Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – Elementary School (Grades K-5)

How to Read the Grade Level Core Content Connectors

The South Dakota Science Core Content Connectors (CCCs) are alternate academic achievement standards (AAAS) for students with the most significant cognitive disabilities. They are intended to promote access to grade-level content standards by pinpointing the big ideas and concepts of the *2024 South Dakota Science Standards*. The CCCs reflect rigorous science expectations and opportunities for students to learn essential science concepts and procedures given guidance from peers and adults, so that all students can engage in sophisticated science and engineering practices.

As shown in the illustration below, each set of CCCs has a title. The title reveals the organization of the CCCs, which is based on the disciplinary core ideas (DCIs) from the *Framework for K-12 Science Education*. Below the title is the corresponding South Dakota Science Standard. Below the standard are the specific CCCs (listed left to right) to address the science and engineering practices (SEPs), disciplinary core ideas, and crosscutting concepts that, when combined, address the "big idea" of the South Dakota science standard above.

Science and Engineering Practices. The blue shaded text on the left includes the CCC for the science and engineering practices used to address the South Dakota science standard listed above. The bold headings are derived from the eight categories detailed in the *Framework for K-12 Science Education*.

Disciplinary Core Ideas. The orange shaded text in the middle includes the CCCs to address the South Dakota science standard listed above. The CCCs are arranged by bold headings representing how the core ideas in the *Framework for K-12 Science Education* are divided into a total of 39 sub-ideas representing the 11 core ideas: four in Life Science, four in Physical Science, and three in Earth and Space Science. The CCCs represent what students should understand about that sub-idea at the end of the grade. The CCCs are bulleted to be certain that each statement is distinct.

Crosscutting Concepts. The green shaded text on the right includes the CCCs to address the South Dakota science standard listed above. The CCCs are arranged by bold headings which are derived from the seven categories detailed in the *Framework for K-12 Science Education*.

<table>
<tr><th colspan="3">Grade. Title</th></tr>
<tr><td colspan="3">South Dakota Science Standard Code. South Dakota science standard descriptor.</td></tr>
<tr><th>Science and Engineering Practices
Core Content Connectors</th><th>Disciplinary Core Ideas
Core Content Connectors</th><th>Crosscutting Concepts
Core Content Connectors</th></tr>
<tr><td>Planning and Carrying Out Investigations
With guidance and support from peers and adults, investigate …</td><td>PS2.A: Forces and Motion
• Recognize that …</td><td>Cause and Effect
With guidance and support from peers and adults, compare the effect …</td></tr>
</table>

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

Kindergarten Physical Science Conceptual Understanding*:

K-PS2 Motion and Stability: Forces and Interactions		
K-PS2-1. Plan and carry out an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, investigate and describe the effect caused by different strengths and directions of pushes and pulls on the motion of an object.	**PS2.A: Forces and Motion** • Recognize that pushes and pulls can have different strengths and directions. **PS2.B: Types of Interactions** • Recognize the effect caused by different strengths or directions of pushes and pulls on the motion of an object.	**Cause and Effect** With guidance and support from peers and adults, compare the effect on the motion of an object caused by changes in the strength or direction of the pushes and pulls.

K-PS2 Motion and Stability: Forces and Interactions		
K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. Alignment may include K-2-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, use graphical or visual displays (e.g., pictures, pictographs, drawings, written observations, tables, charts) to determine if a design solution causes the intended change in speed or direction of motion of an object.	**PS2.A: Forces and Motion** • Recognize that pushing or pulling on an object can change the speed or direction of its motion. **ETS1.A: Defining and Delimiting an Engineering Problem** • Identify if the design solution works as intended to change the speed or direction of an object with a push or a pull	**Cause and Effect** With guidance and support from peers and adults, describe whether the push or pull from the design solution causes the intended change in speed or direction of motion of an object.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

K-PS3 Energy		
K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, record observations of the relative warmth of materials in the presence and absence of sunlight (i.e., qualitative measures of temperature; e.g., hotter, warmer, colder).	**PS3.B: Conservation of Energy and Energy Transfer** • Compare the warmth of Earth materials placed in sunlight and the same Earth materials placed in shade.	**Cause and Effect** With guidance and support from peers and adults, determine the relative warmth of materials in sunlight and in shade (i.e., qualitative measures of temperature).

K-PS3 Energy		
K-PS3-2. Design and build a structure that will reduce the warming effect of sunlight on an area. Alignment may include K-2-ETS1-2		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, design and build a structure that reduces warming on an area caused by the sun.	**PS3.B: Conservation of Energy and Energy Transfer** • Recognize that the design of a structure (e.g., umbrella, canopy, tent) will reduce the warming caused by the sun. **ETS1.B: Developing Possible Solutions** • Identify a design structure that will reduce the warming effect of sunlight on an area	**Cause and Effect** With guidance and support from peers and adults, determine whether a structure meets expectations in terms of cause (a structure blocks sunlight) and effect (less warming of the surface).

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

Kindergarten Life Science Conceptual Understanding*:

K-LS1 From Molecules to Organisms: Structures and Processes		
K-LS1-1. Describe patterns of what plants and animals (including humans) need to survive.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, collect data about plants' need for water and light (e.g., observations of plants being grown in a classroom).	**LS1.C: Organization for Matter and Energy Flow in Organisms** • Identify that animals need water and food to live and grow. • Identify that plants need water and light to live and grow.	**Patterns** With guidance and support from peers and adults, describe patterns in provided data that show plants need light and water to live and grow and animals need food and water to live and grow.

Kindergarten Earth and Space Science Conceptual Understanding*:

K-ESS2 Earth's Systems		
K-ESS2-1. Plan and carry out observations of local weather conditions to describe patterns over time		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, use and share graphical displays (e.g., pictures, charts, tables) to organize data from observations (i.e., firsthand or from media) about local weather conditions.	**ESS2.D: Weather and Climate** • Observe and identify patterns in weather conditions using observations of local weather.	**Patterns** With guidance and support from peers and adults, recognize weather patterns across months (e.g., some months have more hot days, some have more rainy days).

