

**St Sebastian School  
Grades 6-8 Science  
Exit Expectations**

<b>Science as Inquiry</b>	<b>GRADE LEVEL</b>
• Identify questions that can be answered through scientific investigations	<b>6-8</b>
• Design and safely conduct a controlled experiment using the scientific method	<b>6-8</b>
• Use appropriate tools and techniques to gather, analyze, interpret, and present data	<b>6-8</b>
• Recognize and analyze alternative explanations and predictions and raise their own questions for further research	<b>6-8</b>
• Communicate scientific procedures and explanations, as well as the importance and implications of experimental results, to peers, teachers, and other adults	<b>6-8</b>
• Use inferences to help decide possible results of their investigations and use observations to check inference	<b>6-8</b>
• Use accepted scientific knowledge, models, and theories to explain their results and to raise further questions about their investigations	<b>6-8</b>

<b>Physical Science</b>	<b>GRADE LEVEL</b>
• Develop an understanding of the physical and chemical properties of matter	<b>6</b>
• 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	<b>6</b>
• Explain how models of atomic structure have changed over time including the strengths and weaknesses of each model	<b>6</b>
• Give a basic explanation of the Archimedes' Principle and Bernoulli's Principle and recognize their real-life applications	<b>6</b>
• Identify the Law of Conservation of Energy	<b>6</b>
• Model how all matter is composed of atoms, consisting of protons, neutrons, and electrons	<b>6</b>
• Realize that particles of matter are in constant motion, and when heated, the motion of the molecules increases, and they move farther apart	<b>6</b>
• Understand the role of electrons in bonding	<b>6</b>
• Understand that each element of the Periodic Table is identified by its atomic number, corresponding to the number of protons in the nucleus	<b>6</b>
• Understand the Periodic Table as an organizational system	<b>6</b>
• 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	<b>6</b>
• Know that electromagnetic forces exist within and between atoms	<b>6</b>
• Know that nuclear forces are much stronger than electromagnetic forces, which are vastly stronger than gravitational forces	<b>6</b>
• 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	<b>6</b>
• Understand general concepts related to gravitational force	<b>6</b>
• Know that the strength of the electric force between two charged objects is proportional to the charges	<b>6</b>
• Describe and investigate the properties of light, heat, gravity, magnetic fields, electrical fields and sound waves and their interactions with common objects	<b>6</b>
• Communicate that many devices have been designed to convert energy from one form to another	<b>6</b>
• Infer that as energy transformations occur, some energy escapes as heat, sound, or light	<b>6</b>
• Evaluate decisions about the future use of energy resources	<b>6</b>
• Show how machines can be used to do work more efficiently	<b>6</b>
• Investigate how work can be measured	<b>6</b>
• Understand that the Sun is a major source of energy for the Earth	<b>6</b>
• Show that light interacts with matter by transmission, absorption, or reflection	<b>6</b>
• Know how different materials respond to electric current	<b>6</b>
• Demonstrate how things that absorb light often transmit heat	<b>6</b>
• Show that light travels in straight lines unless reflected or refracted	<b>6</b>
• Demonstrate that light can be reflected or refracted with lenses	<b>6</b>
• Explain that photosynthesis is the process of using light to make food	<b>6</b>
• Know that electric currents can produce magnetic forces and magnets can produce electric currents	<b>6</b>
• Know that magnetic forces are very closely related to electric forces and can be thought of as different aspects of a single electromagnetic force	<b>6</b>
• Understand the interplay of electromagnetic forces is the basis for electric motors, generators, radio, television and other technologies	<b>6</b>
• Identify visible light as one component of the electromagnetic spectrum	<b>6</b>
• Show that light is essential for vision	<b>6</b>
• Describe how sound travels in waves	<b>6</b>
• Explain that sound waves have wavelength, frequency, and amplitude	<b>6</b>
• Observe and demonstrate that sound is affected by the medium through which it travels	<b>6</b>
• Show how the ear is a receptor for sound	<b>6</b>

