

## Science – Grade 5 - IPC Vertical Alignment Matrix

### Strand 1: Nature of Science

Strand	Grade 5	Grade 6	Grade 7	Grade 8	IPC	
Nature of Science	Safety	<b>SCI.5.1A</b> Demonstrate and evaluate safe practices during field and laboratory investigations using appropriate equipment such as safety goggles, gloves, and laboratory aprons.	<b>SCI.6.1A</b> Demonstrate safe practices during classroom and field investigations as outlined in the Texas Science Safety Standards	<b>SCI.7.1A</b> Demonstrate safe practices during classroom and field investigations as outlined in the Texas Science Safety Standards.	<b>SCI.8.1A</b> Demonstrate safe practices during classroom and field investigations as outlined in the Texas Science Safety Standards.	<b>IPC.1A</b> Demonstrate safe practices during classroom and field investigations as outlined in the Texas Science Safety Standards. Student modeling and simulations may be considered laboratory investigations.
		<b>SCI.5.1B</b> Make wise choices in the use and conservation of resources and the disposal or recycling of materials.	<b>SCI.6.1B</b> Make wise choices in the use and conservation of resources such as the disposal of hazardous products and the recycling of materials.	<b>SCI.7.1B</b> Make wise choices in the use and conservation of resources such as the disposal of hazardous products and recycling of materials.	<b>SCI.8.1B</b> Make informed choices in the use and conservation of resources such as the disposal of hazardous products and recycling of materials.	<b>IPC.1B</b> Make wise choices in the use and conservation of resources and the disposal or recycling of materials.
	Inquiry	<b>SCI.5.2A</b> Plan, implement and evaluate descriptive and simple experimental investigations that include a well-defined question, a testable hypothesis, one variable and the use of equipment and technology.	<b>SCI.6.2A</b> Plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, identifying variables, and selecting and using grade-appropriate, content-embedded equipment and technology.	<b>SCI.7.2A</b> Plan and implement investigative procedures, including asking questions, formulating testable hypotheses, conducting multiple trials, and selecting and using grade appropriate, content-embedded equipment and technology.	<b>SCI.8.2A</b> Plan and implement investigative procedures, including asking questions, formulating testable hypotheses, conducting multiple trials, and selecting and using grade appropriate, content-embedded equipment and technology.	<b>IPC.2A</b> Plan and implement investigative procedures, including asking questions, formulating testable hypotheses, identifying variables, conducting multiple trials, and selecting course-specific, content-embedded equipment and technology.
		<b>SCI.5.2B</b> Collect and analyze information by observing, measuring, and using numerical operations such as addition, subtraction, and scaling.	<b>SCI.6.2B</b> Collect information by observing and measuring using the International System of Units (SI).	<b>SCI.7.2B</b> Collect data by observing and measuring using the International Systems of Units (SI).	<b>SCI.8.2B</b> Collect information by observing and measuring using the metric systems (SI).	<b>IPC.2B</b> Collect data and make measurements with accuracy and precision.
		<b>SCI.5.2C</b> Analyze and interpret information to construct reasonable explanations from direct and indirect evidence.	<b>SCI.6.2C</b> Analyze and interpret information to construct reasonable explanations from direct and indirect evidence.	<b>SCI.7.2C</b> Analyze, organize, and interpret information to construct reasonable explanations from direct and indirect evidence.	<b>SCI.8.2C</b> Organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence.	<b>IPC.2C</b> Organize, analyze, evaluate, make inferences, and predict trends from data including graphing data to observe and identify relationships between variables.
		<b>SCI.5.2D</b> Communicate and evaluate valid conclusions using oral presentations or written statements that include pictorial and numerical representations.	<b>SCI.6.2D</b> Communicate valid conclusions from supporting data.	<b>SCI.7.2D</b> Communicate valid conclusions from supporting data.	<b>SCI.8.2D</b> Communicate valid conclusions from supporting data.	<b>IPC.2D</b> Communicate valid conclusions.
		<b>SCI.5.2E</b> Construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information.	<b>SCI.6.2E</b> Construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.	<b>SCI.7.2E</b> Construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data including recognizing patterns.	<b>SCI.8.2E</b> Construct line and bar graphs, tables, maps, and charts using tools to organize, examine, and evaluate data including extrapolating information to make predictions.	



