2021-2022 Vertical Alignment Matrix
Science – Grade 5 - Integrated Physics & Chemistry (IPC)

	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	Nature of Science				
Strand: Scientific Investigation and Reasoning	(PS) **SCI.5.1A** Demonstrate safe practices and the use of safety equipment as outlined in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate.	(PS) **SCI.6.1A** Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.	(PS) **SCI.7.1A** Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.	(PS) **SCI.8.1A** Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.	(PS) **IPC.1A** Demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles or chemical splash goggles, as appropriate, and fire extinguishers.
					(PS) **IPC.1B** Know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Safety Data Sheets (SDS).
	(PS) **SCI.5.1B** Make informed choices in the conservation, disposal, and recycling of materials.	(PS) **SCI.6.1B** Practice appropriate use and conservation of resources including disposal, reuse, or recycling of materials.	(PS) **SCI.7.1B** Practice appropriate use and conservation of resources including disposal, reuse, or recycling of materials.	(PS) **SCI.8.1B** Practice appropriate use and conservation of resources including disposal, reuse, or recycling of materials.	(PS) **IPC.1C** Demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.
					(PS) **IPC.2A** Know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section.
					(b)(2) Nature of science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." The vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.

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	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	(PS) **SCI.5.2A** Describe, plan, and implement simple experimental investigations testing one variable.	(PS) **SCI.6.2A** Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.	(PS) **SCI.7.2A** Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.	(PS) **SCI.8.2A** Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.	

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	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	Nature of Science				
Strand: Scientific Investigation and Reasoning	(PS) **SCI.5.2B** Ask well defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.	(PS) **SCI.6.2B** Design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology.	(PS) **SCI.7.2B** Design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology.	(PS) **SCI.8.2B** Design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology.	(PS) **IPC.2B** Plan and implement investigate procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology.
	(PS) **SCI.5.2C** Collect and record information using detailed observations and accurate measuring.	(PS) **SCI.6.2C** Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	(PS) **SCI.7.2C** Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	(PS) **SCI.8.2C** Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	(PS) **IPC.2C** Collect data and make measurements with accuracy and precision.
	(PS) **SCI.5.2D** Analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence.	(PS) **SCI.6.2D** Construct tables, using repeated trials and means to organize data and identify patterns.	(PS) **SCI.7.2D** Construct tables, using repeated trials and means to organize data and identify patterns.	(PS) **SCI.8.2D** Construct tables, using repeated trials and means to organize data and identify patterns.	
	(PS) **SCI.5.2E** Demonstrate that repeated investigations may increase the reliability of results.	(PS) **SCI.6.2E** Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	(PS) **SCI.7.2E** Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	(PS) **SCI.8.2E** Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	(PS) **IPC.2D** Organize, analyze, evaluate, make inferences, and predict trends from data.
	(PS) **SCI.5.2F** Communicate valid conclusions in both written and verbal forms.				(PS) **IPC.2E** Communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports, and technology-based reports.
	(PS) **SCI.5.2G** Construct appropriate simple graphs, tables, maps, and charts using technology including computers to organize, examine, and evaluate information.				

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	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	(PS) **SCI.5.3A** Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning and experimental and observational testing.	(PS) **SCI.6.3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.	(PS) **SCI.7.3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.	(PS) **SCI.8.3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.	(PS) **IPC.3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.

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	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	Nature of Science				
Strand: Scientific Investigation and Reasoning					(PS) **IPC.3B** Communicate and apply scientific information extracted from various sources such as current events, published journal articles and marketing materials.
					(PS) **IPC.3C** Draw inferences based on data related to promotional materials for products and services.
	(PS) **SCI.5.3B** Draw or develop a model that represents how something that cannot be seen such as the Sun, Earth, and Moon system and formation of sedimentary rock works or looks.	(PS) **SCI.6.3B** Use models to represent aspects of the natural world such as a model of Earth's layers.	(PS) **SCI.7.3B** Use models to represent aspects of the natural world such as human body systems, and plant and animal cells.	(PS) **SCI.8.3B** Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.	
		(PS) **SCI.6.3C** Identify advantages and limitations of models such as size, scale, properties, and materials.	(PS) **SCI.7.3C** Identify advantages and limitations of models such as size, scale, properties, and materials.	(PS) **SCI.8.3C** Identify advantages and limitations of models such as size, scale, properties, and materials.	
	(PS) **SCI.5.3C** Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.	(PS) **SCI.6.3D** Relate the impact of research on scientific thought and society including the history of science and contributions of scientists as related to the content.	(PS) **SCI.7.3D** Relate the impact of research on scientific thought and society including the history of science and contributions of scientists as related to the content.	(PS) **SCI.8.3D** Relate the impact of research on scientific thought and society including the history of science and contributions of scientists as related to the content.	(PS) **IPC.3D** Evaluate the impact of research on scientific thought, society, and the environment.
					(PS) **IPC.3E** Describe connections between physics and chemistry and future careers.
					(PS) **IPC.3F** Research and describe the history of physics, chemistry and contributions of scientists.

