



# Diocese of Greensburg Curriculum Science Grade 5

Unit	Standards	Content	Skills
<p><b>Space Systems</b></p>	<p><b>CCSS: ELA &amp; Literacy in History/Social Studies, Science, &amp; Technical Subjects K-5</b> <b>CCSS: Grade 5</b></p> <hr/> <p><b>Reading: Informational Text</b> <b>Key Ideas and Details</b> <b>1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</b></p> <p>RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p><b>2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</b></p> <p>RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.</p> <p><b>3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.</b></p> <p>RI.5.3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.</p> <hr/> <p><b>CCSS: Mathematics</b> <b>CCSS: Grade 5</b></p> <hr/> <p><b>Number &amp; Operations in Base Ten</b> <b>5.NBT.A. Understand the place value system.</b></p>	<ul style="list-style-type: none"> <li>• Orbit of Earth around the sun</li> <li>• Orbit of moon around the Earth</li> <li>• Rotation of Earth on its axis</li> <li>• Sun is a star</li> <li>• Measure distances in the universe</li> <li>• Different positions of sun, earth, moon, and stars</li> <li>• Observable patterns (day/night, daily changes, in shadows, seasons, moon phases)</li> </ul>	<p><b>The students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and nights, and the seasonal appearance of some stars in the night sky.</li> <li>• Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.</li> <li>• Support an argument that the gravitational force exerted by Earth on objects is directed using a downward force.</li> <li>• Develop a model representing phases of the moon.</li> <li>• Develop a model to show the relationship between the position of the Earth, moon and sun.</li> <li>• Use evidence to support:             <ul style="list-style-type: none"> <li>○ that the Earth’s rotation around the sun causes the shadows to change in size</li> <li>○ how the Sun, our closest star, is the central and largest body in our solar system</li> <li>○ the fact that the sun appears brighter because of its proximity to Earth compared to other stars</li> <li>○ how the position of the earth, moon, and sun cause “moon phases”</li> </ul> </li> </ul>

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	<p>5.NBT.A.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.</p> <p>5.NBT.A.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.</p> <p>5.NBT.A.3. Read, write, and compare decimals to thousandths.</p> <p><b>NGSS: Science Performance Expectations (2013)</b>  <b>NGSS: Grade 5</b></p> <hr/> <p><b>5.Space Systems: Stars and the Solar System Performance Expectations</b></p> <p>5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.</p> <p>5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.</p> <p><b>3-5.Engineering Design Performance Expectations</b></p> <p>3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p>3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well</p>		<ul style="list-style-type: none"> <li>○ how the Earth's rotation around the sun causes shadows to change</li> <li>○ the use of graphical displays to organize data pertaining to daily and seasonal changes</li> </ul>

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	<p>each is likely to meet the criteria and constraints of the problem.</p> <p>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.</p> <p><b>NGSS: Disciplinary Core Ideas</b>  <b>NGSS: Grade 5</b></p> <hr/> <p><b>ESS1: Earth’s Place in the Universe</b>  <b>ESS1.A: The Universe and Its Stars</b></p> <p>The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)</p> <p><b>ESS1.B: Earth and the Solar System</b></p> <p>The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2)</p> <p><b>PS2: Motion and Stability: Forces and Interactions</b>  <b>PS2.B: Types of Interactions</b></p> <p>The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center. (5-PS2-1)</p>		
<p><b>Earth's Systems</b></p>	<p><b>CCSS: ELA &amp; Literacy in History/Social Studies, Science, &amp; Technical Subjects K-5</b>  <b>CCSS: Grade 5</b></p> <hr/> <p><b>Reading: Informational Text</b>  <b>Key Ideas and Details</b>  <b>1. Read closely to determine what the text says</b></p>	<ul style="list-style-type: none"> <li>• Energy from the sun heats the Earth unevenly, causing air movements, resulting in changing weather patterns.</li> </ul>	<p><b>The students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.</li> </ul>