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Nature of Science	Critical Thinking	<b>SCI.5.3A</b> Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	<b>SCI.6.3A</b> Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	<b>SCI.7.3A</b> Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	<b>SCI.8.3A</b> Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	<b>IPC.3A</b> Analyze, review, and critique scientific explanation, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.
		<b>SCI.5.3B</b> Draw inferences based on information related to promotional materials for products and services.	<b>SCI.6.3B</b> Draw inferences based on observations and data.	<b>SCI.7.3B</b> Draw inferences based on observations and data related to promotional materials for products and services.	<b>SCI.8.3B</b> Draw inferences based on observations, including data related to promotional materials for products.	<b>IPC.3B</b> Draw inferences based on data related to promotional materials for products and services and other real life scenarios.
		<b>SCI.5.3C</b> Represent the natural world using models and assess their limitations.	<b>SCI.6.3C</b> Represent the natural world using models and identify their limitations.	<b>SCI.7.3C</b> Represent the natural world using models and identify their limitations.	<b>SCI.8.3C</b> Represent the natural world using models and identify their limitations.	
		<b>SCI.5.3D</b> Evaluate the impact of research on scientific thought, society, and the environment.	<b>SCI.6.3D</b> Evaluate the impact of research on scientific thought, society, and the environment.	<b>SCI.7.3D</b> Evaluate the impact of research on scientific thought, society, and the environment.	<b>SCI.8.3D</b> Evaluate the impact of research on scientific thought, society, and the environment.	<b>IPC.3C</b> Evaluate the impact of research on scientific thought, society, and the environment and identify a design problem and use technology to implement a solution to the problem.
						<b>IPC.3D</b> Describe connections between physics and chemistry and future careers.
		<b>SCI.5.3E</b> Connect Grade 5 science concepts with the history of science and contributions of scientists such as astronomer Galileo Galilei, botanist George Washington Carver, and astronaut Ellen Ochoa.	<b>SCI.6.3E</b> Connect Grade 6 science concepts with the history of science and contributions of scientists.	<b>SCI.7.3E</b> Connect Grade 7 science concepts with the history of science and the contributions of scientists.	<b>SCI.8.3E</b> Connect Grade 8 science concepts with the history of science and the contributions of scientists.	<b>IPC.3E</b> Research and describe the history of physics, chemistry, and contributions of scientists.

Ⓢ Denotes Power Objectives



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Nature of Science	Tools	<p><b>SCI.5.4A</b></p> <p>Collect and analyze information using appropriate tools including calculators, microscopes, cameras, sound recorders, computers, hand lenses, metric rulers, metric thermometers, compasses, metric balances, hot plates, meter sticks, timing devices, magnets, collecting nets, and safety goggles.</p>	<p><b>SCI.6.4A</b></p> <p>Observe, collect, analyze, and record information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, field equipment, compasses, computers, and computer probes.</p>	<p><b>SCI.7.4A</b></p> <p>Collect, analyze, and record information to explain phenomenon using tools including beakers, Petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, timing devices, magnets, and compasses.</p>	<p><b>SCI.8.4A</b></p> <p>Collect, analyze, and record information using tools including beakers, Petri dishes meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices.</p>	
		<p><b>SCI.5.4B</b></p> <p>Demonstrate that repeated investigations may increase the reliability of results.</p>	<p><b>SCI.6.4B</b></p> <p>Propose, implement, and document the design process used to solve a problem or challenge and identify patterns in collected information using percent, average, range, and frequency.</p>	<p><b>SCI.7.4B</b></p> <p>Collect and analyze information to recognize patterns such as rates of change and to propose a design problem to test or model.</p>	<p><b>SCI.8.4B</b></p> <p>Extrapolate from collected information to make predictions.</p>	
	Science and Technology				<p><b>SCI.8.5A</b></p> <p>A Identify a design problem and propose a solution.</p>	
					<p><b>SCI.8.5B</b></p> <p>Design and test a model to solve the problem.</p>	
					<p><b>SCI.8.5C</b></p> <p>Evaluate the model and make recommendations for improving the model.</p>	



