

## Diocese of Green Bay

### SCIENCE

Through science, the study of the natural world, students learn through curiosity, observation and experimentation about the world God created for us. Students have the privilege of learning about God's creation from a Catholic perspective leading to responsible stewardship and ultimate respect and love for the Creator. The study of God's creation and how we interact in the world emphasizes the dignity and sacredness of life in all forms. Students learn to take responsibility for their actions and to be good stewards of God's creation.

#### Committee

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## References

*Laudato Si'* Care for our Common Home

[http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco\\_20150524\\_enciclica-laudato-si.html](http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html)

[Catechism of the Catholic Church](#)

Baglow, C.T. (2012). Faith, Science and Reason: Theology on the Cutting Edge. Midwest Theological Forum. Woodridge, IL

Archdiocese of Milwaukee, Wisconsin

Diocese of Madison, Wisconsin

Diocese of La Crosse, Wisconsin

Diocese of Columbus, Ohio

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. National Research Council of the National Academies. The National Academies Press. Washington, D.C. (2012)

Next Generation Science Standards

## Science as Inquiry (SI)

Students build an understanding, through observation and experimentation, the foundations of science, the study of the structure and behavior of the physical and natural world God created using scientific inquiry.

Kindergarten	First Grade	Second Grade
<ol style="list-style-type: none"><li>1. Observe and ask questions about the natural world God Created</li><li>2. Plan and conduct simple investigations</li><li>3. Employ simple equipment and tools to gather data and extend the senses</li><li>4. Use appropriate mathematics with data to construct reasonable explanations</li><li>5. Communicate about observations, investigations and explanations</li><li>6. Review and ask questions about the observations and explanations of others</li><li>7. Apply Catholic values to the development and application of science concepts</li></ol>	<ol style="list-style-type: none"><li>1. Observe and ask questions about the natural world God created</li><li>2. Plan and conduct simple investigations</li><li>3. Employ simple equipment and tools to gather data and extend the senses</li><li>4. Use appropriate mathematics with data to construct reasonable explanations</li><li>5. Communicate about observations, investigations and explanations</li><li>6. Review and ask questions about the observations and explanations of others</li><li>7. Apply Catholic values to the development and application of science concepts</li></ol>	<ol style="list-style-type: none"><li>1. Observe and ask questions about the natural world God created</li><li>2. Plan and conduct simple investigations</li><li>3. Employ simple equipment and tools to gather data and extend the senses</li><li>4. Use appropriate mathematics with data to construct reasonable explanations</li><li>5. Communicate about observations, investigations and explanations</li><li>6. Review and ask questions about the observations and explanations of others</li><li>7. Apply Catholic values to the development and application of science concepts</li></ol>

## Life and Environmental Science (LES)

Students demonstrate an understanding of the characteristics and structure of all God’s creation: living things, the processes of life, and how God designed living things to interact with one another and the environment in which they live.

Genesis 1.11 – 2.25 – Central theme: The world and all creation began with God.

Kindergarten	First Grade	Second Grade
<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Molecules to Organisms: Structures and Processes</b> <ol style="list-style-type: none"> <li>a. Identify what God has created, living and non-living (plants, animals, humans, rocks, rainbows, water...) and their characteristics</li> <li>b. Classify different types of animal groupings</li> <li>c. Observe and describe patterns of what plants and animals (including humans) need to survive</li> <li>d. Describe the relationship between the needs of different plants and animals (including humans) and where they live</li> <li>e. Explain how plants and animals (including humans) can change their environment to meet their basic needs</li> <li>f. Use observations (first hand or media) to describe patterns in the natural world in order to answer scientific questions</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>From molecules to Organisms: Structures and Processes</b> <ol style="list-style-type: none"> <li>a. Understand God created all organisms with external parts that help them survive</li> <li>b. Observe that different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find and take in food, water and air</li> <li>c. Identify parts of a plant (roots, stems, leaves, flowers, fruits) that help them survive</li> <li>d. Design a solution to a human problem by mimicking how plants and animal external parts help them survive</li> <li>e. Determine patterns in behavior of parents and offspring that help offspring survive</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Ecosystems: Interactions, Energy, and Dynamics</b> <ol style="list-style-type: none"> <li>a. Plan and conduct investigations to determine levels of sunlight and water plants need to grow and survive</li> <li>b. Understand plants depend on animals for pollination or to move their seeds around</li> <li>c. Develop a model to mimic function of an animal in dispersing seeds or pollinating plants</li> <li>d. Explain that all living things reproduce</li> <li>e. Observe plants and animals to compare diversity of life in different habitats</li> </ol> </li> </ol>

	<p><b>2. Heredity: Inheritance and Variation of Traits</b></p> <ul style="list-style-type: none"><li>a. Observe and record how young plants and animals are similar to but not exactly like their parents</li><li>b. Illustrate that animals and plants have life cycles</li><li>c. Identify the life cycle of an insect</li><li>d. Identify the parts of a plant and its life cycle</li><li>e. Explain that plants and animals, including humans, have adaptations needed for growth and survival</li></ul>	
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# Physical Science

Students understand and demonstrate that properties of materials and energy change, can be observed, measured, and protected.