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	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	Nature of Science				
Strand: Scientific Investigation and Reasoning	(PS) **SCI.5.4A** Collect and analyze information using tools including calculators, microscopes cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, timing devices, magnets, collecting nets, notebooks and materials to support observations of habitats or organisms such as terrariums and aquariums.	(PS) **SCI.6.4A** Use appropriate tools, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, balances, microscopes, thermometers, calculators, computers, timing devices, and other necessary equipment to collect, record, and analyze information.	(PS) **SCI.7.4A** Use appropriate tools, including life science models, hand lenses, stereoscopes, microscopes, beakers, Petri dishes, microscope slides, graduated cylinders, test tubes, meter sticks, metric rulers, metric tape measures, timing devices, hot plates, balances, thermometers, calculators, water test kits, computers, temperature and pH probes, collecting nets, insect traps, globes, digital cameras and journals/notebooks and other necessary equipment to collect, record, and analyze information.	(PS) **SCI.8.4A** Use appropriate tools, including journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectroscopes, timing devices, and other necessary equipment as needed to collect, record, and analyze information.	
		(PS) **SCI.6.4B** Use preventative safety equipment including chemical splash goggles, aprons, and gloves and be prepared to use emergency safety equipment including an eye/face wash, a fire blanket, and a fire extinguisher.	(PS) **SCI.7.4B** Use preventative safety equipment including chemical splash goggles, aprons, and gloves and be prepared to use emergency safety equipment including an eye/face wash, a fire blanket, and a fire extinguisher.	(PS) **SCI.8.4B** Use preventative safety equipment including chemical splash goggles, aprons, and gloves and be prepared to use emergency safety equipment including an eye/face wash, a fire blanket, and a fire extinguisher.	
	Physical Science Content				
Strand: Matter and Energy		**SCI.6.5A** Know that an element is a pure substance represented by a chemical symbol and that a compound is a pure substance represented by a chemical formula.			
		SCI.6.5B Recognize that a limited number of the many known elements comprise the largest portion of solid Earth, living matter, oceans, and the atmosphere.			

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				Ⓡ **SCI.8.5A** Describe the structure of atoms including the masses, electrical charges and locations of protons and neutrons in the nucleus and electrons in the electron cloud.	

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	Physical Science Content				
Strand: Matter and Energy				Ⓡ **SCI.8.5B** Identify that protons determine an element's identity, and valence electrons determine the chemical properties including reactivity.	**IPC.6B** Relate chemical properties of substances to the arrangement of their atoms.
		Ⓢ **SCI.6.6A** Compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity or malleability.		Ⓡ **SCI.8.5C** Interpret the arrangement of the Periodic Table including groups and periods, to explain how properties are used to classify elements.	**IPC.6D** Relate the placement of an element on the Periodic Table to its physical and chemical behavior, including bonding and classification.
				Ⓡ **SCI.8.5D** Recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts.	
	Ⓡ **SCI.5.5A** Classify matter based on measurable, testable, and observable physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.	Ⓢ **SCI.6.6B** Calculate density to identify an unknown substance.			**IPC.6C** Analyze physical and chemical properties of elements and compounds such as, color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity.
					IPC.6A Examine differences in physical properties of solids, liquids and gases as explained by the arrangement and motion of atoms, or molecules.
					IPC.6E Relate the structure of water to its function as a solvent.
					IPC.6F Investigate the properties of water solutions and factors affecting solid solubility, including nature of solute, temperature, and concentration.