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### Strand 2: Living Systems

Strand	Grade 5	Grade 6	Grade 7	Grade 8	IPC	
Living Systems	Systems	Interdependence of Living Systems				
				<b>SCI.7.9B</b> Illustrate and describe how organisms including humans and other warm-blooded and cold-blooded animals maintain relatively constant internal conditions such as temperature and blood sugar while living in changing external environments.	ⓘ <b>SCI.8.6A</b> Describe interactions among systems in the human organism.	
			<b>SCI.6.12A</b> Identify and give examples that show an organism's response to internal stimuli such as hunger or thirst.	<b>SCI.7.11A</b> Analyze changes in organisms such as a fever or vomiting that may result from internal stimuli.	<b>SCI.8.6B</b> Identify feedback mechanisms that maintain equilibrium of systems including the role of the brain in regulating body temperature and heart rate, turgor pressure, and chemical reactions.	
			<b>SCI.6.12B</b> Investigate and describe the effect of external stimuli, including heat or light, on organisms.	<b>SCI.7.11B</b> Analyze responses in organisms to external stimuli found in the environment such as changes in temperature or the presence or absence of light.		
				<b>SCI.7.5A</b> Demonstrate how equilibrium is established, disrupted, and re-established in human body systems.		
		Ecosystems: Interdependence and Interaction				
			ⓘ <b>SCI.6.8C</b> Illustrate and describe the flow of energy including solar energy in living systems such as food chains and food webs.			
				ⓘ <b>SCI.7.12B</b> Observe and describe how organisms including producers, consumers, and decomposers live together in an environment and use existing resources.	ⓘ <b>SCI.8.11A</b> Identify that changes in environmental conditions, including the effects of human activities, can affect the survival of individuals and of species.	
		<b>SCI.5.5A</b> Describe some cycles, structures, and processes that are found in simple systems such as in the water cycle, food webs or the freezing, melting and boiling of water.	ⓘ <b>SCI.6.5A</b> Identify and describe how an ecosystem is the result of the combination of two or more systems and how the properties of the system are influenced by the parts which make up the system.	<b>SCI.7.12A</b> Investigate and describe the interactions among components of an ecosystem.	ⓘ <b>SCI.8.6C</b> Describe interactions among living and nonliving components within ecosystems including how the major source of energy in most ecosystems (sunlight) is converted into chemical energy.	



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		<b>Ecosystems: Interdependence and Interaction</b>				
Living Systems	Systems	<p style="text-align: center;"><b>SCI.5.5B</b></p> <p>Describe and explain some interactions that occur in simple systems such as with the Sun's energy in the water cycle, energy transfers in food webs or water particles in the freezing, melting and boiling of water.</p>	<p><b>SCI.6.5B</b></p> <p>Describe how the properties of an ecosystem are influenced by the parts which make up the system.</p>	<p style="text-align: center;"><b>SCI.7.8B</b></p> <p>Analyze and explain how radiant energy from the Sun is transferred into chemical energy through the process of photosynthesis.</p>	<p><b>SCI.8.14B</b></p> <p>Analyze how natural or human events may have contributed to the extinction of some species.</p>	
			<p><b>SCI.6.12C</b></p> <p>Illustrate and define components of an ecosystem to which organisms may respond.</p>	<p><b>SCI.7.12C</b></p> <p>Compare and contrast how different environments support different varieties of organisms.</p>		
				<p style="text-align: center;"><b>SCI.7.5B</b></p> <p>Observe and describe the role of ecological succession in maintaining equilibrium in an ecosystem.</p>		
				<p style="text-align: center;"><b>SCI.7.12D</b></p> <p>Analyze and describe the role of ecological succession in ecosystems.</p>		