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

K-ESS2 Earth's Systems		
K-ESS2-2. Engage in argument from evidence for how plants and animals (including humans) can change the environment to meet their needs.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, identify examples of plants changing their environments (e.g., plant roots lifting sidewalks) and examples of animals (including humans) changing their environments (e.g., ants building an ant hill) to meet their needs as evidence to support an argument.	**ESS2.E: Biogeology** • Identify examples of how animals change their environments to meet their needs. • Identify examples of how plants change their environments to meet their needs. **ESS3.C: Human Impacts on Earth Systems** • Recognize that the way humans can affect the environment in which they live.	**Systems and System Models** With guidance and support from peers and adults, describe how plants affect other parts of their systems by changing their environments to meet their needs (e.g., roots push soil aside as they grow to better absorb water) and how animals (including humans) affect other parts of their systems by changing their environments to meet their needs (e.g., some animals store food for winter).

K-ESS3 Earth and Human Activity		
K-ESS3-1. Use a model to represent the characteristics of and the relationship between various plants and animals in the places they live.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, identify and describe the components of a model (e.g., representation, diagram, drawing, physical replica, diorama, dramatization, storyboard) to show the relationship between the needs of different plants and animals (including humans) and the places they live.	**ESS3.A: Natural Resources** • Given a model (e.g., representation, diagram, drawing), describe the relationship between the needs of different animals and the places they live (e.g., deer eat buds and leaves and live in forests).	**Systems and System Models** With guidance and support from peers and adults, use a model to describe relationships between specific plants and animals and where they live (e.g., fish live in water environments, deer live in forests).

K-ESS3 Earth and Human Activity		
K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. Alignment may include K-2-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Asking Questions and Defining Problems With guidance and support from peers and adults, identify how weather patterns (e.g., some events are more likely in certain regions) help scientists predict severe weather before it happens.	**ESS3.B: Natural Hazards** • Identify how weather forecasting can help people avoid the most serious impacts of severe weather events. **ETS1.A: Defining and Delimiting an Engineering Problem** • Recognize questions that will obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.	**Cause and Effect** With guidance and support from peers and adults, describe how weather forecasting can help people prepare for and respond to specific types of local weather (e.g., stay indoors during severe weather).

K-ESS3 Earth and Human Activity		
K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and living things in the local environment. Alignment may include K-2-ETS1-2		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Obtaining, Evaluating, and Communicating Information With guidance and support from peers and adults, make observations of how people affect the land, water, air, and/or other living things in the local environment in positive and negative ways.	**ESS3.C: Human Impacts on Earth Systems** • Identify different solutions that people can apply to the way they live to reduce the impact on the land, water, air, and other living things. **ETS1.B: Developing Possible Solutions** • Identify a design that will reduce the impact of humans on land, water, air, and living things in the local environment	**Cause and Effect** With guidance and support from peers and adults, identify examples of choices that people can make to reduce negative impacts on the local environment.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

First Grade Physical Science Conceptual Understanding*:

1-PS4 Waves and their Applications in Technologies for Information Transfer		
1-PS4-1. Plan and carry out an investigation to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, investigate and describe that sounds can cause materials to vibrate and vibrating materials can cause sounds.	**PS4.A: Wave Properties** • Recognize that sounds can cause materials to vibrate. • Recognize that vibrating materials can make sound.	**Cause and Effect** With guidance and support from peers and adults, identify a cause-and-effect relationship between sound and vibrating materials (i.e., vibrating materials can make sound and that sound can make materials vibrate).

1-PS4 Waves and their Applications in Technologies for Information Transfer		
1-PS4-2. Construct an evidence-based account for how objects can be seen only when illuminated.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, demonstrate and describe that if an object in the dark is lit (e.g., turning on a light in the dark space or from light the object itself gives off), it can be seen.	**PS4.B: Electromagnetic Radiation** • Recognize that objects can be seen only when illuminated by an external light source or when they give off their own light.	**Cause and Effect** With guidance and support from peers and adults, connect the evidence to support the phenomenon that objects cannot be seen if there is no light to illuminate them, but the same object in the same space can be seen if a light source is introduced.

1-PS4 Waves and their Applications in Technologies for Information Transfer		
1-PS4-3. Plan and carry out an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, design and build a structure that reduces warming caused by the sun.	**PS4.B: Electromagnetic Radiation** • Recognize that some materials allow light to pass through them, others allow only some light through, and others block all the light.	**Cause and Effect** With guidance and support from peers and adults, answer questions about what happens when objects made of different materials (e.g., clear plastic, clouded plastic, cardboard, or a mirror) are placed in the path of a beam of light.

1-PS4 Waves and their Applications in Technologies for Information Transfer		
1-PS4-4. Design and build a device that uses light or sound to solve the problem of communicating over a distance. Alignment may include K-2-ETS1-2		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, describe, design, and build a device (e.g., light source to send signals, cups and string [telephone], or pattern of drum beats) that is able to send or receive information over a long distance.	**PS4.C: Information Technologies and Instrumentation** • Recognize features of devices that people use to send and receive information over long distances. **ETS1.B: Developing Possible Solutions** • Identify a design that uses light or sound to solve the problem of communicating over a distance.	**Cause and Effect** With guidance and support from peers and adults, answer questions about what human life would be like without the use of technology.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

First Grade Life Science Conceptual Understanding*:

1-LS1 From Molecules to Organisms: Structures and Processes		
1-LS1-1. Construct an explanation and design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. Alignment may include K-2-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, identify and design a solution for human problems that can be solved by mimicking plant or animal solutions (e.g., a helmet to protect a bicyclist that mimics a turtle's shell).	**LS1.A: Structure and Function** • Identify how animals use their external parts to help them survive, grow, and meet their needs. • Identify how plants use their external parts to help them survive, grow, and meet their needs. **LS1.D: Information Processing** • Recognize and identify body parts of animals that capture and convey different kinds of information needed for growth and survival. Identify animals' responses to these inputs with behaviors that help them survive. Recognize that plants also respond to some external inputs. **ETS1.A: Defining and Delimiting an Engineering Problem** • Recognize a solution for a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet needs.	**Cause and Effect** With guidance and support from peers and adults, recognize that eyes and ears help protect animals by detecting danger.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

1-LS1 From Molecules to Organisms: Structures and Processes		
1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Obtaining, Evaluating, and Communicating Information With guidance and support from peers and adults, obtain information about behaviors of animal offspring that help the offspring survive (e.g., crying, chirping).	**LS1.B: Growth and Development of Organisms** • Identify behaviors of offspring that help them survive. • Identify behaviors between parents and offspring that help the offspring survive.	**Patterns** With guidance and support from peers and adults, describe the patterns of what animal parents and offspring do to help offspring survive (e.g., parents protect offspring when danger is present).

