Parent Guide

Grade Seven Science Curriculum

Diocese of Cleveland

Below is a list of the skills your child will be taught in Grade Seven.
As parents, you are encouraged to support the work of your child's teacher in helping your child acquire each of these skills.

Capacities of the Literate Individual	
	They demonstrate independence.
	They build strong content knowledge.
	They respond to the varying demands of audience, task, purpose.
	They comprehend as well as critique.
	They value evidence.
	They use technology and digital media strategically and capably.
	They come to understand other perspectives and cultures.
Scientific Process and Inquiry	
Scientific Inquiry and Application (Ohio Revised Science Standards and Model Curriculum)	
	Identify questions that can be answered through scientific investigations.
	Design and conduct a scientific investigation.
	Use appropriate mathematics, tools and techniques to gather data and information.
	Analyze and interpret data.
	Develop descriptions, models, explanations and predictions.
	Think critically and logically to connect evidence and explanations
	Recognize and analyze alternative explanations and predications.
	Communicate scientific procedures and explanations.
Scientific Process (Diocesan Curriculum)	
	Formulate and identify questions to guide investigations/experiment.
	Identify simple independent and dependent variables.
	Explain that variables and controls can affect the results of an investigation and that ideally one variable should be tested at a time; however, it is not always possible to control all variables.
	Design and conduct scientific investigations.
	Communicate scientific findings to others through a variety of methods (written, oral, recorded, and pictorial observations); incorporating the use of third person.
Scientific Interpretation (Diocesan Curriculum)	
	Analyze alternative scientific explanations and predictions and recognize that there may be more than one good way to interpret a given set of data.
	Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence.
	Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables.
Scientific Tools and Safety (Diocesan Curriculum)	
	Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific experiments.
	Use appropriate math equations/functions to express scientific findings.
Ethical Practices Reflecting Catholic Social Justice Teaching (Diocesan Curriculum)	
	Interact with living things and the environment in ways that promote respect.
	Describe how scientific advancements influence quality of life and the ways people act and interact through its products and processes (i.e., research, selective breeding of animals, hybridizing of plants, organic gardening, solar homes).

Ethical Practices Reflecting Catholic Social Justice Teaching (Continued)	
	Explain how social needs, attitudes and values influence the direction of technological development.
	Show that the reproducibility of results is essential to reduce bias in scientific investigations.
Earth and Space Science – Hydrologic Cycle	
	The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.
	a. Thermal energy is transferred as water changes state throughout the cycle.
	b. The cycling of water in the atmosphere is an important part of weather patterns on Earth.
	c. The rate at which water flows through soil and rock is dependent upon the porosity and permeability of the soil or rock.
	d. Contamination can occur within any step of the hydrologic cycle.
	e. Ground water is easily contaminated as pollution present in the soil or spilled on the ground surface moves into the ground water and impacts numerous water sources.
Earth and Space Science – Atmosphere	
	The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
	a. The atmosphere is held to the Earth by the force of gravity.
	b. The atmosphere has defined layers.
	c. There are defined layers of the atmosphere that have specific properties, such as temperature, chemical composition and physical characteristics.
	d. Gases in the atmosphere include nitrogen, oxygen, water vapor, carbon dioxide and other trace gases.
	e. Biogeochemical cycles illustrate the movement of specific elements or molecules (such as carbon or nitrogen) through the lithosphere, biosphere, hydrosphere and atmosphere.
Earth and Space Science – Currents	
	Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
	a. The sun is the major source of energy for wind, air and ocean currents and the hydrologic cycle.
	b. As thermal energy transfers occur in the atmosphere and ocean, currents form.
	c. Large bodies of water can influence weather and climate.
	d. The jet stream is an example of an atmospheric current, and the Gulf Stream is an example of an oceanic current.
	e. Ocean currents are influenced by factors other than thermal energy, such as water density, mineral content (such as salinity), ocean floor topography and Earth's rotation.
	f. All of these factors delineate global climate patterns on Earth.
	g. Regional temperature and precipitation contribute to the identification of climatic zones.
Earth and Space Science – Earth, Sun, and Moon	
	The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.
	a. The moon's orbit and its change of position relative to the Earth and sun result in different parts of the moon being visible from Earth (phases of the moon).
	b. A solar eclipse is when Earth moves into the shadow of the moon (during a new moon).
	c. A lunar eclipse is when the moon moves into the shadow of Earth (during a full moon).
	d. The parts of an eclipse are umbra and penumbra.
	e. Gravitational force between the Earth and the moon causes daily oceanic tides (neap and spring).
	f. When the gravitational forces from the sun and moon align (at new and full moons) spring tides occur.
	g. When the gravitational forces of the sun and moon are perpendicular (at first and last quarter moons), neap tides occur.