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	<p><b>explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</b></p> <p>RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p><b>2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</b></p> <p>RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.</p> <p><b>3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.</b></p> <p>RI.5.3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.</p> <p><b>CCSS: Mathematics</b> <b>CCSS: Grade 5</b></p> <hr/> <p><b>Number &amp; Operations—Fractions</b> <b>5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</b></p> <p>5.NF.B.7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.</p> <p><b>Measurement &amp; Data</b> <b>5.MD.A. Convert like measurement units within a given measurement system.</b></p> <p>5.MD.A.1. Convert among different-sized standard measurement units within a given measurement</p>	<ul style="list-style-type: none"> <li>• The hydrosphere consists of both fresh and salt water.</li> <li>• The atmosphere consists of various levels.</li> <li>• The biosphere is all living things including humans.</li> <li>• Nearly all of Earth’s available water is found in the ocean.</li> <li>• Most fresh water is found within glaciers, ice caps or groundwater; only a small fraction is found in streams, lakes, wetlands, and the atmosphere.</li> <li>• Patterns of weather.</li> <li>• Systems interact in multiple ways to affect Earth’s surface materials and processes.</li> <li>• The geosphere is consists of solid and molten rock, soil, and sediments.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a model, using a specific given example of a phenomenon, to describe* ways that the geosphere, biosphere, hydrosphere, and/or atmosphere interact.</li> <li>• Use graphs of the relative amounts of total salt water and total fresh water in each of the reservoirs to describe the following: <ul style="list-style-type: none"> <li>○ the majority of water on Earth is found in the oceans</li> <li>○ the amount of the Earth’s fresh water stored in glaciers or groundwater</li> <li>○ The amount of fresh water found in lakes, rivers, wetlands, and the atmosphere</li> </ul> </li> <li>• Design a solution to offset the negative effects on the environment as a result of human activities.</li> <li>• Explain the importance of each system.</li> <li>• Explain how human interaction can make a positive or negative impact on each system.</li> </ul>

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	<p>system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</p> <p><b>5.MD.B. Represent and interpret data.</b></p> <p>5.MD.B.2. Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Use operations on fractions for this grade to solve problems involving information presented in line plots.</p> <hr/> <p><b>NGSS: Science Performance Expectations (2013)</b> <b>NGSS: Grade 5</b></p> <p><b>5.Earth's Systems</b> <b>Performance Expectations</b></p> <p>5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.</p> <p>5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.</p> <p>5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.</p> <hr/> <p><b>NGSS: Disciplinary Core Ideas</b> <b>NGSS: Grade 5</b></p> <p><b>ESS2: Earth's Systems</b> <b>ESS2.A: Earth Materials and Systems</b></p> <p>Earth's major systems are the geosphere(solid and molten rock, soil, and sediments),the hydrosphere (water and ice), the atmosphere (air), and the biosphere (livingthings, including humans). These</p>		

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	<p>systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)</p> <p><b>ESS2.C: The Roles of Water in Earth's Surface Processes</b></p> <p>Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)</p> <p><b>ESS3: Earth and Human Activity</b>  <b>ESS3.C: Human Impacts on Earth Systems</b></p> <p>Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)</p>		
<p><b>Matter and Its Interactions</b></p>	<p><b>CCSS: ELA &amp; Literacy in History/Social Studies, Science, &amp; Technical Subjects K-5</b>  <b>CCSS: Grade 5</b></p> <hr/> <p><b>Reading: Informational Text</b>  <b>Key Ideas and Details</b>  <b>1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</b></p> <p>RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.</p>	<ul style="list-style-type: none"> <li>• Anything that has measurable mass and volume is made of matter.</li> <li>• Properties of matter (including mass, volume, inertia, weight) help scientists identify and classify matter.</li> <li>• Density is the ratio between mass and volume.</li> <li>• There are differences between mass, weight, volume, and density.</li> <li>• Physical changes of matter do not form new</li> </ul>	<p><b>The students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Develop a model to describe that matter is made of particles too small to be seen</li> <li>• Measure and graph quantities to provide evidence that regardless of the type of change that occurs (when heating, cooling, or mixing substances), the total weight of matter is conserved.</li> <li>• Use qualitative and quantitative measurements to identify materials based on their properties.</li> </ul>

