Grade 3 Science Standards

Domain: Forces and Interactions			
Code:	**Strand:**	**Rating**	**Completed**
3.PS1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Supporting	
3.PS 1	Define and describe the forces of gravity and friction.	Priority	
3.PS1.2	Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Supporting	
3.PS1.3	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	Supporting	
3.PS2	Investigate the characteristics of magnets (e.g., opposite poles attract, like poles repel, the force between two magnets poles depends on the distance between them).	Priority	
3.PS2.1	State cause and effect relationships between magnets and circuitry.	Supporting	
3.PS2.2	Identify and explain a simple design problem that can be solved by applying scientific ideas about magnets.*	Supporting	

Catholic Identity

- If students are using technology/devices, they should demonstrate Catholic responsibility through proper use of digital communication and apply digital citizenship.
- Place physical obstacles between a magnet and a metal object. Explain that the greater the object (or obstacle/sin) the more difficult it is for us to feel the draw of God. Talk about obstacles or sins that can keep us from feeling God's invitation for love.

Science and Engineering Practices

Asking Questions and Defining Problems Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.

- Ask questions that can be investigated based on patterns such as cause and effect relationships. (3.PS2.3)
- Define a simple problem that can be solved through the development of a new or

Disciplinary Ideas

PS2.A: Forces and Motion

- Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3.PS2.1)
- The patterns of an object's motion in various situations can

Crosscutting Concepts

Patterns

- Patterns of change can be used to make predictions. (3.PS2.2)

Cause and Effect

- Cause and effect relationships are routinely identified. (3.PS2.1)
- Cause and effect relationships are routinely identified, tested, and used to explain change. (3.PS2.3)

Connections to Engineering, Technology, and Applications of Science

improved object or tool. (3.PS2.4) **Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3.PS2.1) • Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3.PS2.2) - ***Connections to Nature of Science*** **Science Knowledge is Based on Empirical Evidence** • Science findings are based on recognizing patterns. (3.PS2.2) • Scientific Investigations Use a Variety of Methods **Science investigations use a variety of methods, tools, and techniques. (3.PS2.1)**	be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3.PS2.2) **PS2.B: Types of Interactions** • Objects in contact exert forces on each other. (3.PS2.1) • Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3.PS2.3),(3.PS2.4)	Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3.PS2.4)

Domain: Weather and Climate			
Code:	**Strand:**	**Rating**	**Completed**
3.ESS3.1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Supporting	
3.ESS3.2	Interpret the symbols on a weather map or chart to identify the following: temperatures, fronts, precipitation.	Supporting	
3.ESS3	Obtain and combine information to describe climates in different regions of the world.	Priority	
3.ESS4	Compare weather conditions and various conditions (e.g., regions of Arizona, various U.S. cities, coastal vs. interior geographical regions).	Priority	
3.ESS4.1	Defend the merit of a design solution that reduces the impacts of a weather-related hazard.	Supporting	

Catholic Identity

- If students are using technology/devices, they should demonstrate Catholic responsibility through proper use of digital communication and apply digital citizenship.
- Evaluate the consequences of environmental occurrences that happen either rapidly or over a long period of time and how we are called in solidarity to help those involved in these events.
- Reference the Corporal and Spiritual Works of Mercy to enhance discussion about the impact of severe weather conditions on living things throughout the world.

Science and Engineering Practices

Analyzing and Interpreting Data
Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3.ESS2.1)

Engaging in Argument from Evidence
Engaging in argument from evidence in 3– 5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Make a claim about the

Disciplinary Ideas

ESS2.D: Weather and Climate

- Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3.ESS2.1)
- Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3.ESS2.2)

ESS3.B: Natural Hazards

- A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3.ESS3.1)

(Note: This Disciplinary Core Idea is also addressed by 4.ESS3.2.)

Crosscutting Concepts

Patterns

- Patterns of change can be used to make predictions. (3.ESS2.1),(3.ESS2.2)

Cause and Effect

- Cause and effect relationships are routinely identified, tested, and used to explain change. (3.ESS3.1)

Connections to Engineering, Technology, and Applications of Science

- Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3.ESS3.1)

merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3.ESS3.1) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. • Obtain and combine information from books and other reliable media to • explain phenomena. (3.ESS2.2)		--- ***Connections to Nature of Science*** **Science is a Human Endeavor** • Science affects everyday life. (3.ESS3.1)

Domain: Engineering Design			
Code:	**Strand:**	**Rating**	**Completed**
3.5.ETS1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	Priority	
3.5.ETS1.2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem	Supporting	
3.5.ETS1.3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved	Supporting	

Catholic Identity

- Share materials and work together in small groups, listen to the ideas of others. Be respectful and treat others as you wish to be treated.
- Use the God given gift of intellect to be resourceful and use simple tools tomake tasks easier.
- Consider the pastoral as well as the practical nature of the problems and solutions we address.

Science and Engineering Practices

Asking Questions and Defining Problems

Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.

- Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5.ETS1.1)

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of

Disciplinary Ideas

ETS1.A: Defining and Delimiting Engineering Problems

- Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5.ETS1.1)

ETS1.B: Developing Possible Solutions

- Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5.ETS1.2)
- At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
- Tests are often designed to

Crosscutting Concepts

Influence of Science, Engineering, and Technology on Society and the Natural World

- People's needs and wants change over time, as do their demands for new and improved technologies. (3-5.ETS1.1)
- Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5.ETS1.2)

trials considered. (3-5.ETS1.3) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5.ETS1.2)	identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5.ETS1.3) **ETS1.C: Optimizing the Design Solution** • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5.ETS1.3)	

Domain: Interdependent Relationships in Ecosystems			
Code:	**Strand:**	**Rating**	**Completed**
3.LS2.1.	Construct an argument that some animals form groups that help members survive	Priority	
3.LS4.1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	Supporting	
3.S6.C1.DPO4	Describe fossils as a record of past forms.	Priority	
3.S6.C1.DPO5	Describe how fossils are formed.	Supporting	
3.LS4.3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	Priority	
3.S4.C3.DPO1	Identify the living and nonliving components of an ecosystem.	Supporting	
3.S4.C3.DPO2	Describe the components of an ecosystem.	Priority	
3.S4.C3.DPO3	Examine an ecosystem to identify microscopic and macroscopic organisms.	Supporting	
3.S4.C3.DPO1.1	Describe ways various resources (e.g., air, water, plants , animals, soil) are utilized to meet the needs of population.	Priority	
3.S4.C3.DPO3.1	Analyze the effect that limited resources (e.g., natural gas, minerals) may have on an environment.	Supporting	
3.LS4.4	Defend the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	Supporting	
3.S4.C3.DPO6	Describe how plants and animals cause changes in their environment	Supporting	
3.S4.C3.DPO7	Describe how environmental factors (e.g., soil composition, range of temperature, quantity and quality of light) in the ecosystem may affect a member organism's ability to grow, reproduce, and thrive.	Priority	

Catholic Identity

- If students are using technology/devices, they should demonstrate Catholic responsibility through proper use of digital communication and apply digital citizenship.
- Understand that all plants and animals are God's creation and require us to care for it.
- Recognize we are stewards of all God's creation and that we were made in His image and likeness.
- Identify causes and effect of hunger in the world.
- Describe the development of different technologies (medicine, communication, entertainment, transportation) in response to resources, needs and values.
- Find out how students in your school can help families affected by a natural disaster. Plan a way to help in a small way. Propose a solution, resource, or product that addresses a specific human, animal, or habitat need.

Science and Engineering Practices

Analyzing and Interpreting Data
Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3.LS4.1)

Engaging in Argument from Evidence
Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed worlds.

- Construct an argument with evidence, data, and/or a model. (3.LS2.1)
- Construct an argument with evidence. (3.LS4.3)
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

Disciplinary Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3.LS4.4)

LS2.D: Social Interactions and Group Behavior

- Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.

LS4.A: Evidence of Common Ancestry and Diversity

- Some kinds of plants and animals that once lived on Earth are no longer found anywhere.
- Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3.LS4.1)

LS4.C: Adaptation

- For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

LS4.D: Biodiversity and Humans

- Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3.LS4.4)

Crosscutting Concepts

Cause and Effect

- Cause and effect relationships are routinely identified and used to explain change. (3.LS2.1),(3.LS4.3)
- Scale, Proportion, and Quantity Observable phenomena exist from very short to very long time periods. (3.LS4.1)

Systems and System Models

- A system can be described in terms of its components and their interactions. (3.LS4.4)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- Knowledge of relevant scientific concepts and research findings is important in engineering. (3.LS4.4)

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural System

- Science assumes consistent patterns in natural systems. (3.LS4.1)

Domain: Inheritance and Variation of Traits: Life Cycles and Traits			
Code:	**Strand:**	**Rating**	**Completed**
3.LS1.1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	Priority	
3.S4.C2.DPO1	Compare life cycles of various plants (e.g., conifers, flowering plants, ferns).	Supporting	
3.S4.C2.DPO2	Explain how growth and decay are part of the plant life cycle.	Supporting	
3.LS3.1	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	Priority	
3.S4.C2.DPO3	Define the terms heredity and genes.	Supporting	
3.S4.C2.DPO4	Distinguish between physical characteristics which are and are not inherited.	Supporting	
3.LS3.2	Use evidence to support the explanation that traits can be influenced by the environment.	Supporting	
3.LS4.2	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.	Priority	

Catholic Identity

- If students are using technology/devices, they should demonstrate Catholic responsibility through proper use of digital communication and apply digital citizenship.
- Recognize that we all have special gifts and talents from God.
- Emphasize the unique trait of having a soul that is specific to humans.
- Recognize respect for all living things as God's creations.

Science and Engineering Practices

Developing and Using Models
Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Develop models to describe phenomena (3.LS1.1)

Analyzing and Interpreting Data
Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

Disciplinary Ideas

LS1.B: Growth and Development of Organisms
Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3.LS1.1)

LS3.A: Inheritance of Traits

- Many characteristics of organisms are inherited from their parents. (3.LS3.1)
- Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3.LS3.2)

Crosscutting Concepts

Patterns

- Similarities and differences in patterns can be used to sort and classify natural phenomena. (3.LS3.1)
- Patterns of change can be used to make predictions. (3.LS1.1)

Cause and Effect

- Cause and effect relationships are routinely identified and used to explain change. (3.LS3.2),(3.LS4.2)

Connections to Engineering, Technology, and Applications of Science

• Analyze and interpret data to make sense of phenomena using logical reasoning. (3.LS3.1) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Use evidence (e.g., observations, patterns) to support an explanation. (3.LS3.2) • Use evidence (e.g., observations, patterns) to construct an explanation. (3.LS4.2) - **Connections to Nature of Science** Science Knowledge is Based on Empirical Evidence	**LS3.B: Variation of Traits** • Different organisms vary in how they look and function because they have different inherited information. (3.LS3.1) • The environment also affects the traits that an organism develops. (3.LS3.2) **LS4.B: Natural Selection** • Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3.LS4.2)spin axis is fixed in direction over the short- term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS.ESS1. 1) • The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (MS.ESS1.2)	• Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3.ESS3.1) ---------- ***Connections to Nature of Science*** **Science is a Human Endeavor** • Science affects everyday life. (3.ESS3.1)