Bonding</p>
2 weeks	States of Matter	PS1.6	<p>I can develop and use models to explain the structure, movement, and energy level of particles as solids, liquids, and gases.</p> <p>I can create and use heating curves to explain how a change in temperature can cause a change in state.</p> <p>I can develop and use models to explain particle structure, movement, and energy level during state changes.</p> <p>I can analyze data on temperature and pressure to determine the likely effect on state.</p>	Chapter 2: Solids, Liquids, and Gases
2 weeks	Physical and Chemical Properties	PS1.5	<p>I can plan and conduct experiments to determine the physical and chemical properties of different samples of matter.</p> <p>I can identify unknown samples of matter by analyzing data related to physical and chemical properties.</p>	<p>Chapter 1: Introduction to Matter</p> <p>Chapter 3: Atoms and Bonding</p>

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			<p>I can use the periodic table to identify patterns in the properties of elements.</p> <p>I can use the periodic table to determine properties of specific elements.</p>	
2 weeks	Law of Conservation of Mass	PS1.4	<p>I can develop and use models to show the rearrangement of atoms during a chemical reaction.</p> <p>I can analyze data in order to identify the reactants and products in a chemical reaction.</p> <p>I can plan and conduct experiments related to the Law of Conservation of Mass.</p> <p>I can use a chemical equation to represent a chemical reaction.</p> <p>I can use coefficients and subscripts to identify the number of molecules and atoms represented in a chemical equation.</p> <p>I can evaluate a chemical equation to determine if it adheres to the Law of Conservation of Mass.</p>	Chapter 4: Chemical Reactions

2nd Nine Weeks				
Time	Cluster	Standards	Learning Targets	Lesson Topics/Resources
4 Weeks	Cells	<p>LS1.1</p> <p>7.LS1.3</p> <p>7.LS1.2</p>	<p>I can develop models that explain the structure and function of major cell parts as they contribute to the life activities of the cell and organism.</p> <p>I can construct a model identifying how organelles work together for the survival of the cell and the larger organism.</p> <p>I can investigate the structures and compare cells from several organisms using a microscope.</p> <p>I can investigate the similarities and differences between prokaryotic and eukaryotic cells.</p> <p>I can use a microscope to analyze the differences between microscopic images of cells and scientific diagrams.</p> <p>I can investigate and defend the need for homeostasis in cells.</p> <p>I can illustrate a representation of the cell membrane's role in the active and passive transport of biological molecules.</p> <p>I can investigate the structure of the cell membrane, including transport proteins and their respective functions for the movement of biological molecules into and out of the cell.</p> <p>I can construct and communicate an argument providing evidence and reason for the surface area to volume ration of cells.</p> <p>I can investigate and predict how the cell membrane will maintain homeostasis in highly concentrated solution and less concentrated solutions.</p> <p>I can compare and contrast osmosis and diffusion.</p>	Chapter 5: Introduction to Cells

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		LS2.1	<p>I can develop and use models to explain how matter and energy cycle through the biotic and abiotic parts of an ecosystem.</p> <p>I can explain the connection between cycling of matter and energy with chemical changes, such as photosynthesis and cellular respiration.</p> <p>I can develop a model for how photosynthesis, cellular respiration, plants, and animals contribute to the global carbon cycle.</p> <p>I can investigate and explain how specific structures and processes are used by plants and animals to obtain nutrients from their environment.</p>	

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3 rd Nine Weeks				
Time	Cluster	Standards	Learning Targets	Lesson Topics/Resources
2 weeks	Reproduction	<p>LS1.6</p> <p>LS1.7</p>	<p>I can predict the ability for asexually or sexually reproducing species to survive and thrive under changing environmental conditions.</p> <p>I can identify adaptations in animals and plants that increase the chance of reproductive success.</p> <p>I can develop an argument for how a specific adaptation will increase the chances of an animal or plant reproducing.</p> <p>I can classify organisms according to whether they reproduce sexually or asexually.</p> <p>I can develop a logical argument with evidence detailing the advantages and disadvantages of sexual and asexual reproduction.</p>	<p>Chapter 7: Genetics-The Science of Heredity</p> <p>Chapter 8: DNA-The Code of Life</p>
2 weeks	Mitosis and Meiosis	<p>LS1.8</p> <p>LS3.2</p>	<p>I can model and explain the structural hierarchy of DNA, genes, chromatin, and chromosomes, along with their roles in determining inherited traits.</p> <p>I can justify and argument that mitosis is a process that supports growth, replacement, and repair within an organism.</p> <p>I can research and develop a model of the cell cycle which occurs in sequential stages to maintain the chromosome number of a species.</p> <p>I can research and explain how mitosis develops two identical daughter cells with the same number of chromosomes.</p> <p>I can differentiate between mitosis and meiosis.</p> <p>I can construct an explanation detailing why the process of meiosis is needed to maintain the number of chromosomes after the combination of gametes.</p>	<p>Chapter 6: Cell Processes and Energy</p>

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			I can evaluate and justify the relationship between meiosis and genetic variation.	
2 weeks	Heredity	LS3.3	I can identify and explain the difference between dominant and recessive traits, genotype and phenotype, and homogeneous and heterogeneous alleles through the evaluation of a monohybrid cross. I can predict the probability of a genotype and/or phenotype passing from one generation to another through the development of a Punnett Square. I can represent genotype and phenotype probability as a ratio. I can develop a model of a phenotypically accurate picture of an organism, based on a self-created Punnett Square.	Chapter 7: Genetics- The Science of Heredity Chapter 8: DNA- The Code of Life
		LS3.1	I can hypothesize how a genetic mutation can create harmful, beneficial, and neutral effects to the structure and function of an organism.	
1 week	Biomaterials	ETS2.1	I can research global medical concerns and design a possible solution while considering criteria, constraints, and relevant scientific principles.	STEM Part 1
1 week	Earth's Atmosphere and Climate	ESS3.1	I can analyze data and create graphs that represent the composition of Earth's atmosphere. I can develop an argument for why Earth's atmosphere is classified as a mixture. I can research and communicate specific chemical changes that impact the composition of Earth's atmosphere.	Chapter 13: The Atmosphere Chapter 14: Climate Change
		ESS3.2	I can analyze data to determine how human activities affect the condition of Earth's atmosphere and climate.	

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			I can develop questions that look at the implications of changes to the atmosphere's composition.	

*All suggested time frames are approximations and allow for one extra week per quarter for schedule flexibility. Revise proposed windows as needed to best benefit your students.