Diocese of Knoxville Science Curriculum Standards: Middle School, Sixth – Eighth Grade

SIXTH GRADE (6th)							
I. Physical Science **PS6.1 Matter and its Interactions** **Essential Question:**							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/ Content Notes**	**Date Taught**
PS6.1.A Atoms	**Understand that substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not. RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing. M.6 Reason abstractly and mathematically M.6 Model with mathematics			Matter Atom Substance Element Molecule Compound Mixture Heterogeneous mixture Homogeneous mixture Democritus	Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures , or computer representations showing different molecules with different types of atoms.	

PS6.1.A Physical and Chemical Properties	**Identify, contrast, and compare the physical and chemical properties of substances. Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Volume Solid Liquid Gas Physical Property Mass Density Melting point Boiling point Solubility Flammability Odor Chemical Property		
Physical Science **PS6.2: Motion and Stability: Forces and Interactions**							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/ Content Notes**	**Date Taught**
PS6.2.B Electric and Magnetic Forces	**Describe how electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.**			Electrically neutral Electric discharge Electrically charged Electric insulator Electric conductor Electric force Electric field		

	magnetic strengths involved and on the distances between the interacting objects.	RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.					
PS6.2.B Gravitational Forces	**Explain how gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass- e.g., Earth and the sun.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and			Gravity Inertia		

		demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.					
PS6.2.B Forces	**Determine how forces that act at a distance (electric and magnetic) can be explained by the fields that extend through space and can be mapped by their effect on a test object (a ball, a charged object or a magnet, respectively).**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Electric force Magnetic force Gravitational force		
PS6.3 Energy **Essential Question:**							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources**	**Catholic Identity**	**Academic Vocabulary &**	**Assessment/Content Notes**	**Date Taught**

					Scientists		
PS6.3.A Kinetic and Potential Energy	**Determine the relationship between kinetic and potential energy and transformations of other forms of energy.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Energy Potential Energy Kinetic Energy Mechanical energy Chemical energy Sound energy Thermal energy Electric energy Radiant energy Nuclear energy Law of Conservation of Energy Friction	Construct and interpret graphical displays of data to describe the relationship of kinetic energy to the mass of an object and to the speed of an object. Emphasis is on descriptive relationships between kinetic energy and mass separately form kinetic energy and speed. Examples could include riding a bicycle at different speeds, rolling different sizes of rocks downhill, and getting hit by a waffle ball versus a tennis ball.	
PS6.3.A Energy	**Perceive that motion energy is properly kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally,			Speed		

		quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing. M.RP.6. 2.1 Understand the concept of a ratio and use ratio language to describe a ratio language between two quantities.					
PS6.3.A Potential Energy	**Recognize that a system of objects may also contain stored (potential) energy, depending on their relative positions.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic	Demonstration using springs		Gravity Elastic potential	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. Emphasisis on relative amoutns of potential energy, not on calculations of potential energy. Examples of objects within systems interacting at varying distances could include: the Earth and either a roller coaster cart at varying positons on a	

		and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing. M.SP. 6.5.5 Summarize numerical data sets in relation to their context.				hill or objects at varying heights on shelves, changing the direction/orientation of a magnet, and a balloon with static electric charge being brought closer to a classmate's hair. Examples of models could include representations, diagrams, pictures, and written descriptions of systems.	
PS6.4 Waves and Their Application in Technology for Information Transfer							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources**	**Catholic Identity**	**Academic Vocabulary & Scientists**	**Assessment/Content Notes**	**Date Taught**
PS6.4.A Wave Patterns	**Describe the repeating pattern of a wavelength including the specific wavelength, frequency and amplitude.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.			Wave Transverse wave Crest Trough Amplitude Wavelength Frequency Medium	Use mathematical representations to describe a simple model for waves that include how the amplitude of a wave is related to the energy in a wave. Emphasis is on describing waves with both qualitative and quantitative thinking.	

