

Grades 6, 7, 8
Science

Science as Inquiry		Q1	Q2	Q3	Q4
	Identify questions that can be answered through scientific investigations	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Design and safely conduct a controlled experiment using the scientific method	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Use appropriate tools and techniques to gather, analyze, interpret, and present data	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Recognize and analyze alternative explanations and predictions and raise their own questions for further research	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Communicate scientific procedures and explanations, as well as the importance and implications of experimental results to peers, teachers, and other adults	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Use inferences to help decide possible results of their investigations and use observations to check inferences	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Use accepted scientific knowledge, models, and theories to explain their results and to raise further questions about their investigations	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
+Physical Science		Q1	Q2	Q3	Q4
	Develop an understanding of the physical and chemical properties of matter		6I, 8D	7D	
	Develop an understanding of the major ideas of atomic theory and molecular theory and be able to describe the physical and chemical interactions among substances		6I, 8D		7D
	Explain how models of atomic structure have changed over time including the strengths and weaknesses of each model		8D		
	Give a basic explanation of gas laws, Archimedes' Principle, and Bernoulli's Principle and recognize their real-life applications	7D			
	Identify the Law of Conservation of Energy	7D			
	Model how all matter is composed of atoms, consisting of protons, neutrons, and electrons		6I, 8D	7D	
	Understand the role of electrons in bonding		8P		
	Understand that each element of the Periodic Table is identified by its atomic number, corresponding to the number of protons in the nucleus		8D		
	Understand the Periodic Table as an organizational system		8P		
	Know that materials that contain equal proportions of positive and negative charges are electrically neutral, but a very small excess or deficit of negative charges produces noticeable electric forces		8P		
	Know that electromagnetic forces exist within and between atoms	8D			
	Know that nuclear forces are much stronger than electromagnetic forces, which are vastly stronger than magnetic forces				8D
	Investigate the motion of objects and explain motion in terms of speed, velocity, acceleration, momentum, and Newton's Laws of Motion, and be able to apply to real-life situations		7D		
	Understand general concepts related to gravitational force		7D		6I, 8P
	Know that the strength of the electric force between two charged objects is proportional to the charges	8P			

	Describe and investigate the properties of light, heat, gravity, radio waves, magnetic fields, electrical fields, and sound waves and their interactions with common objects	6D,8P	6D	7P,8D	8P
	Communicate that many devices have been designed to convert energy from one form to another		7D		
	Infer that as energy transformation occur, some energy escapes as heat, sound, or light	6D	7D		
	Evaluate decisions about the future use of energy resources				7D
	Show how machines can be used to do work more efficiency		7P		
	Investigate how work can be measured		7P		
	Understand that the sun is a major source of energy for the Earth			8D	
	Show that light interacts with matter by transmission, absorption, or reflection	6P			
	Know how different materials respond to electric current	8P			
	Demonstrate how things that absorb light often transmit heat		6I	7D	
	Show that light travels in straight lines unless refracted or reflected	6D			
	Demonstrate that light can be refracted or reflected with lenses	6D			
	Explain that photosynthesis is the process of using light to make food			6P,7P	
	Know that electric currents can produce magnetic forces and magnets can produce electric currents	8P			
	Know that magnetic forces are very closely related to electric forces and can be thought of as different aspects of a single electromagnetic force	8D			
	Understand the interplay of electromagnetic forces is the basis for electric motors, generators, radio, television, and other technologies	8D			
	Identify visible light as one component of the electromagnetic spectrum	8D			
	Show that light is essential for vision	6P			
	Describe how sound travels in waves		6P		
	Explain that sound waves have wavelength, frequency, and amplitude	8P	6D		
	Observe and demonstrate that sound is affected by the medium through which it travels		6P		
	Show how the ear is a receptor for sound		6P		
	Articulate the component parts of <i>human dignity</i>	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Discover that living organisms carry on basic life processes			6I,7D	
	Identify the levels of organization in living things: cells, tissues, organs, systems, and organisms			6I,7D	8P
	Explain that a human organism has interactive systems		8P	6I,7D,8D	
	Describe how diseases are the result of internal failure of body systems	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 P

Life Science		Q1	Q2	Q3	Q4
	Know that animals and plants have a great variety of body plans and internal structures that serve specific functions for survival		7D	6D,7D	
	Know the evidence that supports the idea that there is unity among organisms despite the fact that some species look very different		8P	6I,7D	