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Living Systems	Properties and Patterns	<b>Structure &amp; Function</b>				
			<p style="text-align: center;"><b>Ⓢ SCI.6.10A</b></p> Differentiate between structure and function in plant and animal cells including cell membrane, cell wall, chloroplast, nucleus, vacuole, cytoplasm.			
			<p><b>SCI.6.10B</b></p> Investigate, research, and determine that all organisms are composed of cells and explain why the cell is described as the basic unit of life.			
			<p style="text-align: center;"><b>Ⓢ SCI.6.10C</b></p> Summarize and illustrate how structure complements function at different levels of organization including cells, tissues, organs, organ systems, organisms and populations.	<p style="text-align: center;"><b>Ⓢ SCI.7.9A</b></p> Compare, contrast, and analyze the function of human organ systems including circulatory, respiratory, integumentary, endocrine, digestive, excretory, skeletal, muscular, nervous, and reproductive systems.		
			<p style="text-align: center;"><b>Ⓢ SCI.7.6C</b></p> Relate forces to basic processes in living organisms such as an explanation of how contraction of muscle cells in the heart forces blood through vessels in the body and seedlings emerging from seeds during germination.			
	Change	<b>Cycles</b>				
		<p style="text-align: center;"><b>Ⓢ SCI.5.11A</b></p> Identify, observe, and evaluate actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow.				
		<p><b>SCI.5.6A</b></p> <b>Identify events and describe changes that occur on a regular basis such as in daily, weekly, lunar, and seasonal cycles.</b>				
		<p><b>SCI.5.6B</b></p> Identify and explain the significance of the water, carbon, and nitrogen cycles.				



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Living Systems	Change	Cycles					
		<b>SCI.5.6C</b> Describe and compare life cycles of similar organisms including common plants and animals.					
		Heredity					
			<b>SCI.6.11B</b> Identify cells as structures containing genetic materials.	<b>SCI.7.10A</b> Sequence diagrams depicting stages of cell division in plant and animal cells and investigate advantages and disadvantages of sexual and asexual reproduction.	<b>SCI.8.11B</b> Distinguish between inherited traits and other characteristics that result from interactions with the environment and compare and contrast homologous and analogous structures of organisms.		
		<b>SCI.5.10A</b> Differentiate traits that are inherited from parent to offspring in plants and animals from ones that are not inherited (environmental traits).	<b>SCI.6.11C</b> Describe the relationship between cells and genes, and Interpret the role of genes in inheritance.	<b>SCI.7.10C</b> Distinguish between dominant and recessive traits and recognize that inherited traits of an individual are contained in genetic material and explain the process of selective breeding.	<b>SCI.8.11C</b> Make predictions about possible outcomes of various genetic combinations of inherited characteristics using Punnett squares.		
		<b>SCI.5.10B</b> Give examples of learned characteristics that result from the influence of the environment such as a raccoon opening a lid of a garbage can.	<b>SCI.6.11A</b> Identify some changes in traits that can occur over several generations through natural occurrence and selective breeding.	<b>SCI.7.10B</b> Analyze how traits and adaptations increase the chances of organisms of different species to survive and reproduce in different habitats.			
		Adaptations					
		<b>SCI.5.9A</b> Compare the adaptive characteristics of organisms and evaluate how these improve the organism's ability to survive and reproduce in an ecosystem.					
		<b>SCI.5.9B</b> Analyze and describe adaptive characteristics that result in an organism's unique niche in an ecosystem such as an organism using its sticky tongue to feed on insects.					
		<b>SCI.5.9C</b> Predict some adaptive characteristics required for survival and reproduction by an organism in an ecosystem such as having a smooth body to swim better in the ocean.					



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### Strand 3: Physical Science