		L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing. M.6 Reason abstractly and quantitatively. M.6.1 Model with mathematics M.RP.6. 2.1 Understand the concept of a ratio and use ratio language to describe a ratio language between two quantities					
PS6.4.A Sound Waves	**Demonstrate that a sound wave needs a medium through which it is transmitted.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation,			Longitudinal wave Parallel Rarefaction Compression	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. Emphasis is on both light and mechanical waves. Examples of models could include simulations, diagrams, drawings, and written descriptions.	

		and spelling when writing.					
PS6.4.B Light	**Understand that when light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Transmission Absorption Reflection		
PS6.4.B Light	**Determine that the path light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally,			Mirror Law of Reflection Angle of incidence Angle of reflection Refraction	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. Emphasis is on both light and mechanical waves. Examples of models could include simulations, diagrams,	

		quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.				drawings, and written descriptions. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. Emphasis is on both light and mechanical waves. Examples of models could include simulations, diagrams, drawings, and written descriptions.	
PS6.4.B Wave Model	**Determine how a wave model of light is useful for exploring brightness, color, and the frequency-dependent bending of light at a surface between media**.	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of			Electromagnetic spectrum Visible- light Prism		

		Standard English capitalization, punctuation, and spelling when writing.					

II. Life Science **LS6.1: From Molecules to Organisms: Structures and Processes**							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/ Scientists**	**Assessment/Content Notes**	**Date Taught**
LS6.1.C Energy and photosynthesis	**Describe how plants, algae, and many microorganisms use the energy from the light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis. These sugars can be used immediately or stored for later use.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.		The Universal Destination and the Private Ownership of Goods (7th Commandment) CCC 2402	Photosynthesis Glucose		

LS6.2 Life Science: Ecosystems: Interactions, Energy, and Dynamics							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources**	**Catholic Identity**	**Academic Vocabulary &**	**Assessment/Content Notes**	**Date Taught**

					Scientists		
LS6.2.A Ecosystems	**Determine how organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and nonliving factors.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.		Respect for the Dignity of Creation CCC 2415 - 2416	Ecosystem Abiotic factors Biotic factors Habitat Species Population Community Population density		
LS6.2.A Competition	**Understand that in any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey			Niche Competition Overpopulation -Symbiosis Mutualism Commensalism Parasitism Extinction		

		ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.					
LS6.2.A Limiting Factors	**Understand that growth of organisms and population increases are limited by access to resources.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Limiting factors Carrying capacity		
LS6.2.A Predation	**Determine how predatory interactions may reduce the number of organisms or eliminate whole populations of organisms.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as			Predation Predator Prey		

		well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.					
LS6.2.B Food webs	**Understand that food webs are models that demonstrate how matter and energy is transferred between producers, consumers and decomposers.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Producers Consumers Decomposers Food chain Food web		
III. Earth and Space Science							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**

ESS6.1.A Sun-Moon-Earth	**Can observe, describe, predict, and explain using models of then patterns of the apparent motion of the sun, the moon, and stars in the sky.**	SL.6.3A Demonstrate respect for views of others judging new ideas in light of Catholic doctrine. RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not**.** RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.		Profession of Faith CCC 32, 34	Geocentric model Heliocentric model Parallax Ptolemy Nicholas Copernicus		
ESS6.1.B Sun-Moon-Earth	**Explain eclipses of the sun and the moon, the seasons, tilt of the axis, and tides in relation to the sun-moon-earth system.**	W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.		Bishop Ignazio Danti	Rotation Revolution Gravity Summer Solstice Winter Solstice Autumnal (Fall) Equinox Vernal (Spring) Equinox Solar Eclipse Lunar Eclipse Neap Tide Spring Tide		

ESS6.1.A Galaxies	**Identify and describe the three types of galaxies and understand the Earth and the solar system are part of the Milky Way galaxy which is one of many galaxies in the universe**.	RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.		Fr. Robert Grosseteste Jesuit Jean-Felix Picard	Elliptical Galaxy Spiral Galaxy Irregular Galaxy		
ESS6.1.B Solar System	**Describe the composition of the solar system including the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.**	RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.		Catechesis on Creation CCC 282 - 289 Fr. Michal Heller	Terrestrial Planets Gas Giants Dwarf planets Natural satellite Asteroids Oort Cloud Kuiper Belt	W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.	
ESS6.1.B Creation	**Understand the Big Bang theory and other theories of origin in relation to our Catholic faith and the creation of the universe.**	RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing premises that are supported by reasons and evidence from conclusions that are not. SL.6.3A Demonstrate respect for views of others judging new ideas in light of Catholic doctrine. RI.6.7 Integrate information presented in different media or formats (e.g., visually, digitally, quantitatively) as		Father Georges Lemaitre	Big Bang Theory Local Group Super cluster Parsec		

