Parent Guide

Grade Six Science Curriculum

Diocese of Cleveland

Below is a list of the skills your child will be taught in Grade Six.

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)	
	Explain that there are not fixed procedures for guiding scientific investigations; the nature of an investigation/experiment determines the procedures needed.
	Develop and demonstrate the formulation of a hypothesis and analyze and interpret data from an investigation/experiment.
	Identify the experimental variables.
	Communicate scientific findings to others through a variety of methods (written, oral, recorded, and pictorial observations).
Scientific Interpretation (Diocesan Curriculum)	
	Distinguish between observation and inference.
	Explain that a single example can never prove that something is always correct, but sometimes a single example can disprove something.
	Explain why results of an experiment are sometimes different (unexpected and unrealized differences in methods or in the investigations; errors in observations).
Scientific Tools and Safety (Diocesan Curriculum)	
	Choose appropriate tools or instruments and use relevant safety procedures to complete scientific experiments.
	Use appropriate math functions/formulas to express scientific findings (density, mass, etc.).
Ethical Practices Reflecting Catholic Social Justice Teaching (Diocesan Curriculum)	
	Interact with living things in the environment in ways that promote respect.
	Keep accurate unbiased records.
	Recognize that scientific developments can have positive and negative effects on everyday life and society.

	Earth and Space Science – Minerals
	Minerals have specific, quantifiable properties.
	a. Minerals are naturally occurring, inorganic solids that have a defined chemical composition.
	b. Minerals have properties that can be observed and measured.
	c. Minerals form in specific environments.
	Earth and Space Science – Rocks
	Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
	a. Most rocks are composed of one or more minerals, but there are a few types of sedimentary rocks that contain organic material, such as coal.
	b. The composition of the rock, types of mineral present, mineral arrangement, and/or mineral shape and size can be used to identify the rock and to interpret its history of formation, breakdown (weathering) and transport (erosion).
	Igneous, metamorphic and sedimentary rocks form in different ways.
	a. Magma or lava cools and crystallizes to form igneous rocks.
	b. Heat and pressure applied to existing rock forms metamorphic rocks.
	c. Sedimentary rock forms as existing rock weathers chemically and/or physically and the weathered material is compressed and then lithifies.
	d. Each rock type can provide information about the environment in which it was formed.
	Earth and Space Science – Soil and Energy Resources
	Soil is unconsolidated material that contains nutrient matter and weathered rock.
	a. Soil formation occurs at different rates and is based on environmental conditions, types of existing bedrock and rates of weathering.
	b. Soil forms in layers known as horizons.
	c. Soil horizons can be distinguished from one another based on properties that can be measured.
	Rocks, minerals and soils have common and practical uses.
	a. Nearly all manufactured material requires some kind of geologic resource.
	b. Most geologic resources are considered nonrenewable.
	c. Rocks, minerals and soil are examples of geologic resources that are nonrenewable.
	d. Fossil fuels are nonrenewable sources of energy.
	Life Science – Cells
	Cells are the fundamental unit of life.
	a. All living things are composed of cells.
	b. Different body tissues and organs are made of different kinds of cells.
	c. The ways cells function are similar in all living organisms.
	All cells come from pre-existing cells.
	a. Cells repeatedly divide resulting in more cells and growth and repair in multi-cellular organisms.
	Cells carry on specific functions that sustain life.
	a. Many basic functions of organisms occur in cells.
	b. Cells take in nutrients and energy to perform work, like making various molecules required by that cell or an organism.
	c. Every cell is covered by a membrane that controls what can enter and leave the cell.
	d. Within the cell are specialized parts for the transport of materials, energy capture and release, protein building, waste disposal, information feedback and movement.

Life Science – Cells (continued)	
	Living systems at all levels of organization demonstrate the complementary nature of structure and function.
	a. The level of organization within organisms includes cells, tissues, organs, organ systems and whole organisms.
	b. Whether the organism is single-celled or multi-cellular, all of its parts function as a whole to perform the tasks necessary for the survival of the organism.
	c. Organisms have diverse body plans, symmetry and internal structures that contribute to their being able to survive in their environments.
Physical Science – Matter	
	All matter is made up of small particles called atoms.
	a. Each atom takes up space, has mass and is in constant motion.
	b. Mass is the amount of matter in an object.
	c. Elements are a class of substances composed of a single kind of atom.
	d. Molecules are the combination of two or more atoms that are joined together chemically.
	e. Compounds are composed of two or more different elements.
	f. Each element and compound has properties, which are independent of the amount of the sample.
	g. Similarities and differences are found among elements.
	h. Three states of matter are solid, liquid, and gas.
	Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.
	a. When substances undergo changes of state, neither atoms nor molecules themselves are changed in structure.
	b. Thermal energy is a measure of the motion of the atoms and molecules in a substance.
	c. Mass is conserved when substances undergo changes of state.
	Students will know and understand the following as they relate to these standards.
	a. Volume vs. mass.
	b. Formulas of mass and volume
	c. Density in relation to mass and volume
	d Temperature vs. thermal energy
Physical Science – Motion	
	There are two categories of energy: kinetic and potential.
	a. Objects and substances in motion have kinetic energy.
	b. Objects and substances can have energy as a result of their position (potential energy).
	An object's motion can be described by its speed and the direction in which it is moving.
	a. An object's position and speed can be measured and graphed as a function of time.
	b. The gravitational potential energy of an object is determined by its height.
Literacy Science & Technical Subjects – Reading: Science & Technical Subjects	
	Cite specific textual evidence to support analysis of primary and secondary sources.
	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Literacy Science & Technical Subjects – Reading: Science & Technical Subjects (continued)	
	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
	Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
	Provide a concluding statement or section that follows from and supports the argument presented.
Literacy in Science & Technical Subjects – Writing	
	Write arguments focused on discipline-specific content.
	Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
	Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
	Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
	Provide a concluding statement or section that follows from and supports the argument presented.
	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
	Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting, graphics, and multimedia when useful to aiding comprehension.
	Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
	Use precise language and domain-specific vocabulary to inform about or explain the topic.
	Establish and maintain a formal style and objective tone.
	Provide a concluding statement or section that follows from and supports the information or explanation presented.
	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 present the relationships between information and ideas clearly and efficiently.
	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
	Draw evidence from informational texts to support analysis, reflection, and research.
	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
Literacy in Science & Technical Subjects – Speaking and Listening	
	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
	Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
	Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
	Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing

Literacy in Science & Technical Subjects – Speaking and Listening (continued)	
	Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
	Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.
	Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.
	Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.
	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Notes:

National Governors Association Center for Best Practices, Council of Chief State School Officers. *Common Core State Standards.* National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington, D.C., 2010.