

Science Curriculum

Second Grade

VISION OF STUDENT

The performance expectations in second grade help students formulate answers to questions such as: “How does land change and what are some things that cause it to change? What are the different kinds of land and bodies of water? How are materials similar and different from one another, and how do the properties of the materials relate to their use? What do plants need to grow? How many types of living things live in a place?” Second grade performance expectations include PS1, LS2, LS4, ESS1, ESS2, and ETS1 and Disciplinary Core Ideas from the NRC Framework. Students are expected to develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students are also expected to compare the diversity of life in different habitats. An understanding of observable properties of materials is developed by students at this level through analysis and classification of different materials. Students are able to apply their understanding of the idea that wind and water can change the shape of the land to compare design solutions to slow or prevent such change. Students are able to use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concepts of patterns; cause and effect; energy and matter; structure and function; stability and change; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the second grade performance expectations, students are expected to demonstrate grade appropriate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas. They will explore the basic properties of Earth and ways we can conserve our natural resources while displaying stewardship for all that God created.

Next Generation Science Standards

The Archdiocese of Santa Fe Standard 1: Investigation and Inquiry Process:

Students will be exposed to various tools and use these tools in the world of science. They will also be introduced to and participate in the Scientific Inquiry Process while being actively involved in science concepts through “hands-on” guided labs and experiences.

Critical for Mastery in Grade 2

LEARNING OUTCOMES (What students will be able to do, know, understand and value)	SAMPLE ASSESSMENTS/STRATEGIES (What evidence will demonstrate that students have achieved the Learning Outcome)	BEST PRACTICES
1. Formulate relevant questions about the properties of objects, organisms, and events in the environment.	<ul style="list-style-type: none"> • Develop questions about color and temperature (i.e., dark clothing, upholstery) 	
2. Write predictions of an investigation.	<ul style="list-style-type: none"> • Predict the relationship between color and temperature. 	
3. Demonstrate safe behavior and appropriate procedures in all science inquiry.	<ul style="list-style-type: none"> • Develop safety rules for thermometers, etc. • Utilize a digital thermometer. 	
4. Use simple tools such as rulers, magnifiers, thermometers and scales in guided investigations.	<ul style="list-style-type: none"> • Use thermometer to measure temperatures of various colored papers. 	
5. Participate in guided investigation in both large and small group formats.	<ul style="list-style-type: none"> • Assign each small group a different color paper and thermometer. 	
6. Record data from guided investigations in a lab book/journal, notebook, log and/or chart paper.	<ul style="list-style-type: none"> • Record temperature in lab notebook and transfer to classroom graph. 	
7. Construct reasonable explanations and/or conclusions of observations obtained.	<ul style="list-style-type: none"> • Analyze classroom graph to determine which color absorbed most heat. 	
8. Compare the final results to what was predicted.	<ul style="list-style-type: none"> • Compare findings of experiment with predictions. 	
9. Communicate the results and conclusions of an investigation with the group.	<ul style="list-style-type: none"> • Discuss in whole group results of small group findings. 	

The Archdiocese of Santa Fe Standard 2: Life Science

Students will explore, investigate, identify and distinguish interdependent relationships in ecosystems.

Critical for Mastery in Grade 2

LEARNING OUTCOMES (What students will be able to do, know, understand and value)	SAMPLE ASSESSMENTS/STRATEGIES (What evidence will demonstrate that students have achieved the Learning Outcome)	BEST PRACTICES
A. Interdependent Relationships in Ecosystems:		
1. Develop and conduct investigation to determine if sunlight and water are necessary for plant growth.	<ul style="list-style-type: none"> ● Grow plants testing one variable at a time (i.e., sunlight and water). 	
2. Identify various plant parts and their functions.	<ul style="list-style-type: none"> ● Make scientific drawing of plant parts including labeling. 	
3. Identify animal structures that serve different functions (e.g., sensory, defense, locomotion).	<ul style="list-style-type: none"> ● Create a chart of animal structures identifying their functions. 	
4. Design a simple model that imitates an animal dispensing seed or pollinating plants.	<ul style="list-style-type: none"> ● Student's models can include diagrams, dioramas, physical replies, dramatizations, etc. 	
5. Compare and contrast the life cycles of various living organisms.	<ul style="list-style-type: none"> ● Order the steps of an animal's life cycle. ● View internet videos relating to various animal life cycles. 	
6. Observe plants and animals comparing the diversity of life in different habitats.	<ul style="list-style-type: none"> ● Students identify animals that belong in a particular habitat. (i.e., make habitat poster) 	
7. Identify ways to care for our ecosystem including recycling programs, etc.	<ul style="list-style-type: none"> ● Discuss what materials are recyclable and start class/school recycling programs. 	
8. Identify relationships between the roles of science, technology, and Catholic ethics in the global community.	<ul style="list-style-type: none"> ● The St. Francis Pledge - I/We Pledge to: <ul style="list-style-type: none"> ○ PRAY and reflect on the duty to care for God's Creation and protect the poor and vulnerable. ○ LEARN about and educate others on the causes and moral dimensions of climate change. 	