<b>Life Science</b>	<b>GRADE LEVEL</b>
• Discover that living organisms carry on basic life processes	<b>7</b>
• Identify the levels of organization in living things: cells, tissues, organs, systems, and organisms	<b>7</b>
• Explain that a human organism has interactive systems	<b>7</b>
• Describe how diseases are the result of internal failure of body systems	<b>7</b>
• Know that animals and plants have a great variety of body plans and internal structures that serve specific functions for survival	<b>7</b>
• Know the evidence that supports the idea that there is unity among organisms despite the fact that some species look very different	<b>7</b>
• Know how organisms are classified into a hierarchy of groups and subgroups based on similarities that reflect their evolutionary relationships	<b>7</b>
• Know the structure and function of the different parts of a cell	<b>7</b>
• 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	<b>7</b>
• Know that organisms can react to internal and environmental stimuli through behavioral responses which may be determined by heredity or by past experience	<b>7</b>
• Describe photosynthesis	<b>7</b>
• Identify the various plant tissues and explain their functions	<b>7</b>
• Explain plant responses to the environment such as tropisms	<b>7</b>
• Explain the life cycle of a flowering plant	<b>7</b>
• Understand that sexual and asexual reproduction are necessary to the continuation of species	<b>7</b>
• Explain that in sexual reproduction, females produce eggs and males produce sperm, resulting in a new individual	<b>7</b>
• Communicate, within the context of Catholic teaching, that certain methods of birth control may prevent pregnancy and the spread of sexually transmitted diseases	<b>7</b>
• Describe how chromosomes are contained in both egg and sperm, and that genes found on chromosomes carry genetic instructions for the new individual	<b>7</b>
• Model how an inherited trait is determined by one or more genes and how a Punnett Square demonstrates the potential combination of traits	<b>7</b>
• Analyze how the development of a growing embryo and fetus takes place at a predictable rate and in an expected sequence during pregnancy	<b>7</b>
• Realize that both heredity and the environment contribute to the development of living things	<b>7</b>
• Know the chemical and structural properties of DNA and its role in specifying the characteristics of an organism	<b>7</b>
• Know ways in which genes may be altered and combined to create genetic variation within species	<b>7</b>
• Know that new inheritable characteristics can only result from new combinations of existing genes in an organism's sex cells: other changes in an organism cannot be passed on	<b>7</b>
• Know that mutations and new gene combinations may have positive, negative, or no effect on the organism	<b>7</b>
• Know features of human genetics	<b>7</b>
• 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	<b>7</b>
• Know ways in which species interact and depend on one another in an ecosystem	<b>7</b>
• Know factors that affect the number and types of organisms an ecosystem can support	<b>7</b>
• Know the relationships that exist among organisms in food chains and food webs	<b>7</b>
• Know that the fossil record through geological evidence documents the appearance, diversifications, and extinction of many life forms	<b>7</b>
• Know the basic ideas related to biological evolution	<b>7</b>
• Understand the concept of extinction and its importance in biological evolution	<b>7</b>
• Know that natural selection leads to organisms that are well suited for survival in particular environments, so that when an environment changes, some inherited characteristics become more or less advantageous or neutral, and chance alone can result in characteristics having no survival or reproductive value	<b>7</b>
• Know that the basic idea of evolution is that the Earth's present-day life forms evolved from earlier, distinctly different species	<b>7</b>
• Know the history of the origin and evolution of life on Earth	<b>7</b>
• Describe how ecosystems encompass the interactions among biotic and abiotic components in an environment	<b>7</b>

• Communicate that ecosystems are composed of a number of communities, each having characteristic plant and animals adapted to the environmental conditions of the area	<b>7</b>
• Show how energy moving through ecosystems can be described with food chains and food webs	<b>7</b>
• Explain that consumers receive energy from the food they eat	<b>7</b>
• Describe how food webs illustrate the flow of energy among producers, consumers, and decomposers	<b>7</b>
• Describe how water, light, and temperature are important abiotic factors for living things	<b>7</b>
• Understand that through the process of succession, communities change over time	<b>7</b>
• Relate that the factors affecting the size of a population are: the resources available, predation, climate, and disease	<b>7</b>
• Describe the eight biomes in terms of their distinct biotic and abiotic characteristics	<b>7</b>
• Explain how adaptations help organisms to survive in their particular habitat	<b>7</b>
• Describe how plants require sun, space, water, and soil nutrients	<b>7</b>
• Describe how plants are producers and are the only components of an ecosystem that transform the sun's energy into food	<b>7</b>

<b>Earth and Space Science</b>	<b>GRADE LEVEL</b>
• Know that the Earth is comprised of layers including a core, mantle, lithosphere, hydrosphere, and atmosphere	<b>8</b>
• Know the composition and structure of the Earth's atmosphere	<b>8</b>
• Know the components of soil and other factors that influence soil texture, fertility, and resistance to erosion	<b>8</b>
• Know that sedimentary, igneous, and metamorphic rocks contain evidence of the minerals, temperatures, and forces that created them	<b>8</b>
• Know the processes involved in the rock cycle	<b>8</b>
• Know that the Earth's crust is divided into plates that move at extremely slow rates in response to movements in the mantle	<b>8</b>
• Know how land forms are created through a combination of constructive and destructive forces	<b>8</b>
• 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	<b>8</b>
• Identify the Earth as the third planet from the Sun in a system that contains planets, moons, asteroids, and comets	<b>8</b>
• Realize that the Sun, an average star, is the central and largest body in the solar system	<b>8</b>
• Model and explain the regular and predictable motions of objects in the solar system	<b>8</b>
• Understand that gravity is the force that keeps the planets and other bodies in orbit	<b>8</b>
• Communicate Newton's Laws of Gravitation	<b>8</b>
• 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	<b>8</b>
• Understand that stars give off light and produce energy by nuclear fusion	<b>8</b>
• Realize that light years and astronomical units are used to measure distance in space	<b>8</b>
• Observe that through technology, humans continue to explore space	<b>8</b>
• Know that the Earth is the only body in the solar system that appears to support life	<b>8</b>
• Know that many billions of galaxies exist in the universe and that incomprehensible distances separate them	<b>8</b>
Identify the Earth's sources of water	<b>8</b>
Explain how water is recycled	<b>8</b>
Describe the physical and chemical properties of ocean water	<b>8</b>
Describe the features of the ocean floor and how sonar has mapped these features	<b>8</b>
Explain why ocean exploration is difficult	<b>8</b>
Describe what powers ocean currents and waves	<b>8</b>
Explain the causes of tides	<b>8</b>
Describe various ocean ecosystems	<b>8</b>
Explain our dependence on the ocean	<b>8</b>