Kindergarten	First Grade	Second Grade
<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Motion and Stability: Forces and Interactions</b> <ol style="list-style-type: none"> <li>a. Investigate strengths and directions of pushes and pulls of an object</li> <li>b. Analyze design solutions intended to change the speed and direction of an object using a push or pull</li> <li>c. Understand when objects touch or collide, they push on one another and can change motion</li> <li>d. With guidance, plan and conduct and explain an investigation demonstrating pushes and pulls on the motion of an object</li> <li>e. Investigate how observable properties of matter can change (sand mixed with water, melted ice or snow...)</li> </ol> </li> <li>2. <b>Energy and its effects</b> <ol style="list-style-type: none"> <li>a. Observe and determine the effect of sunlight on the Earth’s surface</li> <li>b. With guidance, plan, design, and build a structure that will</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Waves and their applications in technologies for information transfer</b> <ol style="list-style-type: none"> <li>a. Investigate how sound can make matter vibrate and vibrating matter can make sound</li> <li>b. Observe how objects can be seen if light is available to illuminate them or if they give off their own light</li> <li>c. Investigate to determine the effect of placement of objects in the path of a beam of light</li> <li>d. Identify materials that allow light to pass through them, allow only some light through and block light and create a dark shadow on any surface beyond them</li> <li>e. Understand mirrors can be used to redirect light beam</li> <li>f. Design or build a device that uses light or sound to solve the problem of communicating over a distance</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Matter and its interactions</b> <ol style="list-style-type: none"> <li>a. Plan and conduct investigations to describe and classify materials by their observable properties. (color, texture, hardness and flexibility)</li> <li>b. Classify matter by its observable properties; solid, liquid</li> <li>c. Explain why different properties are suited to different purposes</li> <li>d. Analyze data from testing properties of materials and determine best materials for given purpose.</li> <li>e. Observe and record how objects made of small pieces can be disassembled and made into new objects.</li> <li>f. Construct an evidence based argument to support changes caused by heating or cooling materials are sometimes reversible and sometimes not.</li> <li>g. Understand that every human-made product is designed by</li> </ol> </li> </ol>

demonstrate the power of the sun's energy		applying some knowledge of the natural world created by God and is built using material God gave humans
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# Earth and Space Science

Students demonstrate an understanding of the characteristics and structures of earth and space.

Genesis 1.1 – 2.25 – Central theme: The universe and all creation began with God.

Kindergarten	First Grade	Second Grade
<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Earth's Systems</b> <ol style="list-style-type: none"> <li>a. Weather and Climate patterns – describe, record and share observations of local weather conditions to describe patterns over time (i.e., morning to afternoon, day to day)</li> <li>b. Understand plants and animals, including humans, can change their environment to meet their needs</li> <li>c. Identify the impact of changes plants, animals and humans make on the environment (i.e., tree roots lift or break concrete, squirrels dig holes...)</li> </ol> </li> <li>2. <b>Earth and Human Activity</b> <ol style="list-style-type: none"> <li>a. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live</li> <li>b. Understand living things need water,</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Earth's Place in the Universe</b> <ol style="list-style-type: none"> <li>a. Observe the predictable patterns of the sun, moon, and stars</li> <li>b. Predict, observe and describe seasonal patterns of sunrise and sunset</li> <li>c. Understand that Earth is surrounded by air called atmosphere</li> <li>d. Demonstrate that air exists and takes up space</li> <li>e. Discover that air temperature varies with time and place</li> <li>f. Measure air temperature using a thermometer</li> <li>g. Know that Earth materials consist of solid rocks, soils, liquid water, and the gasses of the atmosphere and have different properties</li> </ol> </li> <li>2. <b>Earth and Human Activity</b> <ol style="list-style-type: none"> <li>a. Realize that the Earth is a planet</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Earth's Place in the Universe</b> <ol style="list-style-type: none"> <li>a. Use information from several sources to explain and provide evidence that Earth events can occur quickly or slowly (i.e., volcanic explosions, earthquakes, erosion of rocks)</li> </ol> </li> <li>2. <b>Earth's Systems</b> <ol style="list-style-type: none"> <li>a. Explain how wind and water can change the shape of the land</li> <li>b. Compare multiple solutions designed to slow or prevent erosion by wind or water</li> <li>c. Explain how maps show where things are located. One can map the shapes and kinds of land and water in an area.</li> <li>d. Develop a model to represent the shapes and kinds of land and bodies of water in an area.</li> </ol> </li> </ol>