		well as in words to develop a coherent understanding of a topic or issue. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.					
ESS6.2.A Earth systems	**Describe how Earth's processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior, the energy that flows and matter that cycles produce chemical and physical changes in Earth's materials** and living organisms.	W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Geosphere Atmosphere Hydrosphere Biosphere Mineral Rock Weathering Sediment Physical weathering Chemical weathering Erosion Deposition Mass wasting Glacier		
ESS6.2.B Earthquakes and Volcanoes	**Explain how landforms on Earth's surface are formed by plate tectonics and identify its relationship with earthquake and volcanic activity that occurs along plate boundaries.**	W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.			Earthquake Fault Magma Lava Volcano Mid-ocean ridge Sea-floor spreading Divergent boundaries Convergent boundaries Transform boundaries		
ESS6.2.C Water	**Explain how water continually cycles**	W.6.1.2 Support claim(s) with clear reasons and relevant			Water cycle Transpiration		

Cycle	**among land, ocean, and atmosphere via transpiration, evaporation, condensation, and crystallization and precipitation, as well as downhill flows on land**.	evidence, using credible sources and demonstrating an understanding of the topic or text. W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Evaporation Condensation Precipitation Runoff infliltration Crystallization by solution and evaporation Groundwater Water table		
ES6.2.C Weather	**Determine how the complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns.**	W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Weather Rain-Shadow effect Ocean Currents		
ESS6.3.A Resources	**Summarize how humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are**	W.6.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Nonrenewable resource Renewable resource Nuclear energy Reclamation Fossil fuels		

	distributed unevenly around the planet as a result of past geological processes.						
ESS6.3.D Renewable energy	**Identify and explain what renewable energy resources are available or under development to adjust for a world in which current non-renewable resources are becoming exhausted**.	W.6.1.2 Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. L.6.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing.			Solar energy Wind farm Hydroelectric power Geothermal energy Biomass energy		

IV. Engineering, Technology and Applications of Science

Code	Standards and Objectives	Literacy and Math Standards	Resources/ Activities	Catholic Identity	Academic Vocabulary/Scientists	Assessment/Content Notes	Date Taught
ETS6.1. A	**Understand that the more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible** solutions.				Variables Control Factors		
ETS6.1.B	**Recognize that a solution needs to be tested, and then modified based on the basis of the test**				Scientific Method Engineering Design Process		

	results, in order to improve it.						
ETS6.1.B	**Know that there are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.**						
ETS6.1.B	**Determine that sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors.**						
ETS6.1.B	**Understand that models of all kinds are important for testing solutions.**						
ETS6.1. C	**Recognize that although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of the characteristics may be incorporated into the new design.**				Engineers Design Process		
SEVENTH GRADE (7th)							
I. Physical Science							
Code	**Standards & Objectives**	**Literacy & Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**

PS7.1.A Matter and its Interactions: Substances	**Understand that each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.**	RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content.		Profession of Faith CCC 159	Volume Solid Liquid Gas Physical Property Mass Density Melting point Boiling point Solubility Flammability Odor Chemical property		
PS7.3.A Energy Temperature	**Recognize that temperature is a measure of the average kinetic energy of particles of matter. The relationship between the**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.			Temperature Solid Liquid Gas Plasma		

	temperature and the total energy of a system depends on the types, states, and amounts of matter present.	L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
PS7.3.A Energy Heat	**Understand that the term "heat" as used in everyday language refers both to thermal motion (the motion of atoms or molecules within a substance) and radiation (particularly infrared and light). In science, heat is only used for this second meaning; it refers to energy transferred when two objects or systems are at different temperatures.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.11 Expand the use of reference materials for gathering information and develop rubrics for evaluating validity of sources from web sources. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.	Insulated box Solar cooker Styrofoam cup		Energy transfer Conservation of energy		

PS7.3.B Motion energy	**Determine that when the motion energy of an object changes, there is inevitably some other change in energy at the same time.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
PS7.3.B Energy transfer	**Conclude that the amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. W.7.1.2 Support claim(s)					

		with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
PS7.3.B Energy transfer	**Recognize that energy is spontaneously transferred out of hotter regions or objects and into colder ones.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
PS7.3.D Cellular respiration	**Describe how cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2 Write			Flow of energy		

		informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content.					
PS7.3.D Energy **Photosynthesis**	**Explain how the chemical reaction by which plants produce complex food molecules (sugars) requires energy input (i.e. from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k, graphics (e.g., charts, table			Photosynthesis Chloroplast Jan Baptista van Helmont		