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	Physical Science Content				
Strand: Matter and Energy		**SCI.6.6C** Test the physical properties of minerals including hardness, color, luster, and streak.			**IPC.7A** **Investigate** changes of state as it relates to the arrangement of particles of matter and energy transfer.
	Ⓢ **SCI5.5C** Identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water.	**SCI.6.5C** Identify the formation of a new substance by using the evidence of a possible chemical change such as production of a gas, change in temperature, production of a precipitate, or color change.	Ⓢ **SCI.7.6A** Distinguish between physical and chemical changes.	Ⓡ **SCI.8.5E** Investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass.	**IPC.7B** Recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons.
	Ⓢ **SCI5.5B** Demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand and sand and water.				**IPC.7C** **Demonstrate** that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products.
					IPC.7F Research and describe the environmental and economic impact of the end-products of chemical reactions such as those that may result in acid rain, degradation of water and air quality, and ozone depletion.
					IPC.5D Investigate the law of conservation of energy.

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	Physical Science Content				
Strand: Matter and Energy					**IPC.7D** Classify energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks as exothermic or endothermic reactions.
		SCI.6.7A Research and discuss the advantages and disadvantages of using coal, oil, natural gas, nuclear power, biomass, wind, hydropower, geothermal, and solar resources.			**IPC.5I** Critique the advantages and disadvantages of various energy sources and their impact on society and the environment.
					IPC.5H Analyze energy transformations of renewable and nonrenewable resources.
					IPC.7E Describe types of nuclear reactions such as fission and fusion and their roles in applications such as medicine and energy production.
			Ⓢ **SCI.7.5B** Diagram the flow of energy through living systems including food chains, food webs and energy pyramids.		

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	Physical Science Content				
Strand: Force, Motion and Energy	Ⓡ **SCI.5.6A** Explore the uses of energy including mechanical, light, thermal, electrical, and sound energy.	Ⓢ **SCI.6.8A** Compare and contrast potential and kinetic energy.			**IPC.5A** Recognize and demonstrate that objects and substances in motion have kinetic energy such as vibration of atoms, water flowing down a stream moving pebbles, and bowling balls knocking down pins.
					IPC.5B Recognize and demonstrate common forms of potential energy including gravitational, elastic, and chemical, such as a ball on an inclined plane, springs and batteries.
	Ⓡ **SCI.5.6B** Demonstrate that the flow of electricity in closed circuits can produce light, heat, or sound.				**IPC.5F** Evaluate the transfer of electrical energy in series and parallel circuits, and conductive materials.
					IPC.5C Demonstrate that moving electric charges produce magnetic forces and moving magnets produce electric forces.
	Ⓡ **SCI.5.6C** Demonstrate that light travels in a straight line until it strikes an object and is reflected or travels from one medium to another and is refracted.				
	Ⓢ **SCI.5.6D** Design a simple experimental investigation that tests the effect of force on an object.	**SCI.6.8B** Identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces.	**SCI.7.7B** Demonstrate and illustrate forces that affect motion in organisms, such as emergence of seedlings, turgor pressure, geotropism, and circulation of blood.	Ⓡ **SCI.8.6A** Demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion.	**IPC.4A** Describe and calculate an object's motion in terms of position, displacement, speed and acceleration.
		Ⓢ **SCI.6.8C** Calculate average speed using distance and time measurements.		Ⓢ **SCI.8.6B** Differentiate between speed, velocity and acceleration.	**IPC.4B** Measure and graph distance and speed as a function of time.

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	Physical Science Content				
Strand: Force, Motion and Energy		Ⓢ **SCI.6.8D** Measure and graph changes in motion.			
				Ⓡ **SCI.8.6C** Investigate and describe applications of Newton's three laws of motion, such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.	**IPC.4C** Investigate how an object's motion changes only when a net force is applied, including activities and equipment such as toy cars, vehicle restraints, sports activities and classroom objects.
		SCI.6.8E Investigate how inclined planes can be used to change the amount of force to move an object.			**IPC.4D** Describe and calculate the relationship between force, mass and acceleration using equipment such as dynamic carts, moving toys, vehicles and falling objects.
					IPC.4E Explain the concept of conservation of momentum using action and reaction forces.
					IPC.4F Describe the gravitational attraction between objects of different masses at different distances.
					IPC.4G Examine electrical force as a universal force between any two charged objects.
		SCI.6.9A Investigate methods of thermal energy transfer including conduction, convection, and radiation.			**IPC.5E** Investigate and demonstrate the movement of thermal energy through solids, liquids, and gases by convection, conduction and radiation, such as in weather, living and mechanical systems.