Life Science – Cycles of Matter and Flow of Energy	
	Matter is transferred continuously between one organism to another and between organisms and their physical environments.
	a. Plants use the energy in light to make sugars out of carbon dioxide and water (photosynthesis).
	b. The sugar materials can be used and immediately stored for later use.
	c. Organisms that eat plants break down plant structures to produce the materials and energy they need to survive. Then they are consumed by other organisms.
	d. Energy can transform from one form to another in living things.
	e. Animals get energy from oxidizing food, releasing some of its energy as heat.
	f. The total amount of matter and energy remains constant, even though its form and location change. (Conservation of Matter and Energy)
	g. Chemical reactions can be explained as the rearrangement of atoms in molecules.
	h. Elements are continuously recycled.
Life Science – Biomes	
	In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.
	a. Biomes are regional ecosystems characterized by distinct types of organisms that have developed under specific soil and climatic conditions.
	b. The variety of physical (abiotic) conditions that exists on Earth gives rise to diverse environments (biomes) and allows for the existence of a wide variety of organisms (biodiversity).
	c. Ecosystems are dynamic in nature; the number and types of species fluctuate over time.
	d. Disruptions, deliberate or inadvertent, to the physical (abiotic) or biological (biotic) components of an ecosystem impact the composition of an ecosystem.
Physical Science – Atoms and Elements	
	The properties of matter are determined by the arrangement of atoms.
	a. Elements can be organized into families with similar properties, such as highly reactive metals, less-reactive metals, highly reactive nonmetals and some gases that are almost completely nonreactive.
	b. Substances are classified according to their properties, such as metals and acids.
	c. When substances interact to form new substances, the properties of the new substances may be very different from those of the old, but the amount of mass does not change.
Physical Science – Conservation of Matter and Energy	
	Energy can be transformed or transferred but is never lost.
	a. When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer. (Conservation of Energy)
	b. When energy is transformed from one form to another, the total amount of energy remains the same. (Conservation of Matter)
Physical Science – Energy Transfer	
	Energy can be transferred through a variety of ways.
	a. Kinetic energy is the energy a body possesses by virtue of being in motion.
	b. Potential energy is the energy possessed by a body by virtue of its position relative to others, stresses within itself, electric charge, and other factors.
	c. Mechanical energy can be transferred when objects push or pull on each other over a distance.
	d. Electromagnetic waves transfer energy when they interact with matter.
	e. Thermal energy can be transferred through radiation, convection and conduction.
	f. Electrical energy transfers when an electrical source is connected in a complete electrical circuit to an electrical device.
	g. Electricity can be measured through current, voltage and resistance.
	h. Renewable energy systems include wind, geothermal, water and solar.

Physical Science – Energy Transfer (continued)	
	i. The types of waves used include seismic, oceanic, sound and light.
	j. Waves can be classified as transverse or longitudinal.
	k. Waves are described in terms of speed, wavelength, amplitude and frequency.
	l. Sound waves are described by pitch and frequency.
Literacy in Science & Technical Subjects – Reading Science & Technical Subjects (See Standards for further delineation of each of the following statements.)	
	Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
	Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
	Analyze how and why individuals, events, or ideas develop and interact over the course of a text.
	Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
	Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
	Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
	Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
	Read and comprehend complex literary and informational texts independently and proficiently.
Literacy in Science & Technical Subjects – Writing (See Standards for further delineation of each of the following statements.)	
	Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.
	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
	Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
	Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
	Draw evidence from literary or informational texts to support analysis, reflection, and research.
Literacy in Science & Technical Subjects – Speaking and Listening (See Standards for further delineation of each of the following statements.)	
	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
	Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.
	Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
	Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

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