

- Required to be taught to meet state content standards in science
- ✓ Information introduced for the next grade level
- + Brookings School district additional requirements

### Fourth Grade Nature of Science

**Indicator 1: Understand the nature and origin of scientific knowledge.**

*Note: These skills should be taught and practiced in grade-level study of Physical, Life, and Earth/Space Science although mastery is not expected at these grade levels.*

Bloom's Taxonomy Level	Standard	Supporting Skills and Examples	Assessments	Resources
		<ul style="list-style-type: none"> <li>✓ Identify people who have revolutionized scientific thinking.               <ul style="list-style-type: none"> <li>• Samuel Morse</li> <li>• Thomas Edison</li> <li>• Benjamin Franklin</li> </ul> </li> <li>✓ Describe science as the process of asking and answering questions and comparing the results to what is already known.</li> <li>✓ Example: KWL Chart</li> </ul>		

**Indicator 2: Apply the skills necessary to conduct scientific investigations.**

*Note: These skills should be taught and practiced in grade-level study of Physical, Life, and Earth/Space Science although mastery is not expected at these grade levels.*

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
		<p>✓ Use investigations in science to acquire knowledge.</p> <p>Example: Investigate the effect of surface area and air temperature on evaporation.</p> <ul style="list-style-type: none"> <li>• Make observations.</li> <li>• Make predictions.</li> <li>• Ask questions.</li> <li>• Form a simple hypothesis.</li> <li>• Plan investigations.</li> <li>• Use appropriate scientific equipment and proper safety procedures in all investigations.</li> <li>• Use appropriate metric measurement to collect, record, chart, and/or graph data.</li> </ul>		

		<ul style="list-style-type: none"> <li>• Interpret data.</li> <li>• Communicate results.</li> </ul> <p>✓ Recognize the effect of manipulated variables on the outcomes of events.</p>		
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**Fourth Grade Nature of Science  
Performance Descriptors**

**Note: At the fourth grade level, the teachers need to focus on observing and collecting information about the progress students are making related to the checkmark statements. The skills and concepts addressed in this goal are to be included across the other goals. Appropriate scientific instruction should provide students the opportunity to actively engage in scientific investigations.**

**Fourth Grade Physical Science**

**Indicator 1: Describe structures and properties of, and changes in, matter.**

<b>Bloom's Taxonomy Level</b>	<b>Standards</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Comprehension)	<b>4.P.1.1. Students are able to describe observable physical changes and properties in matter.</b>	<p>Examples: solubility (matter dissolving into water) and density (floating and sinking)</p> <p>Define matter.</p> <p>Describe physical properties (color, shape, size, mass)</p>		

(Analysis)	<b>4.P.1.2. Students are able to explain how some physical properties remain the same as the mass is changed.</b>	Example: A block of salt will taste the same as a grain of salt, wood-wood shavings.  Define mass.  Describe chemical changes Example: mixing baking soda and vinegar.		
(Comprehension)	<b>4.P.1.3. Students are able to differentiate between the states of matter caused by changes in temperature using water.</b>	Example: from ice to water to water vapor  Define states of matter.  Predict/Associate changes of state caused by temperature changes.		

**Indicator 2: Analyze forces, their forms, and their effects on motions.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Application)	<b>4.P.2.1. Students are able to demonstrate how forces act over a distance.</b>	Example: magnetism +Define force.		

**Indicator 3: Analyze interactions of energy and matter.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Knowledge)	<b>4.P.3.1. Students are able to identify materials as being conductors or insulators of electricity.</b>	<p>Examples: aluminum, wood, paper, plastic, glass, rubber band, iron, and steel.</p> <p>Define a conductor and an insulator.</p> <p>Identify items in a set as being conductors or insulators.</p>		
(Application)	<b>4.P.3.2. Students are able to construct and define a simple circuit.</b>	<p>Examples: open and closed circuits</p> <ul style="list-style-type: none"> <li>• Give examples of simple circuits.</li> </ul> <p>Define parallel and series circuits.</p> <p>Construct parallel and series circuits.</p> <p>Static electricity and current electricity.</p>		
(Application)	<b>4.P.3.3. Students are able to use magnets, electromagnets, magnetic fields, and compasses to explore magnetic energy.</b>	<ul style="list-style-type: none"> <li>• Define magnets and their properties.</li> </ul> <p>+Explain that electrical circuits can produce magnetic force.</p> <ul style="list-style-type: none"> <li>✓ Demonstrate polarity using magnets and dry cells.</li> </ul>		