1-LS3 Heredity: Inheritance and Variation of Traits		
1-LS3-1. Construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, make observations (i.e., evidence) of features of adult plants or animals (i.e., parents) and features of the offspring that have similar, but not identical features (e.g., size and shape of body parts, color and/or type of any hair, leaf shape, stem rigidity).	**LS3.A: Inheritance of Traits** • Identify a similarity or a difference in an external feature (e.g., shape of leaves on plants or shape of ears on animals) between young plants and animals and their parents.	**Patterns** With guidance and support from peers and adults, identify patterns of similarities and differences in features between parents and offspring.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – First Grade

First Grade Earth and Space Science Conceptual Understanding*:

1-ESS1 Earth's Place in the Universe		
1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, organize data from given observations (firsthand or from media), including objects visible in the sky during the day and night, the position of the sun in the sky at various times during the day, and the position of the moon in the sky at various times during the day or night.	**ESS1.A: The Universe and its Stars** • Describe patterns of movement of the sun, moon, and stars as seen from Earth. • Use patterns of movement to predict appearances of the sun or moon.	**Patterns** With guidance and support from peers and adults, use data from given observations (firsthand or from media), including objects visible in the sky during the day and night, the position of the sun in the sky at various times during the day, and the position of the moon in the sky at various times during the day or night, to describe patterns of objects visible in the sky during the day and night.

1-ESS1 Earth's Place in the Universe		
1-ESS1-2. Make observations and compare the amount of daylight at different times of the year		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, collect data through observations (firsthand or from media) of relative length of the day (sunrise to sunset) for periods of time in a year.	**ESS1.B: Earth and the Solar System** • Make relative comparisons between the amount of daylight in the winter to the amount of daylight in the spring or fall.	**Patterns** With guidance and support from peers and adults, identify patterns of human behavior regarding the relative length of daylight (sunrise to sunset) in relationship to the time of the year (e.g., whether it will be light or dark when waking in the morning, at breakfast, when having dinner, or going to bed at night).

Second Grade Physical Science Conceptual Understanding*:

2-PS1 Matter and its Interactions		
2-PS1-1. Plan and carry out an investigation to describe and classify different kinds of materials by their observable properties.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, use graphical displays (e.g., pictures, charts, graphs), to describe and organize materials by their properties (e.g., color, texture, hardness, flexibility, solid, or liquid).	**PS1.A: Structure and Properties of Matter** • Classify different kinds of materials by their observable properties (e.g., color, texture).	**Patterns** With guidance and support from peers and adults, identify observable patterns in the properties of materials to classify the different kinds of materials.

2-PS1 Matter and its Interactions		
2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. Alignment may include K-2-ETS1-3		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, test materials then describe the relationship between the materials and their properties (e.g., metal is strong, paper is absorbent, rocks are hard, sandpaper is rough).	**PS1.A: Structure and Properties of Matter** • Match a property of a material (e.g., hard, flexible, absorbent) to a potential purpose (e.g., hardness of a wooden shelf results in it being better suited for supporting materials than a soft sponge). **ETS1.C: Optimizing the Design Solutions** • Recognize that testing different materials can determine which materials have the properties that are best suited for an intended purpose	**Cause and Effect** With guidance and support from peers and adults, identify and describe relationships between properties of materials and some potential uses. (e.g., hardness is good for breaking objects or supporting objects; flexibility is good to keep a material from breaking).

2-PS1 Matter and its Interactions		
2-PS1-3. Construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, describe evidence from observations that an object made of a small set of pieces can be disassembled and made into a new object.	**PS1.A: Structure and Properties of Matter** • Identify how a variety of objects can be built up from a small set of pieces.	**Energy and Matter** With guidance and support from peers and adults, support an explanation using evidence that different objects can be built from the same set of pieces.

2-PS1 Matter and its Interactions		
2-PS1-4. Construct an evidence-based argument using reasoning and evidence that some changes caused by heating or cooling can be reversed and some cannot.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, identify evidence that shows whether the change in the material after heating is reversible (e.g., water may become ice again, a cooked egg remains a solid, cookie dough that is baked does not return to its uncooked form when cooled) by engaging in argument.	**PS1.B: Chemical Reactions** • Identify examples of heating substances which cause changes that are sometimes reversible and sometimes not. • Identify examples of cooling substances which cause changes that are sometimes reversible and sometimes not.	**Cause and Effect** With guidance and support from peers and adults, identify and describe the relationship of changes caused by heating or cooling that can be reversed by cooling or heating (e.g., ice that is heated can melt into water, but the water can be cooled and can freeze back into ice [and vice versa]).

Second Grade Life Science Conceptual Understanding*:

2-LS2 Ecosystems: Interactions, Energy, and Dynamics		
2-LS2-1. Plan and carry out an investigation to determine if plants need sunlight and water to grow.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, collect data during an investigation about whether plants need sunlight and water to grow.	**LS2.A: Interdependent Relationships in Ecosystems** • Recognize that plants need water and light to grow.	**Cause and Effect** With guidance and support from peers and adults, describe the effect on plant growth when withholding light but providing water, withholding water but providing light, or withholding both water and light.

2-LS2 Ecosystems: Interactions, Energy, and Dynamics		
2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. Alignment may include K-2ETS1-2		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop a simple model that mimics how plant and animal structures interact to move pollen or disperse seeds.	**LS2.A: Interdependent Relationships in Ecosystems** • Recognize that plants need animals to move their seeds around. **ETS1.B: Developing Possible Solutions** • Identify a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	**Structure and Function** With guidance and support from peers and adults, describe the relationships between components of a simple model that allows for movement of pollen or seeds.