II. Life Science Grade 7							
Code	**Standards and Objectives**	**Literacy and Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**
LS7.1.A **Organisms**	**Understand that an organism may consist of one single cell or many different numbers and types of cells.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage			Cell Theory Prokaryotic Eukaryotic		

	Determine that all living things are made up of cells, which is the smallest unit that can be said to be alive.	when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.11 Expand the use of reference materials for gathering information and develop rubrics for evaluating validity of sources from web sources. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.			Matthias Schleiden Theodor Schwann Rudolph Virchow		
LS7.1.A **Reproduction**	**Explain that organisms reproduce in a variety of ways, either sexually or asexually, and transfer their genetic information to their offspring.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases			Asexual reproduction Sexual reproduction Genes Traits		

		taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k, graphics (e.g., charts, table					
LS7.1.A Cells	**Determine that within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as			Organelles Ribosome Mitochondria Chloroplast Vacuole Lysosome Endoplasmic reticulum Nucleus Cytoplasm Osmosis diffusion		

		well as inferences drawn from the text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.1.A Multicellular Organisms	**Model multicellular organisms, in which the body is a system of multiple interacting systems. Infer that these subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions**.	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k,			Organ system Tissue		

		graphics (e.g., charts, table					
LS7.1.B Adaptations	**Determine how variations through genetic evolution, including adaptations, provide a mechanism for evolution of plants and animals.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.1.B Adaptations	**Understand adaptations in both plants and animals and their impact on survival.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and			Variation Adaptation Natural selection Selective breeding Camouflage Mimicry		

		acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.1.C Cellular respiration	**Describe how cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting			Cellular respiration Lactic Acid fermentation Alcoholic fermentation Adenosine triphosphate (ATP)		

		(e.g., headings)k, graphics (e.g., charts, table					
LS7.2.A Ecosystems	**Create a model that demonstrates how in any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.11 Expand the use of reference materials for gathering information and develop rubrics for evaluating validity of sources from web sources. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.3.A Genes	**Understand that genes are located in the chromosomes of cells, with each chromosome**	L.7.1 Demonstrate command of the conventions of Standard English		Gregor Mendel	Alleles Base pairs Mutation Chromosome genes		

	pair containing two variants of each of many distinct genes. Describe how each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby changing traits.	grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content.					
LS7.3.B **Reproduction**	**Determine how in sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant			Meiosis Genes Dominant traits Recessive traits Codominance Genotype Phenotype Monohybrid cross Dihybrid cross Punnett square		

		evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.3.B Mutations	**Describe how in addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organisms.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k, graphics (e.g., charts, table			Mutation		
LS7.4.A Fossil record	**Portray how the collection of fossils and their placement in**	L.7.1 Demonstrate command of the conventions of		Nicholas Steno	Fossil Law of Superposition Fossil record		

	chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. Show how it documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.	Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.11 Expand the use of reference materials for gathering information and develop rubrics for evaluating validity of sources from web sources. W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content.			Radioactive dating		
LS7.4.A Fossil record	**Recognize that anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary					

	evolutionary descent.	and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.4.A Biological Change	**Discern how comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical					

		reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
LS7.4.B Natural selection	**Describe how natural selection leads to the predominance of certain traits in a population and the suppression of others**.	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content.					
LS7.4.B Artificial selection	**Explain how in artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding, One can choose desired parental traits determined by genes,**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade		The Fifth Commandment - Respect for the person and Scientific Research Catholic Teaching on			

	which are then passed on to offspring.	appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k, graphics (e.g., charts, table		artificial selection and the dignity of human life. CCC 2292 - 2295			
LS7.4.C Adaptation	**Evaluate how adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common, those that do not become less common. Thus, the distribution of traits in a population changes.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.1 Cite several		Profession of Faith - Faith and Understanding CCC 159			

		pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k, graphics (e.g., charts, table					
III. Earth and Space Science Grade 7							
Code	**Standards and Objectives**	**Literacy and Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**
ESS7.2.A Earth's place in the universe	**Determine how the planet's systems interactions, from microscopic to global, have shaped Earth's history and will determine its future.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding					