Strand		Grade 5	Grade 6	Grade 7	Grade 8	IPC
Physical science	Systems	<b>Matter and Energy Interactions</b>				
		<p><b>Ⓟ SCI.5.8A</b> Differentiate among forms of energy including light, heat, electrical and solar energy.</p>	<p><b>SCI.6.8A</b> Demonstrate how energy can be used to bring about changes in matter such as melting an ice cube.</p>		<p><b>Ⓟ SCI.8.10A</b> Illustrate interactions between matter and energy including specific heat.</p>	<p><b>Ⓟ IPC.6A</b> Describe, illustrate and apply energy transformations using the law of conservation of energy.</p>
		<p><b>SCI.5.5A</b> Describe some cycles, structures, and processes that are found in simple systems such as in the water cycle, food webs or the freezing, melting, and boiling of water.</p>				<p><b>Ⓟ IPC.6B</b> Investigate and demonstrate the movement of thermal energy through solids, liquids, and gases by convection, conduction, and radiation.</p>
			<p><b>Ⓟ SCI.6.9A</b> Investigate and identify energy transformations occurring during the production of energy for human use such as electrical energy to heat energy or heat energy to electrical energy and explain the principle of the conservation of energy.</p>			<p><b>IPC.6C</b> Analyze the efficiency of energy conversions that are responsible for the production of electricity such as from radiant, nuclear, and geothermal sources, fossil fuels such as coal, gas, oil and the movement of water or wind including generators.</p>
						<p><b>IPC.6D</b> Investigate, compare and evaluate the economic and environmental impact of using various energy sources such as rechargeable or disposable batteries, and solar cells.</p>
			<p><b>Ⓟ SCI.6.9B</b> Compare and contrast methods used for transforming energy in devices such as water heaters, cooling systems, or hydroelectric and wind-powered power plants and using empirical evidence, conclude why insulation is important to heating and cooling systems.</p>	<p><b>Ⓟ SCI.7.8A</b> Illustrate and list multiple examples of potential and kinetic energy in everyday life such as objects at rest, pendulums, and catastrophic events, movement of faults, falling water, and oxidizing food.</p>	<p><b>SCI.8.10C</b> Analyze the loss or gain of heat energy occurring during exothermic and endothermic chemical reactions and measure the energy change occurring in both types of reactions.</p>	<p><b>IPC.8B</b> Analyze energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks to classify them as endergonic or exergonic reactions.</p>
						<p><b>IPC.6E</b> Measure and investigate the thermal and electrical conductivity and resistance of various materials and explain results.</p>
		<p><b>SCI.5.8C</b> Demonstrate that electricity can flow in a closed circuit and can produce heat, light, sound and magnetic effects.</p>				<p><b>Ⓟ IPC.6F</b> Investigate the flow of electrical current in series and parallel circuits and solve mathematical problems using Ohm's Law in series and parallel circuits.</p>



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		<b>Matter and Interactions</b>					
<b>Physical science</b>	<b>Systems</b>					<b>IPC.6G</b> Investigate and analyze the relationship between an electric current and the strength of its magnetic field using simple electromagnets.	
						<b>IPC.6H</b> Analyze and describe the effects of heating and cooling processes in systems such as weather systems, living systems and mechanical systems.	
						<b>IPC.8D</b> Evaluate the role of isotopes, radioactive material and nuclear reactions in applications such as medicine and energy production.	
		<b>SCI.5.8D</b> Verify that vibrating an object can produce a sound.				<b>SCI.8.7B</b> Differentiate between longitudinal and transverse waves including how they are generated and can travel through different media.	<b>IPC.5A</b> Demonstrate wave types (transverse and longitudinal) and their characteristics through a variety of activities such as modeling with ropes and coils, activating tuning forks, and interpreting data on seismic waves
		<b>SCI.5.8B</b> Identify and demonstrate everyday examples of how light is reflected, such as from tinted windows, and refracted, such as in cameras, telescopes, eye glasses.					<b>IPC.5B</b> Demonstrate and describe types of wave interactions including interference, polarization, reflection, refraction, and resonance within various materials such as water, air, and glass
							<b>IPC.5C</b> Describe properties of waves in the electromagnetic spectrum and identify uses and applications of electromagnetic waves in the operation of technological devices such as fiber optics, optical scanners, and microwaves.