2-LS4 Biological Evolution: Unity and Diversity		
2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, investigate and describe how the different plants and animals in their habitats can be observed and organized.	**LS4.D: Biodiversity and Humans** • Recognize that different kinds of living things live in different habitats on land and in water.	**Systems and System Models** With guidance and support from peers and adults, observe and use observations to identify characteristics of plant and animal diversity including land habitats (e.g., playground, garden, forest, parking lot) and water habitats (e.g., pond, stream, lake).

Second Grade Earth and Space Science Conceptual Understanding*:

2-ESS1 Earth's Place in the Universe		
2-ESS1-1. Use information from several sources to construct an explanation that Earth events like volcanic explosions, earthquakes, weather, erosion, etc. can occur quickly or slowly.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, describe the evidence from observations (firsthand or from media (e.g., books, videos, pictures, historical photos)), that some Earth events occur quickly (e.g., the occurrence of flood, severe storm, volcanic eruption, earthquake, landslides, erosion of soil) and some Earth events occur slowly (e.g., erosion of weathering of rocks).	**ESS1.C: The History of Planet Earth** • Use evidence to understand that some Earth events happen quickly and can be observed (e.g., flood, volcano eruption, earthquake, or erosion of soil) and some Earth events happen slowly (e.g., erosion or weathering of rocks).	**Stability and Change** With guidance and support from peers and adults, connect evidence to support the reasoning that some Earth events and the resulting changes can be directly observed, while other Earth events (e.g., erosion or weathering of rocks) can be observed only after long periods of time.

2-ESS2 Earth's Systems		
2-ESS2-1. Compare multiple solutions to develop a model designed to slow or prevent wind or water from changing the shape of the land. Alignment may include K-2-ETS1-3.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, describe and compare solutions in terms of how each solution slows or prevents wind or water from changing the shape of the land.	**ESS2.A: Earth Materials and Systems** • Identify a solution (e.g., using shrubs, grass, or trees) to slow or prevent wind or water from changing the shape of the land. **ETS1.C: Optimizing the Design Solution** • Identify multiple solutions to slow or prevent wind or water from changing the shape of the land.	**Stability and Change** With guidance and support from peers and adults, identify problems created by both slow and rapid changes in the shape of the land (e.g., many mild rainstorms or a severe storm and flood).

2-ESS2 Earth's Systems		
2-ESS2-2. Obtain and evaluate information about the shapes and kinds of land and bodies of water in your local areas.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop and use a map or model to represent and identify kinds of land (e.g., hill or mountain) and specific bodies of water (e.g., creek, ocean, lake, river) within a given area.	**ESS2.B: Plate Tectonics and Large-Scale System Interactions** • Identify land features and bodies of water (e.g., hill, lake) of an area on a map or model.	**Stability and Change** With guidance and support from peers and adults, recognize the similarities and differences in the way maps represent land and water features in different areas.

2-ESS2 Earth's Systems		
2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid, liquid, or gas.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Obtaining, Evaluating, and Communicating Information With guidance and support from peers and adults, use books and other reliable media as sources of scientific information to identify where water is found on Earth, including in oceans, rivers, lakes, and ponds.	**ESS2.C: The Roles of Water in Earth's Surface Processes** • Recognize that water is found in many types of places and exists as solid ice and in liquid form.	**Patterns** With guidance and support from peers and adults, identify patterns of where water is found, and what form it is in.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – Third Grade

Third Grade Physical Science Conceptual Understanding*:

3-PS2 Motion and Stability: Forces and Interactions		
3-PS2-1. Plan and carry out an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, collect and record data during an investigation of the effects of different forces on an object's motion (e.g., starting, stopping, or changing direction).	**PS2.A: Forces and Motion** • Identify ways to change the motion of an object (e.g., number, size, or direction of forces). **PS2.B: Types of Interactions** • Describe how objects in contact exert forces on each other.	**Cause and Effect** With guidance and support from peers and adults, provide evidence that demonstrates how balanced and unbalanced forces determine an object's motion, during the investigation.

3-PS2 Motion and Stability: Forces and Interactions		
3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence for how a pattern can be used to predict future motion.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, collect measurements of the motion of an object as it repeats a pattern over time (e.g., a pendulum swinging, a ball moving on a curved track, a magnet repelling another magnet).	**PS2.A: Forces and Motion** • Describe the patterns of an object's motion in various situations (e.g., a pendulum swinging, a ball moving on a curved track, a magnet repelling another magnet). • Predict future motion of an object given its pattern of motion.	**Patterns** With guidance and support from peers and adults, use data to identify a pattern that can be used to predict future motion.

3-PS2 Motion and Stability: Forces and Interactions		
3-PS2-3. Ask questions about cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Asking Questions and Defining Problems With guidance and support from peers and adults, ask relevant questions that arise from observations of two objects not in contact with each other interacting through electric or magnetic forces.	**PS2.A: Types of Interactions** • Recognize cause and effect relationships of magnetic interactions between two objects not in contact with each other (e.g., how the orientation of magnets affects the direction of the magnetic force). • Recognize cause and effect relationships of electric interactions (e.g., the force on hair from an electrically charged balloon) between two objects not in contact with each other (e.g., how the distance between objects affects the strength of the force).	**Cause and Effect** With guidance and support from peers and adults, identify relationships about two objects not in contact with each other (i.e., sizes of forces, distances apart, and the orientation of the magnets).