		to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
ESS7.2.B Plate tectonics	**Explain, based on investigations of rocks and fossils, how Earth's plates have moved great distances, collided, and spread apart.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.11 Expand the use of reference materials for gathering information and develop rubrics for evaluating validity of sources from web sources. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and			Pangaua Plate tectonics Alfred Wegener	Construct an explanation based on evidence for how geoscience processes have changed Earth's surfaces at varying times and spatial scales. Emphasis is placed on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges), or small (such as rapid landslides or microscopic geochemical reactions) and how many processes (such as earthquakes, meteor impacts and	

		information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings)k, graphics (e.g., charts, table				volcanoes) usually behave gradually but are punctuated by catastrophic events.	
ESS7.2.C Density	**Determine how variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
ESS7.2.D Weather and Climate	**Deconstruct how weather and climate are influenced by interactions involving sunlight, the ocean, the**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage					

	atmosphere, ice, landforms, and living things. Determine how these interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.	when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. W.7.1.2 Support claim(s) with logical reason and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.					
ESS7.2.D Weather	**Explain how these patterns are so complex that weather can only be predicted probabilistically.**	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and					

		acquired through reading and responding to text. W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content.					
ESS7.2.D Ocean current	**Describe how the ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents**.	L.7.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking. L.7.6 Use grade appropriate general academic vocabulary and domain specific words and phrases taught directly and acquired through reading and responding to text. W.7.2.1 Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting			Specific Heat		

		(e.g., headings)k, graphics (e.g., charts, table					
IV. Engineering, Technology and Applications of Science Grade 7							
Code	**Standards and Objectives**	**Literacy and Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**
ETS7.1. A	**Understand that the more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions.**			Life In Christ- Respect for the Person and Scientific Research CCC 2292 - 2295			
ETS7.1.B	**Recognize that a solution needs to be tested, and then modified based on the basis of the test results, in order to improve it**.						
ETS7.1.B	**Know that there are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.**						
ETS7.1.B	**Determine that sometimes parts of**						

	different solutions can be combined to create a solution that is better than any of its predecessors.						
ETS7.1.B	**Understand that models of all kinds are important for testing solutions.**						
ETS7.1.2.C	**Recognize that although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of the characteristics may be incorporated into the new design.**						
ETS7.1.C	**Recognize that although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of the characteristics may be incorporated into the new design,**						
EIGHTH GRADE (8th)							

I. Physical Science Grade 8							
Code	**Standards and Objectives**	**Literacy and Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**
PS8.1.A Gas and Liquids	**Understand that gas and liquids are made of molecules or inert atoms that are moving about relative to each other.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression. W.8.2.2 Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. W.8.8 Gather			Particle motion Particle force		

		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 form of citation.					
PS8.1.A Liquids	**Illustrate how in a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions for further research and investigation. L.8. 2 Demonstrate command of the conventions of standard English capitalization,					

		punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.1.A Solids	**Describe how solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when			Crystalline solids Amorphous solids		

		writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.1.A Change of State	**Explain how the changes in state that occur with variations in temperature or pressure can be described and predicted using these models of matter.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1 Write arguments to support claims with clear reasons and relevant evidence. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific			Charles' Law Boyle's Law		

		words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.1.B Chemistry	**Understand that substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. W.8.8 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 form of		Fr. Julius Nieuwland	Chemical change Physical change		

		citation.L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.1.B Chemistry	**Explain how the total number of each type of atom is conserved, and thus the mass does not change.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1 Write arguments to support claims with clear reasons and relevant evidence. L.8. 2 Demonstrate command of the conventions of standard English capitalization,			Law of Conservation of Matter		

		punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.1.B Chemical Reactions	**Determine that some chemical reactions release energy, while others store energy.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when			Exothermic reaction Endothermic reaction		

		writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.2.A Newton's Third Law	**Describe how for any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.			Newton's Third Law Sir Isaac Newton		

		L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.2.A Newton's Laws	**Describe how the motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and			Newton's Second Law		

		use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.2.A Forces	**Understand that all positions of objects and directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.8 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 form of citation.L.8. 2 Demonstrate command of the conventions of standard English					

		capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.3.C Newton's Law	**Recognize that when two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2.2 Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.			Newton's Third Law		