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Physical Science	Properties and Patterns	<b>Physical and Chemical Properties</b>				
		<p style="text-align: center;"><b>Ⓢ SCI.5.7A</b></p> <p>Classify and evaluate substances and their use based on their physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound.</p>				<p><b>IPC.7C</b></p> <p>Investigate and relate the constituents of various materials or objects (such as metal salts, light sources, fireworks displays, and stars) to the spectrographic data obtained from spectral-analysis techniques.</p>
		<p><b>SCI.5.7B</b></p> <p>Demonstrate that some mixtures maintain the physical properties of their ingredients and how these ingredients can be separated.</p>	<p style="text-align: center;"><b>Ⓢ SCI.6.7A</b></p> <p>Demonstrate that new substances can be made when two or more substances are chemically combined and evaluate the properties of the new substances to the original substances.</p>		<p><b>SCI.8.9A</b></p> <p>Demonstrate that substances may react chemically to form new substances and explain how properties of the new substances are different from the original substances.</p>	
		<p><b>SCI.5.7C</b></p> <p>Identify physical changes that can occur in solutions including the evaporation or crystallization of ingredients and the solubility of substances.</p>		<p><b>SCI.7.7A</b></p> <p>Analyze and identify everyday examples of chemical phenomena such as rusting and tarnishing of metals and burning of wood.</p>		<p style="text-align: center;"><b>Ⓢ IPC.8A</b></p> <p>Distinguish between physical and chemical changes in matter such as oxidation (corrosion), digestion, changes in states, and stages in the rock cycle.</p>
		<p><b>SCI.5.7D</b></p> <p>Observe and measure characteristic properties of substances that remain constant such as boiling points and melting points.</p>				
		<p style="text-align: center;"><b>Ⓢ SCI.5.5B</b></p> <p>Describe and explain some interactions that occur in simple systems such as with the Sun's energy in the water cycle, energy transfers in food webs or water particles in the freezing, melting and boiling of water.</p>				



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	<b>Physical and Chemical Properties</b>					
<b>Physical Science</b>	<b>Physical and Chemical Properties</b>		<p><b>Ⓢ SCI.6.7B</b> Classify metals, nonmetals, and metalloids by their physical properties such as state, density, solubility; and chemical properties such as the ability to rust, tarnish or burn.</p>	<p><b>SCI.7.7B</b> Describe physical properties of elements such as density, melting point, boiling point, malleability, and conductivity and identify how these characteristics are used to position an element on the periodic table.</p>	<p><b>Ⓢ SCI.8.9B</b> Interpret information on the periodic table to demonstrate an understanding that physical and chemical properties are used to group elements.</p>	<p><b>Ⓢ IPC.7D</b> Relate the physical properties, and the chemical behavior of an element including bonding and compound formation, to its placement on the periodic table.</p>
				<p><b>Ⓢ SCI.7.7C</b> Differentiate among elements, compounds, and mixtures and classify samples of matter from everyday life.</p>		<p><b>IPC.7E</b> Classify samples of matter from everyday life as being elements, compounds, or mixtures.</p>
					<p><b>SCI.8.8A</b> Describe the structure and parts of an atom including electrons, protons and neutrons.</p>	<p><b>IPC.7B</b> Research, describe, summarize, and critique the various models in the historical development of the atomic theory.</p>
					<p><b>SCI.8.8B</b> Describe the properties of an atom including mass, electrical charge, atomic number, and mass number for a variety of isotopes.</p>	
						<p><b>IPC.8E</b> Research, describe, and analyze the environmental and economic impact of the end-products of chemical reactions.</p>
					<p><b>SCI.8.9C</b> Interpret formulas and equations to express what happens in a chemical reaction and accurately balance simple equations.</p>	<p><b>Ⓢ IPC.8C</b> Write balanced chemical equations by applying the law of conservation of mass to simple chemical reactions.</p>
					<p><b>SCI.8.9D</b> Investigate, illustrate and communicate how physical and chemical properties influence the development and application of everyday materials such as cooking surfaces, insulation, adhesives and plastics.</p>	<p><b>Ⓢ IPC.7A</b> Investigate, describe, and differentiate between the physical properties of liquids and gases including density, viscosity, and buoyancy.</p>



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Physical Science	Physical and Chemical Properties	<b>Physical and Chemical Properties</b>				
		<p style="text-align: center;">Ⓢ SCI. 5.11A</p> <p>Identify, observe, and evaluate actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow.</p>				<p style="text-align: center;">Ⓢ IPC.9D</p> <p>Investigate the properties and characteristics of different types of solutions and analyze the various factors that affect solubility including temperature, pressure, and nature of the solute and solvent.</p>
						<p><b>IPC.9E</b> Investigate and demonstrate how factors such as particle size, temperature, agitation, and concentration influence the rate of dissolving.</p>
						<p><b>IPC.9A</b> Relate the structure of water to its function to its properties as the universal solvent.</p>
						<p><b>IPC.9B</b> Relate the concentration of ions in a solution to physical and chemical properties such as pH, electrolytic behavior, and reactivity.</p>
						<p><b>IPC.9C</b> Simulate and analyze the effects of acid rain on soil, buildings, statues, or microorganisms.</p>