	Know how organisms are classified into a hierarchy of groups and subgroups based on similarities that reflect their evolutionary relationships			6I	8P
	Know the structure and function of the different parts of a cell			6I,7P	
	Know how an organism's ability to regulate its internal environment enables the organism to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment			6P,8D	7D
	Know that organisms can react to internal and environmental stimuli through behavioral responses which may be determined by heredity or by past experience			8P	
	Describe photosynthesis			6P	7P
	Identify the various plant tissues and explain their functions			6D	7P
	Explain plant responses to the environment			6I	
	Explain the life cycle of a flowering plant			6I	
	Understand that sexual and asexual reproduction are necessary to the continuation of species			6I	8D
	Explain that in sexual reproduction, females produce eggs and males produce sperm, resulting in a new individual				8D
	Communicate within the context of Catholic teaching, that certain methods of birth control may prevent pregnancy and the spread of sexually transmitted diseases				8P
	Describe how chromosomes are contained in both egg and sperm, and that genes found on chromosomes carry genetic instructions for the new individual				8D
	Model how an inherited trait is determined by one or more genes and how a Punnett Square demonstrates the potential combination of traits				8D
	Analyze how the development of a growing embryo and fetus takes place at a predictable rate and in an expected sequence during pregnancy				8D
	Realize that both heredity and the environment contribute to the development of living things	6,7,8 D	6,7,8 D	6,7,8 D	8P
	Know the chemical and structural properties of DNA and its role in specifying the characteristics of an organism				8D
	Know ways in which genes may be altered and combined to create genetic variation within species				8D
	Know that new inheritable characteristics can only result from new combinations of existing genes in an organism's cell			8D	
	Know that mutations and new gene combinations may have positive' negative, or no effect on the organism			8D	
	Know features of human genetics				8D
	Know how variation of organisms within a species increases the chance of survival of the species, and how the great diversity of species on Earth increases the chance of survival of life in the event of major global changes		8D	6I,8P	
	Know ways in which species interact and depend on one another in an ecosystem		6D	8P	7D
	Know factors that support the number and types of organisms an ecosystem can support		6D	8P	7D
	Know the relationships that exist among organisms in food chains and food webs	6D	8P		
	Know that the fossil record through geological evidence documents the appearance, diversifications, and extinction of many life forms			7D	8P
	Know the basic ideas related to biological evolution				8D

	Understand the concept of extinction and its importance in biological evolution				8D
	Know that the basic idea of evolution is that the Earth's present-day life forms evolved from earlier, distinctly different species				8D
	Know that natural selection leads to organisms that are well suited for survival in particular environments				8D
	Know the history of the origin and evolution of life on Earth			8D	
	Describe how ecosystems encompass the interactions among biotic and abiotic components in an environment			6D	
	Communicate that ecosystems are composed of a number of communities, each having characteristic plant and animals adapted to the environmental conditions of the area			6D	
	Show how energy moving through the ecosystem can be integrated with food chains and food webs			6D,8P	
	Explain that consumers receive energy from the food they eat		6D	8P	7P
	Describe how food webs illustrate the flow of energy among producers, consumers, and decomposers		6D	8P	7P
	Describe how water, light, and temperature are important abiotic factors for living things			6D	
	Understand that though the process of succession, communities change over time	6D	6P	8P	
	Relate that the factors affecting the size of a population are: the resources available, predation, climate, and disease	6I		6D,8D	
	Describe the eight biomes in terms of their distinct biotic and abiotic characteristics			6D,8P	7D
	Explain how adaptations help organisms to survive in their particular habitat			6D,7D	
	Describe how plants require sun, space, water, and soil nutrients		6I	6D	
	Describe how plants producers and are the only components of an ecosystem that transform the sun's energy into food		6I	6D	7D
	Explain that weather is determined by the combination of heat, moisture, and the movement of air masses		8P		
	Investigate how various instruments are used to collect data and make predictions about the weather		8P		
	Understand that the sun's energy drives the water cycle		6D,8P		
	Illustrate how winds usually flow from high pressure to areas of low pressure			8D	
	Analyze temperature, pressure, and the Coriolis Effect as causes of wind and water currents			8D	
	Describe how global patterns of atmospheric movement influence local weather			8D	
	Examine how geographic features have a major effect on climates			8D	
Earth and Space Science		Q1	Q2	Q3	Q4
	Know that the Earth is comprised of layers: lithosphere, hydrosphere, and atmosphere	6I	7D	8P	
	Explain that to reduce loss of personal property and life, people should follow standard safety procedures regarding natural disasters	7I		8I	6I
	Know the composition and structure of the Earth's atmosphere		6	7I,8D	
	Know the components of soil and other factors that influence soil texture, fertility, and resistance to erosion			6,7,8 D	