**Fourth Grade Physical Science  
Performance Descriptors**

<b>Advanced</b>	<b>Fourth grade students performing at the advanced level:</b> <ul style="list-style-type: none"><li>• create water vapor;</li><li>• design an electromagnet;</li><li>• design an invention which conducts electricity;</li><li>• demonstrate the difference between parallel and series circuits.</li></ul>
<b>Proficient</b>	<b>Fourth grade students performing at the proficient level:</b> <ul style="list-style-type: none"><li>• describe what happens to water when it is heated or cooled;</li><li>• use magnets to define and demonstrate force at varying distances;</li><li>• sort materials by their conductivity;</li><li>• construct and define a simple electrical circuit.</li></ul>
<b>Basic</b>	<b>Fourth grade students performing at the basic level:</b> <ul style="list-style-type: none"><li>• identify the three states of water;</li><li>• explore the capabilities of magnets;</li><li>• construct a simple electrical circuit.</li></ul>

## Fourth Grade Life Science

**Indicator 1: Understand the fundamental structures, functions, classifications, and mechanisms found in living things.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Knowledge)	<b>4.L.1.1. Students are able to identify the basic systems (digestive, skeletal, muscular, nervous, respiratory, and circulatory) and major organs.</b>	Examples: circulatory-heart, blood vessels, blood <ul style="list-style-type: none"> <li>✓ Primary function in the human body.</li> </ul> + Label major organs on diagrams of body systems. +List organs (from word bank) under the correct body system		
(Comprehension)	<b>☐4.L.1.2. Students are able to differentiate between vertebrates and invertebrates, and classify the five groups of vertebrates (mammal, reptile, amphibian, bird, and fish) based on characteristics.</b>	Examples: reproduction (live birth or eggs), body covering, respiration <ul style="list-style-type: none"> <li>• Define vertebrate and invertebrates.</li> </ul> +Distinguish between 5 classes of vertebrates based on physical characteristics		

**Indicator 2: Analyze various patterns and products of natural and induced biological change.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Knowledge)	<b>4.L.2.1. Students are able to identify behavioral and structural adaptations that allow a plant or animal to survive in a particular environment.</b>	Examples: hibernation and migration <ul style="list-style-type: none"> <li>• Explain environments and adaptations.</li> </ul> +Define habitats and niches. +Describe adaptations animals have to survive in a given environment.		
(Analysis)	<b>4.L.2.2. Students are able to explain how a size of a population is dependent upon the available resources within its community.</b>	Know community resources. <ul style="list-style-type: none"> <li>• Define population.</li> </ul> +Explain how a population's size depends upon resources available.  Connect animal populations to name of group (i.e. insect - colonies, fish - schools)		



**Indicator 3: Analyze how organisms are linked to one another and the environment.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Comprehension)	<b>4.L.3.1. Students are able to describe the flow of energy through food chains and webs.</b>	Understand food chains and food webs.		

**Fourth Grade Life Science Performance Descriptors**

<b>Advanced</b>	<p><b>Fourth grade students performing at the advanced level:</b></p> <ul style="list-style-type: none"> <li>• create a visual representation of the body including the skeletal, muscular, digestive, nervous, respiratory, and circulatory systems;</li> <li>• differentiate between groups of vertebrates based on their characteristics;</li> <li>• construct a food web/chain.</li> </ul>
<b>Proficient</b>	<p><b>Fourth grade students performing at the proficient level:</b></p> <ul style="list-style-type: none"> <li>• name the basic body systems (digestive, skeletal, muscular, nervous, respiratory, and circulatory,) and explain their primary functions;</li> <li>• differentiate between vertebrates and invertebrates, and name five groups of vertebrates (mammal, amphibian, bird, fish, and reptile);</li> <li>• describe adaptations that allow plants and animals to survive;</li> <li>• describe the flow of energy through food chains and webs.</li> </ul>
<b>Basic</b>	<p><b>Fourth grade students performing at the basic level:</b></p> <ul style="list-style-type: none"> <li>• identify the skeletal system and describe one basic function;</li> <li>• name an animal without a backbone;</li> <li>• recognize plants and animals can change to survive;</li> <li>• identify the parts of a basic food chain.</li> </ul>

