Snapshot – Grade 6 Science

ST. ANN'S CATHOLIC SCHOOL
FAITH, KNOWLEDGE AND CHARACTER

Catholic Identity Standards		
6.0	**Catholic identity standards.** The student understands and integrates the content of what is learned into their faith and daily life.	
Ways to Grow	6.0A	recognize that every human life is sacred because each person is created and loved by God
	6.0B	describe ways to take part in/be responsible to the community by discerning and using our God-given gifts
	6.0C	recognize and oppose unjust social structures and work toward justice for all
	6.0D	see God at work in all things and as expressed in the sacraments
	6.0E	connect scripture, tradition, and the models of Mary and the saints to guide, grow, and deepen faith

Scientific and Engineering Practices	
6.1	The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models.
6.1A	ask questions and define problems based on observations or information from text, phenomena, models, or investigations
6.1B	use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems
6.1C	use appropriate safety equipment and practices during laboratory, classroom, and field investigations
6.1D	use appropriate tools to gather data
6.1E	collect quantitative data using the International System of Units (SI) and qualitative data as evidence
6.1F	construct appropriate tables, graphs, maps, and charts using repeated trials and means to organize data
6.1G	develop and use models to represent phenomena, systems, processes, or solutions to engineering problems
6.1H	distinguish between scientific hypotheses, theories, and laws

Scientific and Engineering Practices	
6.2	The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs.
6.2A	identify advantages and limitations of models such as their size, scale, properties, and materials
6.2B	analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations
6.2C	use mathematical calculations to assess quantitative relationships in data
6.2D	evaluate experimental and engineering designs

Scientific and Engineering Practices	
6.3	The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions.
6.3A	develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories
6.3B	communicate explanations and solutions individually and collaboratively in a variety of settings and formats
6.3C	engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence

Scientific and Engineering Practices	
6.4	The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society.
6.4.DS4	accept that scientific knowledge is a call to serve and not simply a means to gain power, material prosperity, or success*
6.4A	relate the impact of past and current research on scientific thought and society, including the process of science, cost-benefit analysis, and contributions of diverse scientists as related to the content
6.4B	make informed decisions by evaluating evidence from multiple appropriate sources to assess the credibility, accuracy, cost-effectiveness, and methods used
6.4C	research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a STEM field to investigate STEM careers
6.4.IS11	list the basic contributions of significant Catholics to science such as Galileo, Copernicus, Mendel, and others*

Recurring Themes and Concepts

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6.5	The student understands that recurring themes and concepts provide a framework for making connections across disciplines.
6.5A	identify and apply patterns to understand and connect scientific phenomena or to design solutions
6.5B	identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems
6.5C	analyze how differences in scale, proportion, or quantity affect a system's structure or performance
6.5D	examine and model the parts of a system and their interdependence in the function of the system
6.5E	analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems
6.5F	analyze and explain the complementary relationship between the structure and function of objects, organisms, and systems
6.5G	analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems

Matter and Energy

6.6	The student knows that matter is made of atoms, can be classified according to its properties, and can undergo changes.		
Applied Standards		**Supporting Standards**	
6.6A	compare solids, liquids, and gases in terms of their structure, shape, volume, and kinetic energy of atoms and molecules		
6.6B	investigate the physical properties of matter to distinguish between pure substances, homogeneous mixtures (solutions), and heterogeneous mixtures	6.6D	compare the density of substances relative to various fluids
6.6C	identify elements on the periodic table as metals, nonmetals, metalloids, and rare Earth elements based on their physical properties and importance to modern life		
6.6E	identify the formation of a new substance by using the evidence of a possible chemical change, including production of a gas, change in thermal energy, production of a precipitate, and color change		

Force, Motion, and Energy

6.7	The student knows the nature of forces and their role in systems that experience stability or change.		
6.7A	identify and explain how forces act on objects, including gravity, friction, magnetism, applied forces, and normal forces, using real-world applications	6.7B	calculate the net force on an object in a horizontal or vertical direction using diagrams and determine if the forces are balanced or unbalanced
		6.7C	identify simultaneous force pairs that are equal in magnitude and opposite in direction that result from the interactions between objects using Newton's Third Law of Motion

Force, Motion, and Energy

6.8	The student knows that the total energy in systems is conserved through energy transfers and transformations.
6.8A	compare and contrast gravitational, elastic, and chemical potential energies with kinetic energy
6.8B	describe how energy is conserved through transfers and transformations in systems such as electrical circuits, food webs, amusement park rides, or photosynthesis
6.8C	explain how energy is transferred through transverse and longitudinal waves

Earth and Space

6.9	The student models the cyclical movements of the Sun, Earth, and Moon and describes their effects.		
6.9A	model and illustrate how the tilted Earth revolves around the Sun, causing changes in seasons	6.9.IS2	describe the relationships, elements, underlying order, harmony, and meaning in God's creation*
6.9B	describe and predict how the positions of the Earth, Sun, and Moon cause daily, spring, and neap cycles of ocean tides due to gravitational forces		

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Earth and Space		
6.10	The student understands the rock cycle and the structure of Earth.	
6.10A	differentiate between the biosphere, hydrosphere, atmosphere, and geosphere and identify components of each system	
6.10B	model and describe the layers of Earth, including the inner core, outer core, mantle, and crust	
6.10C	describe how metamorphic, igneous, and sedimentary rocks form and change through geologic processes in the rock cycle	

Earth and Space		
6.11	The student understands how resources are managed.	
6.11.DS3	accept the premise that nature should not be manipulated simply at man's will or only viewed as a thing to be used, but that man must cooperate with God's plan for himself and for nature*	
6.11A	research and describe why resource management is important in reducing global energy, poverty, malnutrition, and air and water pollution	6.11B explain how conservation, increased efficiency, and technology can help manage air, water, soil, and energy resources 6.11.IS5 explain the processes of conservation, preservation, overconsumption, and stewardship in relation to caring for that which God has given to sustain and delight us*

Organisms and Environments		
6.12	The student knows that interdependence occurs between living systems and the environment.	
6.12A	investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as availability of light and water, range of temperatures, or soil composition	
6.12B	describe and give examples of predatory, competitive, and symbiotic relationships between organisms, including mutualism, parasitism, and commensalism	
6.12C	describe the hierarchical organization of organism, population, and community within an ecosystem	

Organisms and Environments		
6.13	The student knows that organisms have an organizational structure and variations can influence survival of populations.	
6.13B	identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic, unicellular and multicellular, and autotrophic and heterotrophic	6.13A describe the historical development of cell theory and explain how organisms are composed of one or more cells, which come from pre-existing cells and are the basic unit of structure and function
6.13C	describe how variations within a population can be an advantage or disadvantage to the survival of a population as environments change	