	Know that sedimentary, igneous and metamorphic rocks contain evidence of the minerals, temperatures, and forces that created them			7P	
	Know the processes involved in a rock cycle			7P	
	Know that the Earth's crust is divided in plates that move at extremely slow rates in response to movements in the mantle				6D,8D
	Know the successive layers of sedimentary rock and the fossils contained within them can be used to confirm the age, history, and changing of life forms of the Earth, and how this evidence is affected by folding, breaking, and uplifting of layers	7P			
	Identify the Earth as the third planet from the Sun, an average star, is the central and largest body in the solar system				6D,8P
	Understand that gravity is the force that keeps the planets and other bodies in orbit				6D,8P
	Model and explain the regular and predictable motions of objects in the solar system				6D,8P
	Communicate Newton's Laws of Gravitation		7P		
	Explain how the seasons result from variations in the Sun's energy and the length of the day due to the tilt of the Earth on its axis				6D,8P
	Understand that stars give off light and produce energy by nuclear fusion				8D
	Realize that light years and astronomical units are used to measure distances in space				8I
	Observe that through technology, humans continue to explore space				8D
	Know that the Earth is the only body in the solar system that appears to support life				6D,8P
	Know that many billions of galaxies in the universe and that incomprehensible distances separate them				8P
Science and Technology		Q1	Q2	Q3	Q4
	Explain how technology provides solutions for human problems, needs and dreams	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Identify the needs, attitudes, and values of society that influence the direction of technological development	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Understand that the frontiers in technological development provide many career opportunities	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Utilize technological tools in the study of science	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Discover that many different people in varied cultures have made significant contributions to the advancement of technology	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Use a wide variety of resources to identify examples of how scientific discoveries have resulted in technology	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
Science in Personal and Social Perspectives		Q1	Q2	Q3	Q4
	Illustrate the impact that science and technology have had, both on society, ecosystems, environments, and on the quality of life	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Show evidence of how science and technology are interdependent, using some examples from personally conducted investigations	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Design and develop process to create a product or solution	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D

	Analyze social issues based on whether human dignity is valued or harmed	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Model responsible behavior to family and community through service	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Use the church's social teachings as a lens to look at the moral and human dimensions of public issues	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Identify actions that would be considered abuses of human rights	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Display awareness of responsibility to others throughout the world	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Display individual and group actions to protect and preserve the environment	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Take an active role in programs and laws that support and help all forms of life	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Communicate that science provides explanations about the natural world	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Understand that science cannot answer all questions	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Understand that important personal and social decisions can be made based on scientific information and analysis of the benefits of the risks involved	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Understand that frontiers in scientific research provide many career opportunities	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Realize that many different people of varied cultures have made contributions that benefit both science and society	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Discover that every individual shares stewardship of the Earth, directly affecting the quality of life	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Understand through analysis that local decisions regarding the use of natural resources can have global impact	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Understand the causes, risks, and consequences of natural, biological, personal, and social hazards caused by technology	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Be able to evaluate the scientific evidence used in various media by analyzing this evidence for accuracy, logic, bias, relevance of the data, credibility of the sources	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Be able to present a scientific solution to a problem and participate in a consensus-building discussion to arrive at a group decision	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
History and Nature of Science		Q1	Q2	Q3	Q4
	Discuss the role work can play as a contribution to self and society	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Describe how scientific knowledge and concepts have changed over time in the various fields as new evidence is found	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Describe how scientific knowledge and concepts have changed over time in the various fields as new evidence is found	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Describe the major changes that have occurred in the sciences and identify the peoples, cultures, and conditions that led to these developments	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Explain how the general rules of science apply to the development and use of evidence in science investigations, in model making and in applications	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Describe the types of reasoning and evidence used outside to draw conclusions about the natural world	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Develop an understanding of the nature of science, how scientists formulate and test explanations by observations, experimentation, and models	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D

	Realize that it is normal for scientists to differ with one another about the interpretation of evidence or for them to draw different conclusions from the data	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D
	Explain the ways in which scientific knowledge is useful and also limited when applied to social issues	6,7,8 D	6,7,8 D	6,7,8 D	6,7,8 D

I=Introduced, D=Developing, P=Proficient