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	Physical Science Content				
Strand: Force, Motion and Energy		**SCI.6.9B** Verify through investigations that thermal energy moves in a predictable pattern from warmer to cooler until all the substances attain the same temperature such as an ice cube melting.			
Strand: Force, Motion and Energy		Ⓢ **SCI.6.9C** Demonstrate energy transformations such as the energy in a flashlight battery changes from chemical energy to electrical energy to light energy.			**IPC.5G** Explore the characteristics and behaviors of energy transferred by waves including acoustic, seismic, light and waves on water, as they reflect, refract, diffract, interfere with one another, and are absorbed by materials.
Strand: Force, Motion and Energy			**SCI.7.7A** Illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy.		
	Earth Science Content				
Strand: Earth and Space		**SCI.6.10A** Build a model to illustrate the compositional and mechanical layers of Earth including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere.			
Strand: Earth and Space		**SCI.6.10C** Identify the major tectonic plates including Eurasian, African, Indo-Australian, Pacific, North American, and South American.		Ⓢ **SCI.8.9A** Describe the historical development of evidence that supports plate tectonic theory.	
Strand: Earth and Space	Ⓡ **SCI.5.7A** Explore the processes that led to the formation of sedimentary rocks and fossil fuels.	**SCI.6.10B** Classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation.			

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	Earth Science Content				
Strand: Earth and Space		**SCI.6.10D** Describe how plate tectonics causes major geological events, such as ocean basin formation, earthquakes, volcanic eruptions, and mountain building.	**SCI.7.8A** Predict and describe how catastrophic events, such as floods, hurricanes, or tornadoes impact ecosystems.	Ⓡ **SCI.8.9B** Relate plate tectonics to the formation of crustal features.	
	Ⓡ **SCI.5.7B** Recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, or ice.		**SCI.7.8B** Analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas.	Ⓡ **SCI.8.9C** Interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.	
	Ⓢ **SCI.5.8A** Differentiate between weather and climate.			Ⓢ **SCI.8.10A** Recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds.	
	Ⓢ **SCI.5.8B** Explain how the Sun and the ocean interact in the water cycle.			Ⓢ **SCI.8.10B** Identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts.	
				Ⓢ **SCI.8.10C** Identify the role of the oceans in the formation of weather systems, such as hurricanes.	
			Ⓢ **SCI.7.8C** Model the effects of human activity on ground water and surface water in a watershed.	Ⓢ **SCI.8.11C** Recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.	

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	Earth Science Content				
Strand: Earth and Space		**SCI.6.11A** Describe the physical properties, locations, and movements of the Sun, planets, moons, meteors, asteroids, and comets.	**SCI.7.9A** Analyze the characteristics of objects in our solar system that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere.		
		Ⓢ **SCI.6.11B** Understand that gravity is the force that governs the motion of our solar system.			
	Ⓡ **SCI.5.8C** Demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky.			Ⓡ **SCI.8.7A** Model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the sun, causing changes in seasons.	
	Ⓢ **SCI.5.8D** Identify and compare the physical characteristics of the Sun, Earth, and Moon.			Ⓡ **SCI.8.7B** Demonstrate and predict the sequence of events in the lunar cycle.	
				Ⓢ **SCI.8.7C** Relate the positions of the Moon and Sun to their effect on ocean tides.	
				Ⓡ **SCI.8.8A** Describe components of the universe including stars, nebulae and galaxies, and use models such as the Hertzsprung-Russell diagram for classification.	
				Ⓢ **SCI.8.8B** Recognize that the Sun is a medium-sized star located in a spiral arm of the Milky Way galaxy and that the Sun is many thousands of times closer to Earth than any other star.	

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				Ⓢ **SCI.8.8C** Identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to measure distances and sizes in the gain information about components in the universe.	