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	<p><b>2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</b></p> <p>RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.</p> <p><b>3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.</b></p> <p>RI.5.3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.</p> <p><b>Writing</b>  <b>Text Types and Purposes</b>  <b>1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</b></p> <p>W.5.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</p> <p>W.5.1a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose.</p> <p>W.5.1b. Provide logically ordered reasons that are supported by facts and details.</p> <p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 5</b></p> <hr/> <p><b>Measurement &amp; Data</b>  <b>5.MD.A. Convert like measurement units within a given measurement system.</b></p> <p>5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these</p>	<p>substances and often can be reversed.</p> <ul style="list-style-type: none"> <li>• Changes of state (boiling, evaporation, freezing, etc.) are a physical change.</li> <li>• Moving particles make up matter and the speed of these particles determines physical state.</li> <li>• Changes of state are accompanied by a change in energy.</li> <li>• Chemical changes of matter form new substances with new properties and often cannot be reversed.</li> <li>• The total number of atoms does not change in a chemical reaction or physical change and thus mass is conserved.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct an investigation to determine whether the mixing of two or more substances results in new substance.</li> <li>• Identify matter by its specific characteristics.</li> <li>• Measure the volume of a liquid using a graduated cylinder.</li> <li>• Calculate the volume of a cube or rectangular prism.</li> <li>• Measure the mass of an object using a triple beam balance.</li> <li>• Use a thermometer to measure temperature.</li> <li>• Use basic units of metric measurements using correct abbreviations.</li> <li>• Calculate density with correct units.</li> </ul>

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	<p>conversions in solving multi-step, real world problems.</p> <p><b>5.MD.C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</b></p> <p>5.MD.C.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p> <p>5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p> <p>5.MD.C.5b. Apply the formulas <math>V = l \times w \times h</math> and <math>V = b \times h</math> for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.</p> <p><b>NGSS: Disciplinary Core Ideas</b>  <b>NGSS: Grade 5</b></p> <hr/> <p><b>PS1: Matter and Its Interactions</b>  <b>PS1.A: Structure and Properties of Matter</b></p> <p>Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects. (5-PS1-1)</p> <p>The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)</p> <p>Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or</p>		

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	<p>explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)</p> <p><b>PS1.B: Chemical Reactions</b></p> <p>When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)</p> <p>No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary:Mass and weight are not distinguished at this grade level.) (5-PS1-2)</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Matter and Energy in Organisms and Ecosystems</b></p>	<p><b>CCSS: ELA &amp; Literacy in History/Social Studies, Science, &amp; Technical Subjects K-5</b></p> <p><b>CCSS: Grade 5</b></p> <p><b>Reading: Informational Text</b></p> <p><b>Key Ideas and Details</b></p> <p><b>1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</b></p> <p>RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p><b>2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</b></p> <p>RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.</p> <p><b>3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.</b></p>	<ul style="list-style-type: none"> <li>• How the relationship between the components include the movement of matter within an ecosystem.</li> <li>• How the interactions of plants, animals, decomposers, and the environment that allow the species to meet their needs.</li> <li>• How changing one aspect of the ecosystem affects other aspects of the ecosystem.</li> </ul>	<p><b>The students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment</li> <li>• Identify and support the idea that plants acquire the materials they need for growth chiefly from air and water.</li> <li>• Use models to describe a phenomenon that includes the idea that energy in animals' food was once energy from the sun.</li> <li>• Develop a model to describe a phenomenon that includes the movement of matter within an ecosystem.</li> </ul>

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	<p>RI.5.3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.</p> <p><b>Writing</b>  <b>2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.</b></p> <p>W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 5</b></p> <hr/> <p><b>Number &amp; Operations—Fractions</b>  <b>5.NF.A. Use equivalent fractions as a strategy to add and subtract fractions.</b></p> <p>5.NF.A.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.</p> <p><b>5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</b></p> <p>5.NF.B.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</p> <p><b>Measurement &amp; Data</b>  <b>5.MD.A. Convert like measurement units within a given measurement system.</b></p>		

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	<p>5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</p> <p><b>NGSS: Disciplinary Core Ideas</b>  <b>NGSS: Grade 5</b></p> <hr/> <p><b>LS1: From Molecules to Organisms: Structures and Processes</b>  <b>LS1.C: Organization for Matter and Energy Flow in Organisms</b></p> <p>Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)</p> <p>Plants acquire their material for growth chiefly from air and water. (5-LS1-1)</p> <p><b>LS2: Ecosystems: Interactions, Energy, and Dynamics</b>  <b>LS2.A: Interdependent Relationships in Ecosystems</b></p> <p>The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)</p> <p><b>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</b></p>		

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	<p>Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)</p> <p><b>PS3: Energy</b>  <b>PS3.D: Energy in Chemical Processes and Everyday Life</b></p> <p>The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1)</p>		