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Strand		Grade 5	Grade 6	Grade 7	Grade 8	IPC
Physical Science	Change	<b>Force and Motion</b>				
			<p><b>SCI.6.6A</b></p> <p>Identify and describe the changes in position, direction of motion, and speed of an object when acted upon by force including an object going around a corner or moving in a circular path and that a change in direction of an object requires a force.</p>		<p><b>SCI.8.7A</b></p> <p>Demonstrate and calculate how unbalanced forces are associated with motion and may cause change in speed and direction of an object.</p>	<p><b>IPC.4A</b></p> <p>Calculate speed, momentum, acceleration, work, and power in systems such as in the human body, moving toys, and machines.</p>
		<p><b>SCI.5.12D</b></p> <p>Identify gravity as the force that makes objects fall to the ground, keeps planets in orbit around the Sun and the moon in orbit around the Earth.</p>	<p><b>SCI.6.6B</b></p> <p>Demonstrate that changes in motion can be measured and graphically represented and interpret graphs and tables of motion to determine distance traveled at specified instances of time.</p>	<p><b>SCI.7.6B</b></p> <p>Demonstrate, measure, and graphically represent motion of an object and classify examples of Newton's First Law of motion.</p>		<p><b>IPC.4B</b></p> <p>Investigate and describe applications of Newton's first law of motion, Newton's second law of motion and Newton's third law of motion in vehicle restraints, sports activities, geological processes, and satellite orbits.</p>
				<p><b>SCI.7.6A</b></p> <p>Demonstrate basic relationships between force and motion using simple machines and calculate the mechanical advantages for levers, pulleys, and inclined planes.</p>		<p><b>IPC.4C</b></p> <p>Analyze the effects caused by changing force or distance in simple machines as demonstrated in household devices, the human body and vehicles.</p>
						<p><b>IPC.4D</b></p> <p>Investigate, demonstrate and calculate the mechanical advantage and efficiency of simple machines such as levers, motors, wheels and axles, pulleys, and ramps</p>

 Denotes Power Objectives



What is it we want all students to learn?

## Science – Grade 5 - IPC Vertical Alignment Matrix

### Strand 4: Earth/Space Science

Strand		Grade 5	Grade 6	Grade 7	Grade 8	IPC
		<b>Matter and Energy Interactions</b>				
Earth/Space Systems	Systems	<b>SCI.5.5A</b> Describe some cycles, structures, and processes that are found in simple systems such as in the water cycle, food webs or the freezing, melting, and boiling of water.	<b>SCI.6.5A</b> Identify the solar system as a system that results from the combination of two or more other systems.			
		<b>SCI.5.5B</b> Describe and explain some interactions that occur in simple systems such as with the Sun's energy in the water cycle, energy transfers in food webs or water particles in the freezing, melting and boiling of water.	<b>SCI.6.5B</b> Describe how the properties of the solar system are influenced by the parts which make up the system.			
		ⓘ <b>SCI.5.6B</b> Identify and explain the significance of the water, carbon, and nitrogen cycles.	<b>SCI.6.8B</b> Explain and illustrate the interactions between matter and energy in the water cycle, and in the decay of biomass such as in a compost bin.		<b>SCI.8.10B</b> Analyze interactions between weather and ocean systems due to solar energy and make inferences and predictions about weather patterns.	
					<b>SCI.8.12B</b> Relate the roles of oceans to climate changes.	