3-PS2 Motion and Stability: Forces and Interactions		
3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets. Alignment may include 3-5-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Asking Questions and Defining Problems With guidance and support from peers and adults, identify a solution for a simple problem which can be solved by applying scientific ideas about magnets.	**PS2.B: Types of Interactions** • Identify and describe the scientific ideas necessary for solving a given problem about magnets (e.g., size of the force depends on the properties of objects, distance between the objects, and orientation of magnetic objects relative to one another). **ETS1.A Defining and Delimiting an Engineering Problem** • Recognize that a simple design problem can be solved by applying scientific ideas about magnets	**Cause and Effect** With guidance and support from peers and adults, identify the features for a successful solution (e.g., identify that a magnet keeps a door latched) to a problem.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – Third Grade

Third Grade Life Science Conceptual Understanding*:

3-LS1 From Molecules to Organisms: Structures and Processes		
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.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop models of a life cycle and identify the relevant components (i.e., organisms, birth, growth, reproduction, death).	**LS1.B: Growth and Development of Organisms** • Recognize that organisms have unique and diverse life cycles. • Identify a common pattern between models of different life cycles.	**Patterns** With guidance and support from peers and adults, use models to describe that although organisms can display life cycles that look different, they all follow the same pattern.

3-LS2 Ecosystems: Interactions, Energy, and Dynamics		
3-LS2-1. Construct an argument that some animals form groups that help members survive.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, identify evidence to support the claim that being part of a group helps animals obtain food, defend themselves, and cope with changes in their ecosystem.	**LS2.D: Social Interactions and Group Behavior** • Recognize that animals within a group help the group obtain food for survival, defend themselves, and survive changes in their ecosystem.	**Cause and Effect** With guidance and support from peers and adults, identify cause and effect relationships (i.e., members of a group of animals have greater success in defending themselves than those same animals acting alone) related to being part of a group.

3-LS3 Heredity: Inheritance and Variation of Traits		
3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variations of these traits exist in a group of similar organisms.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, interpret graphical displays (e.g., table, chart, graph) and visual representations (e.g., drawings, pictures, photographs) showing variations in similar traits in a grouping of similar organisms.	**LS3.A: Inheritance of Traits** • Identify similarities in the traits of a parent and the traits of an offspring. • Recognize that characteristics of organisms are inherited from their parents. **LS3.B: Variation of Traits** • Identify variations in similar traits in a group of similar organisms.	**Patterns** With guidance and support from peers and adults, describe that the pattern of similarities in traits between parents and offspring, and between siblings, provide evidence that traits are inherited.

3-LS3 Heredity: Inheritance and Variation of Traits		
3-LS3-2. Use evidence and reasoning to support the explanation that traits can be influenced by the environment.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, identify evidence that explains how inherited traits can be influenced by the environment (e.g., height or weight of a plant or animal, color or quantity of the flowers).	**LS3.A: Inheritance of Traits** • Identify examples of inherited traits that vary between organisms of the same type. **LS3.B: Variation of Traits** • Identify a cause-and-effect relationship between an environmental factor and its effect on a given variation in a trait (e.g., not enough water produces plants that have fewer flowers than plants that had more water available).	**Cause and Effect** With guidance and support from peers and adults, identify environmental factors that vary for organisms of the same type (e.g., amount of food or amount of exercise an animal gets) that may influence organisms' traits.

3-LS4 Biological Evolution: Unity and Diversity		
3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, use graphical displays (e.g., table, chart, graph) to identify relationships between the fossils of organisms and the environments in which they lived.	**LS4.A: Evidence of Common Ancestry and Diversity** • Recognize that fossils represent plants and animals that lived long ago. • Recognize that fossils provide evidence about the environments in which organisms lived long ago (e.g., fossilized seashells indicate shelled organisms that lived in aquatic environments.).	**Scale, Proportion, and Quantity** With guidance and support from peers and adults, identify relationships shown in data that fossils represent plants and animals that lived long ago.

3-LS4 Biological Evolution: Unity and Diversity		
3-LS4-2. Use evidence and reasoning 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.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, select from given evidence that which is necessary to describe an explanation of potential benefits of a given variation of a characteristic (e.g., the light coloration of some moths makes them difficult to see on the bark of a tree).	**LS4.B: Natural Selection** • Identify features and characteristics that enable an organism to survive in a particular environment.	**Cause and Effect** With guidance and support from peers and adults, describe a cause-and-effect relationship between a specific variation in a characteristic (e.g., longer thorns) and its effect on the ability of the individual organism to survive (e.g., plants with longer thorns are less likely to be eaten).

3-LS4 Biological Evolution: Unity and Diversity		
3-LS4-3. Construct an argument with evidence how some organisms thrive, some struggle to survive, and some cannot survive in a particular habitat.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, describe evidence (e.g., characteristics of an environment, characteristics of an organism, needs of an organism) to support the claim that in a particular habitat, some organisms can survive well, some can survive less well, and some cannot survive at all.	**LS4.A: Adaptation** • Identify changes in a habitat that would cause some organisms to survive and reproduce, some to move to new locations, and some to die.	**Cause and Effect** With guidance and support from peers and adults, identify evidence which demonstrates that if an environment does not meet the needs of an organism, that organism cannot survive within that environment.

3-LS4 Biological Evolution: Unity and Diversity		
3-LS4-4. Make an evidence-based claim about the validity of a solution to a change in the environment that affects the types of plants and animals that live there. Alignment may include 3-5-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, describe how a solution that makes changes to one part of the system (e.g., a feature of the environment), affects the other parts of the system (e.g., plants and animals).	**LS2.C: Ecosystem Dynamics, Function, and Resilience** • Recognize that 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. **LS4.D: Biodiversity and Humans** • Identify evidence that supports a claim that change in habitats affects the organisms living there. • Identify a solution to a problem that is caused when the environment changes. **ETS1.A: Designing and Delimiting an Engineering Problem** • Identify a solution to a change in the environment that affects the types of plants and animals that live there.	**Systems and System Models** With guidance and support from peers and adults, describe how a change in the given environment causes a problem for the existing plants and animals living within that area.

Third Grade Earth and Space Science Conceptual Understanding*:

3-ESS2 Earth's Systems		
3-ESS2-1. Represent data in tables and graphical displays to describe weather conditions during a particular season.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, use graphical displays (e.g., table, chart, graph) to organize the given data related to weather conditions by season.	**ESS2.D: Weather and Climate** • Use data to describe observed weather conditions (e.g., temperature, precipitation, wind direction) during a season. • Use data to predict weather conditions (e.g., temperature, precipitation, wind direction) during a season.	**Patterns** With guidance and support from peers and adults, use patterns of weather conditions in different seasons to predict weather conditions expected during a season (e.g., "In our town in the summer it is typically hot, as indicated on a bar graph over time; therefore, the prediction is that next summer, it will be hot.").