## Fourth Grade Earth/Space Science

### Indicator 1: Analyze the various structures and processes of the Earth system.

Bloom's Taxonomy Level	Standard	Supporting Skills and Examples	Assessments	Resources
(Comprehension)	<p><b>4.E.1.1. Students are able to describe the basic stages of the water cycle.</b></p> <p><b>Example:</b> model of water cycle</p> <ul style="list-style-type: none"> <li>• Define evaporation, condensation, and precipitation.</li> </ul>			
(Comprehension)	<p><b>4.E.1.2. Students are able to describe how weather conditions and phenomena occur and can be predicted.</b></p>	<ul style="list-style-type: none"> <li>• Identify the positive and negative impacts of weather on the environment.</li> </ul> <p>Example: flooding vs. adequate rainfall, violent weather phenomena: tornadoes, blizzards, etc.</p> <ul style="list-style-type: none"> <li>✓ Explain the use of weather instruments.</li> </ul> <p>Examples: rain gauge, weather vane, thermometer, and</p>		

		<p>barometer</p> <p>Identify the Earth's atmosphere, biosphere, lithosphere, and hydrosphere.</p>		
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**Indicator 2: Analyze essential principles and ideas about the composition and structure of the universe.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Comprehension)	<b>4.E.2.1. Students are able to describe the motions of Earth, Sun, and Moon.</b>	<ul style="list-style-type: none"> <li>• Revolution and rotation</li> <li>✓ Use terminology to describe the phases of the Moon. Examples: waning moon or waxing moon</li> <li>✓ Describe relative size and position of moons, planets, and stars.</li> <li>✓ Identify the characteristics of the planets.</li> </ul>		

		<p>Explain the causes for earth's seasons</p> <p>Examples: appearance, size, distance from the Sun.</p> <p>Explain the causes for Earth's seasons.</p>		
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**Fourth Grade Earth/Space Science  
Performance Descriptors**

<b>Advanced</b>	<p><b>Fourth grade students performing at the advanced level:</b></p> <ul style="list-style-type: none"> <li>• demonstrate the water cycle;</li> <li>• interpret a weather map;</li> <li>• describe the relationship between the tilt of the Earth and seasons.</li> </ul>
<b>Proficient</b>	<p><b>Fourth grade students performing at the proficient level:</b></p> <ul style="list-style-type: none"> <li>• explain the basic water cycle;</li> <li>• identify negative and positive effects of weather conditions;</li> <li>• describe the relationship between rotation and revolution of the Earth.</li> </ul>
<b>Basic</b>	<p><b>Fourth grade students performing at the basic level:</b></p> <ul style="list-style-type: none"> <li>• recognize the basic water cycle;</li> <li>• describe the weather today;</li> <li>• demonstrate rotation using a globe.</li> </ul>

**Fourth Grade Science, Technology, Environment, and Society**

**Indicator 1: Analyze various implications/effects of scientific advancement within the environment and society.**

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
(Comprehension)	<b>4.S.1.1. Students are able to describe how people continue to invent new ways of doing things, solving problems, and getting work done.</b>	<ul style="list-style-type: none"> <li>• Ways progress makes our lives easier</li> <li>• People and inventions can have tremendous impact on our daily lives.</li> </ul> <p>Examples: CDs vs. tapes; cell phones vs. telephones; ziplock baggies vs. wax paper</p>		
(Comprehension)	<b>4.S.1.2. Students are able to explain how new ideas and inventions often affect people.</b>	<ul style="list-style-type: none"> <li>• Explain the benefits of new ideas and inventions.</li> </ul> <p>Examples: television, electric lights</p>		

**Indicator 2: Analyze the relationships/interactions among science, technology, environment, and society.**

*Note: These skills should be taught and practiced in grade-level study of Physical, Life, and Earth/Space Science although mastery is not expected at these grade levels.*

<b>Bloom's Taxonomy Level</b>	<b>Standard</b>	<b>Supporting Skills and Examples</b>	<b>Assessments</b>	<b>Resources</b>
		<p>✓ Identify South Dakota environmental concerns and describe possible solutions.</p> <p>Example: Pollution along our highways and roads led to our adopt-a-highway program.</p> <ul style="list-style-type: none"> <li>• Describe the relationship between the use of natural resources and the environment.</li> </ul> <p>✓ Example: Open-pit mining in the Black Hills led to reclamation.</p>		

**Fourth Grade Science, Technology, Environment, and Society  
Performance Descriptors**

<b>Advanced</b>	<b>Fourth grade students performing at the advanced level:</b> <ul style="list-style-type: none"><li>• analyze the positive and negative ways electricity has changed our lives.</li></ul>
<b>Proficient</b>	<b>Fourth grade students performing at the proficient level:</b> <ul style="list-style-type: none"><li>• describe ways electricity has changed our lives.</li></ul>
<b>Basic</b>	<b>Fourth grade students performing at the basic level:</b> <ul style="list-style-type: none"><li>• sequence a group of pictures depicting the progression of communication from the telegraph to cell phones.</li></ul>