## Science – Grade 5 - IPC Vertical Alignment Matrix

Strand		Grade 5	Grade 6	Grade 7	Grade 8	IPC	
Earth/Space Systems	Properties & Patterns	<b>Natural World</b>					
		<b>SCI.5.12C</b> Identify the physical characteristics of the Earth such as size, landforms and gravitational force and compare them to the physical characteristics of the moon.	<b>SCI.6.13A</b> Investigate and describe characteristics of objects in our solar system including the sun, planets, meteoroids, comets, asteroids, and moons.		<b>SCI.8.13A</b> Describe characteristics of the universe such as stars and galaxies and analyze the relationship between a star's magnitude and temperature using the HR diagram.		
		<b>SCI.5.12D</b> Identify gravity as the force that makes objects fall to the ground, keeps planets in orbit around the Sun and the moon in orbit around the Earth.			<b>SCI.8.13B</b> Explain the use of light-years to describe distances in the universe.		
					<b>SCI.8.13C</b> Analyze and compare and contrast historical scientific theories of the origin of the universe.		
		<b>SCI.5.6A</b> Identify events and describe changes that occur on a regular basis such as in daily, weekly, lunar, and seasonal cycles.		<b>SCI.7.13A</b> Analyze the relationship between the tilt of the Earth on its axis as it rotates and revolves around the sun and the seasons and investigate how the spin of the earth accounts for the length of a day.			
				<b>SCI.7.13B</b> Identify and illustrate how the relative position of the Sun, moon, and Earth causes such phenomena as moon phases, solar and lunar eclipses, and tides.			
			<b>SCI.6.13B</b> Research and describe types of equipment and transportation needed for space travel and propose future technology applications for space exploration.				

Ⓢ Denotes Power Objectives



What is it we want all students to learn?

## Science – Grade 5 - IPC Vertical Alignment Matrix

Strand	Grade 5	Grade 6	Grade 7	Grade 8	IPC	
Earth/Space Systems	Earth's Materials					
	Properties and Patterns		<p><b>☉ SCI.6.14A</b> Illustrate and describe the rock cycle and the processes involved in the formation of each type of rock including the identification of the minerals which form the rocks.</p>		<p><b>☉ SCI.8.12A</b> Analyze and predict the sequence of events in the rock cycle and lunar cycle that causes tides.</p>	
			<p><b>☉ SCI.6.14B</b> Identify relationships between groundwater and surface water in a watershed including the water table, zone of saturation and zone of aeration.</p>			
			<p><b>☉ SCI.6.14C</b> Describe components of the atmosphere, including oxygen, nitrogen, and water vapor, and identify how the roles of atmosphere movement such as trade winds and jet streams influence local and national weather patterns.</p>		<p><b>☉ SCI.8.12C</b> Predict the results of modifying the Earth's nitrogen, water, and carbon cycles.</p>	
		<p><b>☉ SCI.5.12A</b> Interpret how landforms are the result of a combination of constructive and destructive forces such as deposition of sediment, weathering, and erosion.</p>		<p><b>☉ SCI.7.14B</b> Analyze factors which contribute to regional erosion, deposition, and weathering and evaluate conservation plans to prevent negative impact on the environment.</p>		
	Earth's Forces					
	Change	<p><b>SCI.5.11B</b> Draw conclusions about "what happened before" using data such as from tree-growth rings and sedimentary rock sequences.</p>	<p><b>SCI.6.6C</b> Analyze forces that shape features of the Earth including uplifting, movement of water and volcanic action.</p>	<p><b>SCI.7.14A</b> Describe and predict the impact of different catastrophic events on Earth including how heat (thermal) energy flow and movement (convection currents) beneath Earth's crust cause events such as earthquakes, volcanoes, and tsunamis.</p>	<p><b>☉ SCI.8.14A</b> Predict land features resulting from gradual changes such as mountain building, beach erosion, land subsidence, and explain the role of plate tectonics in shaping Earth's surface.</p>	
		<p>SCI. 5.11A Identify, observe, and evaluate actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow.</p>				
		<p><b>☉ SCI.5.11C</b> Identify processes and materials that led to the formation of natural resources such as trees, fossil fuels, rocks, soil, water, and gases of the atmosphere and classify them as renewable, nonrenewable, or inexhaustible resources.</p>	<p><b>SCI.6.9C</b> Research and describe energy types from their source to their use and determine if the type is renewable, nonrenewable, and inexhaustible.</p>	<p><b>SCI.7.14C</b> Make inferences and draw conclusions about effects of human activities on Earth's renewable, non-renewable, and inexhaustible resources.</p>	<p><b>SCI.8.14C</b> Investigate and describe how human activities have modified soils, water and air quality.</p>	
		<p><b>SCI.5.12B</b> Describe processes responsible for the formations of coal, oil, gas, and minerals.</p>				