		L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.4.B Wave model	**Create a wave model of light that demonstrates brightness, color, and the frequency-dependent bending of light at a surface between media.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions for further research and investigation. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when					

		writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.4.B Light Properties	**Design and conduct an experiment that demonstrates lights properties, including its reflection, absorption, or transmission through an object, the path it travels, and its ability to travel through space (making it impossible for it to be a matter wave, like sound or water waves).**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions for further research and investigation. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when					

		writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
PS8.4.C	**Determine why and how digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately					

		grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
II. Life Science Grade 8							
Code	**Standards and Objectives**	**Literacy and Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**
LS8.1.B Adaptations	**Understand the role adaptations play in both plants and animals in relation to the theory of evolution.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.8 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 form of citation.L.8. 2 Demonstrate			Naturalist Variation Mimicry Adaptation Natural selection Charles Darwin		

		command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
LS8.1.D	**Describe how each receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain, resulting in immediate behaviors or memories.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content. L.8. 2 Demonstrate command of the			Neuron Reflex		

		conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
LS8.2.A	**Explain how mutually beneficial interactions, may become so interdependent that each organism requires the other for survival.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1 Write arguments to support claims with clear reasons and relevant evidence. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.			Competitive Predatory Mutually Beneficial		

		L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
LS8.2.B	**Determine how food webs demonstrate that transfers of matter into and out of the physical environment occur at every level. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately			Food chain Food Web Energy Pyramid		

		grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
LS8.2.C Ecosystems	**Describe how ecosystems are dynamic in nature, their characteristics can vary over time. Determine how disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate					

		general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
LS8.2.C Biodiversity	**Evaluate how biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2.2 Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary		Encyclical Letter Laudato Si On Care of Our Common Home.			

		knowledge when considering a word or phrase important to comprehension or expression.					
LS8.2.D Biodiversity	**Determine how changes in biodiversity can influence humans' resources, such as food, energy and medicines, as well as ecosystem services that humans rely on- for example, water purification and recycling.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word					

		or phrase important to comprehension or expression.					
LS8.3.B	**Evaluate how variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2.2 Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					

III. Earth and Space Science							
Code	**Standards and Objectives**	**Literacy and Math Standards**	**Resources/ Activities**	**Catholic Identity**	**Academic Vocabulary/Scientists**	**Assessment/Content Notes**	**Date Taught**
ESS8.1.C Fossil Record	**Determine how the geological time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					

ESS8.1.C Tectonics	**Explain how tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor trenches.**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.1 Write arguments to support claims with clear reasons and relevant evidence. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.			Sea floor spreading Mid-ocean ridge		
ESS8.3.B	**Determine how mapping the history of natural hazards in a region, combined with an understanding of**	RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says					

	related geographic forces can help forecast the locations and likelihoods of future events.	explicitly as well as inferences drawn from the text. W.8.1.2 Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
ESS8.3.C	**Evaluate how human activities have significantly altered the biosphere sometimes damaging or destroying natural habitats and causing**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn					

	the extinction of other species. Changes to Earth's environments can have different impacts (negative and positive) for different living things.	from the text. W.8.2.2 Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
ESS8.3.C	**Describe how typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.2 Write informative/explanatory texts to examine					

	otherwise.	a topic and convey ideas, concepts, and information through the selection, organization and analysis of relevant content. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					
ESS8.D	**Elaborate on how human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing**	RI.8.3E Cite a wide range of evidence throughout the text to support analysis of what the text says explicitly as well as inferences drawn from the text. W.8.7 Conduct short research projects to answer a question (including a self-					

	human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.	generated question), drawing on several sources and generating additional related, focused questions for further research and investigation. L.8. 2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. L.8.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.					

IV. Engineering, Technology and Applications of Science

Code	Standards and Objectives	Literacy and Math Standards	Resources/ Activities	Catholic Identity	Academic Vocabulary/Scientists	Assessment/Content Notes	Date Taught
ETS8.1. A	**Understand that the more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will**			Roger Bacon St. Albert the Great			

	be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions.						
ETS8.1.B	**Recognize that a solution needs to be tested, and then modified based on the basis of the test results, in order to improve it.**						
ETS8.1.B	**Know that there are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.**						
ETS8.1.B	**Determine that sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors.**						
ETS8.1.B	**Understand that models of all kinds are important for testing solutions.**						
ETS8.1. C	**Recognize that although one design may not perform the best across all tests, identifying the**						

	characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of the characteristics may be incorporated into the new design.						
ETS8.1.C	**Recognize that although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of the characteristics may be incorporated into the new design,**				Scientific method		