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Strand: Earth and Space	**Earth Science Content**				
				SCI.8.8D Research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.	
		SCI.6.11C Describe the history and future of space exploration including the types of equipment and transportation needed for space travel.	**SCI.7.9B** Identify the accommodations, considering the characteristics of our solar system that enabled manned space exploration.		
Strand: Organisms and Environments	**Life Science Content**				
		SCI.6.12A Understand that all organisms are composed of one or more cells.			
		SCI.6.12B Recognize the presence of a nucleus is a key factor used to determine whether a cell is prokaryotic or eukaryotic.			
			Ⓢ **SCI.7.12D** Differentiate between structure and function in plant and animal cell organelles including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole.		
			SCI.7.12E Compare the functions of cell organelles to the functions of an organ system.		
			Ⓢ **SCI.7.12F** Recognize the components of cell theory.		

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	Life Science Content				
Strand: Organisms and Environments		**SCI.6.12C** Recognize the broadest taxonomic classification of living organisms is divided into currently recognized domains.			
		Ⓢ **SCI.6.12D** Identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized kingdoms.			
			SCI.7.12C Recognize levels of organization in plants and animals including cells, tissues, organs, organ systems, and organisms.		
			Ⓢ **SCI.7.12B** Identify the main functions of the systems of the human organism including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine system.		
			SCI.7.12A Investigate and explain how internal structures of organisms have adaptations that allow specific functions, such as gills in fish, hollow bones in birds, or xylem in plants.		
			SCI.7.13A Investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight.		

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			SCI.7.13B Describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.		

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	Life Science Content				
Strand: Organisms and Environments	Ⓡ **SCI.5.9A** Observe the way organisms live and survive in their ecosystem by interacting with the living and non-living components.	**SCI.6.12E** Describe biotic and abiotic parts of an ecosystem in which organisms interact.	**SCI.7.10A** Observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms.	Ⓡ **SCI.8.11A** Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition.	
	Ⓡ **SCI.5.9B** Describe the flow of energy within a food web, including the roles of the Sun, producers, consumers, and decomposers.		**SCI.7.5A** Recognize that radiant energy from the sun is transformed into chemical energy through the process of photosynthesis.		
		SCI.6.12F Diagram the levels of organization within an ecosystem including organism, population, community, and ecosystem.	Ⓢ **SCI.7.10B** Describe how biodiversity contributes to the sustainability of an ecosystem.		
	Ⓢ **SCI.5.9C** Predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways.		Ⓢ **SCI.7.10C** Observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds.	Ⓡ **SCI.8.11B** Explore how short- and long-term environmental changes affect organisms and traits in subsequent populations.	
	Ⓢ **SCI.5.9D** Identify fossils as evidence of past living organisms and the nature of the environments at the time using models.				
	Ⓡ **SCI.5.10A** Compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals.		Ⓢ **SCI.7.11A** Examine organisms or their structures, such as insects or leaves, and use dichotomous keys for identification.		

2021-2022 Vertical Alignment Matrix
Science – Grade 5 - Integrated Physics & Chemistry (IPC)

	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	Ⓡ **SCI.5.10B** Differentiate between inherited traits of plants and animals such as spines on a cactus or shape of beak, and learned behaviors such as an animal learning tricks or a child riding a bicycle.		**SCI.7.11B** Explain variation within a population or species by comparing external features, behaviors, or physiology of organisms that enhance their survival such as migration, hibernation, or storage of food in a bulb.		

2021-2022 Vertical Alignment Matrix
Science – Grade 5 - Integrated Physics & Chemistry (IPC)

	Grade 5	Grade 6	Grade 7	Grade 8	Integrated Physics and Chemistry (IPC)
	Life Science Content				
Strand: Organisms and Environments			Ⓢ **SCI.7.11C** Identify some changes in genetic traits that can have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals and hybrid plants.		
			SCI.7.14A Define heredity as the passage of genetic instructions from one generation to the next generation.		
			Ⓢ **SCI.7.14B** Compare the results of uniform or diverse offspring from asexual or sexual reproduction.		
			Ⓢ **SCI.7.14C** Recognize that inherited traits of individuals are governed in the genetic material found in the genes within the chromosomes in the nucleus.		