<b>Science and Technology</b>	<b>GRADE LEVEL</b>
• Explain how technology provides solutions for human problems, needs, and dreams	<b>6-8</b>
• Understand that the frontiers in technological development provide many career opportunities	<b>7-8</b>
• Utilize technological tools in the study of science	<b>6-8</b>
• Discover that many different people in varied cultures have made significant contributions to the advancement of technology	<b>8</b>
• Use a wide variety of resources to identify examples of how scientific discoveries have resulted in new technology	<b>6-8</b>
• Illustrate the impact that science and technology have had, both good and bad, on society, ecosystems, environments, and on the quality of life	<b>7-8</b>
• Design and develop process to create a product or solution	<b>6</b>

<b>Science in Personal and Social Perspectives</b>	<b>GRADE LEVEL</b>
• Analyze social issues based on whether human dignity is valued or harmed (*1)	<b>7-8</b>
• Model responsible behavior to family and community through service (*2)	<b>6-8</b>
• Use the church's social teachings as a lens to look at the moral and human dimensions of public issues (*2)	<b>6-8</b>
• Identify actions that would be considered abuses of human rights (local, national, and international) (*3)	<b>6-8</b>
• Display and awareness of responsibility to others throughout the world (*6)	<b>6-8</b>
• Display individual and group actions to protect and preserve the environment (*2,7)	<b>6-8</b>
• Take an active role in programs and laws that support and help all forms of life (*7)	<b>6-8</b>
• Communicate that science provides explanations about the natural world	<b>6-8</b>
• Understand that science cannot answer all questions	<b>6-8</b>
• Understand that important personal and social decisions can be made based on scientific information and an analysis of the benefits and risks involved	<b>6-8</b>
• Understand that frontiers in scientific research provide many career opportunities	<b>6-8</b>
• Realize that many different people of varied cultures have made contributions that benefit both science and society	<b>6-8</b>
• Discover that every individual shares stewardship of the Earth, directly affecting the quality of life	<b>6-8</b>
• Understand through analysis that local decisions regarding the use or misuse of natural resources can have a global impact	<b>6-8</b>
• Understand the causes, risks, and consequences of natural, biological, personal, and social hazards caused by technology	<b>6-8</b>
• Be able to evaluate the scientific evidence used in various media by analyzing this evidence for accuracy, logic, bias, relevance of the data, and credibility of the sources	<b>6-8</b>
• Be able to present a scientific solution to a problem and participate in a consensus-building discussion to arrive at a group decision	<b>6-8</b>

<b>History and Nature of Science</b>	<b>GRADE LEVEL</b>
• Discuss the role work can play as a contribution to self and society (*5)	<b>6-8</b>
• Describe how scientific knowledge and concepts have changed over time in the various fields as new evidence is found	<b>6-8</b>
• Describe the major changes that have occurred in the sciences and identify the people, cultures, and conditions that led to these developments	<b>6-8</b>
• Explain how the general rules of science apply to the development and use of evidence in science investigations, in model making, and in applications	<b>6-8</b>
• Describe the types of reasoning and evidence used outside of science to draw conclusions about the natural world	<b>6-8</b>
• Realize the ways in which science is shared, results are checked and extended, and show how these processes change over time	<b>6-8</b>
• Explain the ways in which scientific knowledge is useful and also limited when applied to social issues	<b>6-8</b>
• Develop an understanding of the nature of science, how scientists formulate and test explanations by observation, experimentation, and models	<b>6-8</b>
• 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 same data	<b>6-8</b>
• Develop an understanding of science as a human endeavor with men and women of various social classes and diverse ethnic backgrounds working alone or in teams, communicating and relying on human abilities such as: reasoning, insight, energy, skill, creativity, honesty, tolerance of ambiguity, skepticism, and openness to new ideas	<b>6-8</b>