3-ESS2 Earth's Systems		
3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Obtaining, Evaluating, and Communicating Information With guidance and support from peers and adults, use books and other reliable media to gather information about climates in different regions of the world (e.g., equatorial, polar).	**ESS2.D: Weather and Climate** • Identify climates in different regions of the world (e.g., equatorial, polar).	**Patterns** With guidance and support from peers and adults, describe a climate pattern in a region and use it to predict weather conditions in that region.

3-ESS1 Earth and Human Activity		
3-ESS3-1. Make an evidence-based claim about the validity of a design solution that reduces the impacts of a weather-related hazard. Alignment may include 3-5-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, evaluate how a solution reduces the impact of a weather-related hazard.	**ESS3.B: Natural Hazards** • Identify the positive impact of a solution humans can take to reduce the impact of weather-related hazards (e.g., barriers to prevent flooding). **ETS1.A: Designing and Delimiting an Engineering Problem** • Identify a solution that reduces the impacts of a weather-related hazard	**Cause and Effect** With guidance and support from peers and adults, identify problems caused by a weather-related hazard (e.g., heavy rains cause flooding, lightning causes fires).

Fourth Grade Physical Science Conceptual Understanding*:

4-PS3 Energy		
4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, use evidence to show that the faster a given object is moving, the more observable impact it can have on another object (e.g., more or less sound produced in a collision).	**PS3.A: Definitions of Energy** • Recognize that moving objects contain energy and the faster an object moves, the more energy it has.	**Energy and Matter** With guidance and support from peers and adults, describe the relative speeds of two objects (e.g., faster vs. slower objects).

4-PS3 Energy		
4-PS3-2. Make observations to provide evidence for how energy can be transferred from place to place by sound, light, heat, and electric currents.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, collect qualitative data related to motion, sound, heat, or light causing a different type of energy to be observed after an interaction.	**PS3.A: Definitions of Energy** • Identify examples of how energy can be moved from place to place (i.e., through sound or light traveling; by electrical currents; heat passing from one object to another).	**Energy and Matter** With guidance and support from peers and adults, identify evidence that energy, in the form of light, sound, heat, and motion, can be transferred from place to place by sound, light, heat, or electric currents.

4-PS3 Energy		
4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Asking Questions and Defining Problems With guidance and support from peers and adults, make qualitative measures of energy (e.g., relative motion, relative speed) of an object before and after a collision.	**PS3.C: Relationship Between Energy and Forces** • Identify the change in energy or the change in the objects' motions when objects collide (e.g., speeds as objects interact, direction).	**Energy and Matter** With guidance and support from peers and adults, predict reasonable outcomes about the changes in energy that occur after objects collide.

4-PS3 Energy		
4-PS3-4. Design, test, and refine a device that converts energy from one form to another. Alignment may include 3-5-ETS1-1		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, design devices which convert energy from one form to another and describe how they are used to solve problems.	**PS3.B: Conservation of Energy and Energy Transfer** • Recognize an example of how energy can be converted from one form to another form (e.g., electric circuits that convert electrical energy into light, motion, sound or heat). **PS3.D: Energy in Chemical Processes and Everyday life** • Recognize the expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. **ETS1.A: Designing and Delimiting an Engineering Problem** • Identify a device that converts energy from on form to another.	**Energy and Matter** With guidance and support from peers and adults, identify a device which transforms energy (e.g., a light bulb to convert electrical energy into light energy; a motor to convert electrical energy into energy of motion).

4-PS4 Waves and their Applications in Technologies for Information Transfer		
4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and to provide evidence that waves can cause objects to move.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop and use a model to describe that waves of the same type can vary in terms of amplitude and wavelength and describe how this might affect the motion, caused by a wave, of an object.	**PS4.A: Wave Properties** • Describe the properties of waves using a model (e.g., drawings, diagrams) to show amplitude and wavelength. • Identify relationships involving wave amplitude, wavelength, and the motion of an object (e.g., when the amplitude increases, the object moves more).	**Patterns** With guidance and support from peers and adults, recognize patterns in the motion of an object caused by a wave as it passes.

4-PS4 Waves and their Applications in Technologies for Information Transfer		
4-PS4-2. Develop a model to describe how light reflecting from objects and entering the eye allows objects to be seen.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop and use a model to determine which surfaces reflect or absorb light or allow light to pass through.	**PS4.B: Electromagnetic Radiation** • Recognize that an object can be seen when light reflected from its surface enters the eye.	**Cause and Effect** With guidance and support from peers and adults, use a model to describe the relationship between seeing objects that do not produce their own light and light reflecting off the object and into the eye.

4-PS4 Waves and their Applications in Technologies for Information Transfer		
4-PS4-3. Create and compare multiple solutions that use patterns to transfer information. Alignment may include 3-5-ETS1-3		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, generate devices that can be used to communicate (send and receive information) over long distances.	**PS4.C: Information Technologies and Instrumentation** • Compare ways in which patterns have been used in the past to communicate over distance (e.g., the use of smoke signals, drums, Morse code on a telegraph). • Contrast ways in which patterns have been used in the past to communicate over distance (e.g., the use of smoke signals, drums, Morse code on a telegraph). **ETS1.C: Optimizing the Design Solutions** • Identify multiple solution that use patterns to transfer information.	**Patterns** With guidance and support from peers and adults, identify similarities and differences in the types of patterns used (e.g., verbal messages can be encoded in patterns of flashes of light to be decoded by someone else across the room) in the solutions to determine whether some ways of transmitting information (e.g., picture, message) are more effective than others.