	<ul style="list-style-type: none"> ○ ASSESS how we-as individuals and in our families, parishes and other affiliations-contribute to climate change by our own energy use, consumption, waste, etc. ○ ACT to change our choices and behaviors to reduce the ways we contribute to climate change. ○ ADVOCATE for Catholic principles and priorities in climate change discussions and decisions, especially as they impact those who are poor and vulnerable. 	
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The Archdiocese of Santa Fe Standard 3: Physical Science

Students will observe, recognize and develop a primary understanding of the properties and structure of matter and chemical change.

Critical for Mastery in Grade 2

LEARNING OUTCOMES (What students will be able to do, know, understand and value)	SAMPLE ASSESSMENTS/STRATEGIES (What evidence will demonstrate that students have achieved the Learning Outcome)	BEST PRACTICES
A. Structure and Properties of Matter:		
1. Develop and conduct an investigation to describe/classify various materials by their observable properties.	<ul style="list-style-type: none"> ● Classify objects by color, texture, hardness, flexibility. 	
2. Review data from the testing of different materials to determine appropriate materials for intended purpose.	<ul style="list-style-type: none"> ● Use different materials (i.e., toothpicks, wood to build bridges) testing for strength and flexibility. *See engineering 	
3. Observe how an object consisting of small pieces can be deconstructed and made into something new.	<ul style="list-style-type: none"> ● Construct a new structure using blocks, building bricks or other small objects (i.e., Take a “Lego” man, disassemble and create a T. V. 	

4. Demonstrate that magnets attract and repel.	<ul style="list-style-type: none"> Observe and illustrate polarity with appropriate vocabulary. 	
B. Develop an argument with supporting evidence showing that some changes caused by heating or cooling can be reversed and some cannot.	<ul style="list-style-type: none"> Work stations (with adult supervision) demonstrating reversible (i.e., water...ice) and non reversible (i.e., freezing a plant leaf). 	

The Archdiocese of Santa Fe Standard 4: Earth and Space Science

Students will explore the processes that shape the earth. They will find evidence that shows how events on the earth can occur quickly or slowly. Students will develop a model to show earths land and bodies of water (both solid and liquid).

Critical for Mastery in Grade 2

LEARNING OUTCOMES (What students will be able to do, know, understand and value)	SAMPLE ASSESSMENTS/STRATEGIES (What evidence will demonstrate that students have achieved the Learning Outcome)	BEST PRACTICES
1. Develop an evidence based account that Earth events can occur quickly or slowly.	<ul style="list-style-type: none"> Through use of media observe evidence that shows accounts of Earth events that can happen very quickly (i.e., volcanic explosions, earth quake) or happen very slowly (i.e., erosion of rocks, “Grand Canyon”). 	
2. Understand that the elements of wind and water can change the shape of land.	<ul style="list-style-type: none"> Through use of text and media see how wind and water alter the shape of land. Brainstorm and compare multiple solutions designed to slowdown or prevent deterioration of land from water and wind. (i.e., design forms of barriers that would hold back water or block away wind or use shrubs, grass, or trees to hold back land). 	

The Archdiocese of Santa Fe Standard 5: Engineering

Students will create and construct models where they utilize decision making skills while building with different types of materials.

Critical for Mastery in Grade 2

LEARNING OUTCOMES (What students will be able to do, know, understand and value)	SAMPLE ASSESSMENTS/STRATEGIES (What evidence will demonstrate that students have achieved the Learning Outcome)	BEST PRACTICES
A. Building Materials:		
1. Construct an item using various types of building materials.	<ul style="list-style-type: none"> Observe various bridges and compare building materials. 	
2. List characteristics of building materials.	<ul style="list-style-type: none"> Compare and contrast physical characteristics of two materials. 	
B. Construction of Model(s):		
1. Use one or more types of building materials to design a model to solve a problem.	<ul style="list-style-type: none"> Design and construct bridges (popsicle sticks and toothpicks) to hold weight. 	
C. Discussion and Analysis:		
1. Determine whether their construct worked or not. <ul style="list-style-type: none"> Was the problem solved? Were the materials adequate? 	<ul style="list-style-type: none"> Test bridges with weights, observe patterns and material strength. Evaluate results. Record results of the test by using a video camera. 	