<p>air and resources from the land, and they live in places that have the things they need</p> <ul style="list-style-type: none"> <li>c. Understand humans use natural resources for everything they do</li> <li>d. Identify natural resources humans use</li> <li>e. Ask questions to obtain information about severe weather forecasting and its effects on human behavior</li> <li>f. Communicate solutions to reduce human impact on the environment</li> </ul>	<p>that supports life</p>	<ul style="list-style-type: none"> <li>e. Obtain information to determine sources of water on Earth and that it can be solid or liquid.</li> </ul>
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Engineering and Technology Science (ETS)		
Kindergarten	First Grade	Second Grade
<ol style="list-style-type: none"> <li>1. Ask questions, make observations, and gathers information about a simple problem that can be solved through the development of a new or improved object or tool.</li> <li>2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</li> <li>3. Analyze data from testing two objects designed to solve the same problem to compare strengths and weaknesses of how each performs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ask questions, make observations, and gathers information about a simple problem that can be solved through the development of a new or improved object or tool.</li> <li>2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</li> <li>8. Analyze data from testing two objects designed to solve the same problem to compare strengths and weaknesses of how each performs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ask questions, make observations, and gathers information about a simple problem that can be solved through the development of a new or improved object or tool.</li> <li>2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</li> <li>3. Analyze data from testing two objects designed to solve the same problem to compare strengths and weaknesses of how each performs.</li> </ol>

## Health Science

Students understand that the human body and its systems are a gift from God and all systems work intricately together. Internal and external factors influence growth and development and the structure and function of human body systems.

Through scripture we know that God values our bodies and we should value our body and the bodies of others.

1 Corinthians 6:19-20 – Do you not know that your body is a temple of the holy Spirit within you, whom you have from God and that you are not your own? For you have been purchased at a price. Therefore glorify God in your body.

1 Corinthians 12:27 - Now you are the body of Christ, and each one of you is a part of it.

1 Corinthians 12:12-26 – One body, many parts

Psalms 100:3 - Know that the Lord is God, he made us, we belong to him.

Kindergarten	First Grade	Second Grade
<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Human Body</b> <ol style="list-style-type: none"> <li>a. Observe that human bodies have similarities and differences</li> <li>b. Investigate how our ears allow us to hear sound differences, quality, and direction</li> <li>c. Investigate how our eyes provide us with our sense of sight</li> <li>d. Investigate how our skin enables us to use our sense of touch</li> </ol> </li> <li>2. <b>Health Promotion</b></li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Human Body</b> <ol style="list-style-type: none"> <li>a. Identify and describe major body parts</li> <li>b. Identify types of teeth and their functions</li> <li>c. Describe how to properly care for teeth</li> <li>d. Identify foods that contribute to strong bones and teeth.</li> </ol> </li> <li>2. <b>Health Promotion</b> <ol style="list-style-type: none"> <li>a. Identify personal health practices (exercise, good nutrition, proper hygiene)</li> </ol> </li> </ol>	<p><b>Students who demonstrate understanding:</b></p> <ol style="list-style-type: none"> <li>1. <b>Human Body</b> <ol style="list-style-type: none"> <li>a. Observe and describe how human body parts have functions that are adapted for special tasks</li> </ol> </li> <li>2. <b>Health Promotion</b> <ol style="list-style-type: none"> <li>a. Describe healthy lifestyle, habits, and proper hygiene</li> <li>b. Describe how germs can cause illness</li> <li>c. Identify practices that prevent and control the spread of diseases</li> </ol> </li> </ol>

<ul style="list-style-type: none"><li>a. Germs can be helpful or harmful</li><li>b. Bad germs can be spread through, touch, cough and sneeze</li><li>c. Identify personal health practices that help prevent the spread of harmful germs</li><li>d. Understand good nutrition and exercise help one stay healthy</li><li>e. Identify the people and professions who provide care when needed</li></ul>	<ul style="list-style-type: none"><li>b. Identify one's responsibilities for health and safety</li><li>c. Describe the role of nutrition in a healthy lifestyle</li><li>d. Identify the people and professions who help people stay well</li></ul>	<ul style="list-style-type: none"><li>d. Identify foods that contribute to good nutrition</li><li>e. Identify the people and professions who help people stay well</li></ul>
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