Fourth Grade Life Science Conceptual Understanding*:

4-LS1 From Molecules to Organisms: Structures and Processes		
4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, construct an argument that supports the idea that plants and animals have internal and external structures that function together as part of a system to support survival, growth, behavior, and reproduction.	**LS1.A: Structure and Function** • Identify external macroscopic structures (e.g., bird beaks, eyes, feathers, roots, needles on a pine tree) that support growth, survival, behavior, and reproduction of organisms. • Identify internal structures (e.g., heart, muscles, bones) that support growth, survival, behavior, and reproduction of organisms.	**Systems and System Models** With guidance and support from peers and adults, identify structures that work together as part of a system to support survival, growth, behavior, and/or reproduction (e.g., the heart works with the lungs to carry oxygenated blood throughout the system; thorns protect the plant).

4-LS1 From Molecules to Organisms: Structures and Processes		
4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, identify components (e.g., information about the surroundings, sense receptors, brain, animal's actions) of a model illustrating how animals can use their perceptions to guide their actions.	**LS1.D: Information Processing** • Recognize sense receptors provide different kinds of information, which is processed by the brain. • Identify how animals use their sense receptors to respond to different types of information (e.g., sound, light, odor, temperature) in their surroundings with behaviors that help them survive. • Identify how animals use their memories to help them survive.	**Systems and System Models** With guidance and support from peers and adults, identify examples of how animals use their brains to process sensory information (e.g., sound, light, odor, temperature) which allows experiences to be perceived, stored as memories, and influence behavior (e.g., an animal learns which color fruit is bitter and avoids eating it).

Fourth Grade Earth and Space Science Conceptual Understanding*:

4-ESS1 Earth's Place in the Universe		
4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, use evidence to support an explanation of how a landscape changes over time by the occurrence of events (e.g., earthquakes) due to Earth forces.	**ESS1.C: The History of Planet Earth** • Identify rock formations that show how the Earth's surface has changed over time (e.g., change following earthquakes). • Identify older fossils as being found in deeper, older rock layers.	**Patterns** With guidance and support from peers and adults, identify a pattern of rock layers and fossils (e.g., a rock layer containing shells and fish below a rock layer containing fossils of land animals and plants is a pattern indicating that, at one point, the landscape had been covered by water and later it was dry land).

4-ESS2 Earth's Systems		
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, record measurements (e.g., motion of water, direction of wind, number or size of rocks transported) made during an investigation of weathering.	**ESS2.A: Earth Materials and Systems** • Use data to compare differences in the shape of the land due to the effects of weathering or erosion. **ESS2.E: Biogeology** • Identify how living things affect the shape of the land.	**Cause and Effect** With guidance and support from peers and adults, contrast erosion rates in the presence or absence of plants growing in or on Earth material.

4-ESS2 Earth's Systems		
4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, interpret data of Earth's features using graphical displays (e.g., table, chart, graph) based on maps to determine the locations of different Earth features (e.g., mountains, volcanoes continental boundaries, oceans, earthquakes).	**ESS2.B: Plate Tectonics and Large-Scale System Interactions** • Use maps to locate different land and water features of Earth. • Recognize that earthquakes and volcanoes often occur along the boundaries between continents.	**Patterns** With guidance and support from peers and adults, identify patterns in the location of Earth features, including the locations of mountain ranges, earthquakes, and volcanoes.

4-ESS3 Earth and Human Activity		
4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and how their uses affect the environment.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Obtaining, Evaluating, and Communicating Information With guidance and support from peers and adults, gather and combine information from books and other reliable media about energy resources (e.g., solar, wind, water) and fossil fuels.	**ESS3.A: Natural Resources** • Identify the natural sources from which energy and fuels that humans use are derived. • Identify environmental effects associated with the use of a given energy resource.	**Cause and Effect** With guidance and support from peers and adults, identify positive and negative environmental effects of using a given energy resource.

4-ESS3 Earth and Human Activity		
4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. Alignment may include 3-5-ETS1-2		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Constructing Explanations and Designing Solutions With guidance and support from peers and adults, use scientific information about an Earth process (e.g., earthquakes, tsunamis, volcanic eruptions) and its effects to generate a solution that reduces its effect on humans.	**ESS3.B: Natural Hazards** • Describe solutions to reduce the impact of a natural Earth process (e.g., earthquake, flood, volcanic activity) on humans. **ETS1.B: Developing Possible Solutions** • Identify a solution to reduce the impacts of natural Earth processes on humans.	**Cause and Effect** With guidance and support from peers and adults, describe cause and effect relationships between the Earth process (e.g., earthquakes, tsunamis, volcanic eruptions) and its observed effect.

Fifth Grade Physical Science Conceptual Understanding*:

5-PS1 Matter and Its Interactions		
5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop a model that represents the phenomenon that gases are made from matter particles that are too small to see and are moving freely around in space (e.g., inflation and shape of a balloon).	**PS1.A: Structure and Properties of Matter** • Identify in a model (e.g., picture, diagram) which shows that all matter can be broken down into smaller and smaller pieces until they are too small to be seen by human eyes.	**Scale, Proportion, and Quantity** With guidance and support from peers and adults, use the model to describe how matter composed of tiny particles too small to be seen can account for observable phenomena (e.g., air inflating a basketball).

5-PS1 Matter and Its Interactions		
5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total mass of matter is conserved.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Using Mathematics and Computational Thinking With guidance and support from peers and adults, measure and graph the given mass of substances using standard units to calculate the difference between the total mass of each substance before and after each is heated, cooled, or mixed.	**PS1.A: Structure and Properties of Matter** • Recognize that the total mass of matter is conserved when it changes form. **PS1.B: Chemical Reactions** • Recognize that the total mass of matter is conserved before and after they are heated, cooled, or mixed.	**Scale, Proportion, and Quantity** With guidance and support from peers and adults, use measurements of standard units and calculations to describe the natural pattern that the total mass of the substances does not change after they are heated, cooled, and/or mixed.

5-PS3 Matter and Its Interactions		
5-PS1-3. Make observations and measurements to identify materials based on their properties.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, plan an investigation of how materials can be identified based on their observable and measurable properties.	**PS1.A: Structure and Properties of Matter** • Recognize that materials can be classified based on a variety of observable physical properties (e.g., shape, texture, buoyancy, color, magnetism, solubility). • Classify materials (e.g., shape, texture, buoyancy, color, magnetism, solubility) by measurable physical properties.	**Scale, Proportion, and Quantity** With guidance and support from peers and adults, collect and record data using standard units that can be used to classify materials based on their observable and measurable properties.

5-PS1 Matter and Its Interactions		
5-PS1-4. Plan and carry out an investigation to determine if the mixing of two or more substances results in new substances.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Planning and Carrying Out Investigations With guidance and support from peers and adults, conduct an investigation, which includes providing evidence for whether new substances are formed by mixing two or more substances.	**PS1.B: Chemical Reactions** • Recognize that when two or more different substances are mixed, a new substance with different properties may be formed. • Identify the changes that occur when two or more substances are mixed using evidence provided from data.	**Cause and Effect** With guidance and support from peers and adults, record quantitative (e.g., weight) and qualitative properties (e.g., state of matter, color, texture, odor) of the substances to be mixed and of the resulting substances.

5-PS2 Motion and Stability: Forces and Interactions		
5-PS2-1. Support an evidence-based argument that the gravitational force exerted by Earth on objects is directed toward the center of the Earth.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, recognize evidence to support a claim that includes the idea that the gravitational force exerted by Earth on objects is directed down toward the center of Earth.	**PS2.B: Types of Interactions** • Recognize that the gravitational force exerted by Earth on objects is directed down.	**Cause and Effect** With guidance and support from peers and adults, observe and describe the relationship between objects that are dropped and the appearance that the objects fall straight down.

5-PS3 Energy		
5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, identify components of a model (e.g., the sun, energy, animals, plants) illustrating the phenomenon that energy in animals' food was once energy from the sun.	**PS3.D: Energy in Chemical Processes and Everyday Life** • Recognize that the energy in animals' food was once energy from the sun.	**Energy and Matter** With guidance and support from peers and adults, use the model to identify relationships between energy from the sun and animals' needs and uses for energy (e.g., growth, warmth, movement).

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – Fifth Grade

Fifth Grade Life Science Conceptual Understanding*:

5-LS1 From Molecules to Organisms: Structures and Processes		
5-LS1-1. Engage in an evidence-based argument that plants get the materials they need for growth chiefly from air and water.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, collect evidence (e.g., changes in the weight of soil and water within a closed system with a plant) to support the claim that plants grow chiefly from air and water instead of soil.	**LS1.C: Organization for Matter and Energy Flow in Organisms** • Recognize that plants acquire material for growth chiefly from air and water, not from soil.	**Energy and Matter** With guidance and support from peers and adults, describe the relationship between growth of plants and what plants require to grow to evidence of change in weight of plants (i.e., soil cannot account for the change in weight as a plant grows and since plants take in water and air, both of which could contribute to the increase in weight during plant growth, plant growth must come chiefly from water and air).

5-LS2 Ecosystems: Interactions, Energy, and Dynamics		
5-LS2-1. Develop a model to describe the movement of matter and energy among producers, consumers, decomposers, and the environment.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop a model of the phenomena that movement of matter within an ecosystem is related to its key components (i.e., matter, plants, animals, decomposers, environment).	**LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Identify a model that shows the movement of matter (e.g., plant growth, eating, composting) through living things.	**Systems and System Models** With guidance and support from peers and adults, use the model to describe the relationship between organisms and the exchange of matter from and back into the environment.

Core Content Connectors (CCCs) linked to the
2024 South Dakota Science Standards – Fifth Grade

Fifth Grade Earth and Space Science Conceptual Understanding*:

5-ESS1 Earth's Place in the Universe		
5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to distances from the Earth.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Engaging in Argument from Evidence With guidance and support from peers and adults, describe the evidence, data, and/or models that support the claim that the apparent brightness of the sun and stars is due to their relative distances from Earth.	**ESS1.A: The Universe and its Stars** • Identify that the sun appears larger and brighter than other stars because the sun is much closer to Earth than other stars.	**Scale, Proportion, and Quantity** With guidance and support from peers and adults, recognize that even though the sun is very far from Earth, it is much closer than other stars.

5-ESS1 Earth's Place in the Universe		
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.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, organize data in a graphical display pertaining to daily and seasonal changes caused by Earth's rotation and orbit around the sun.	**ESS1.D: Earth and the Solar System** • Use data to describe similarities and differences in the timing of observable changes in shadows. • Use data to describe similarities and differences in the timing of observable changes in day and night. • Use data to describe similarities and differences in the timing of observable changes in the appearance of stars that are visible only in particular months.	**Patterns** With guidance and support from peers and adults, use the organized data to find the similarities and differences in the timing of observable changes in shadows, daylight, and the appearance of stars to show that events occur at different rates.

5-ESS2 Earth's Systems		
5-ESS2-1. Develop a model to describe the interaction of geosphere, biosphere, hydrosphere, and atmosphere.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Developing and Using Models With guidance and support from peers and adults, develop a model of ways the four major Earth systems (i.e., geosphere, hydrosphere, atmosphere, biosphere) interact to affect Earth's surface materials and processes.	**ESS2.A: Earth Materials and Systems** • Identify the Earth's major systems (i.e., geosphere, biosphere, hydrosphere, and/or atmosphere). • Recognize that the Earth's major systems interact and affect Earth's surface materials and processes.	**Systems and System Models** With guidance and support from peers and adults, use the model to describe ways in which the parts of two major Earth systems interact to affect the Earth's surface materials and processes.

5-ESS2 Earth's Systems		
5-ESS2-2. Describe and graph the amounts and percentages of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Analyzing and Interpreting Data With guidance and support from peers and adults, organize data in a graphical display of the amounts and percentages of salt water and fresh water in the various reservoirs to provide evidence about the distribution of water on Earth	**ESS2.C: The Roles of Water in Earth's Surface Processes** • Recognize that the majority of water on Earth is found in the oceans as salt water and most of the Earth's fresh water is stored in glaciers.	**Scale, Proportion, and Quantity** With guidance and support from peers and adults, use graphs of the relative amounts of total salt water and total fresh water in each of the reservoirs to describe that the majority of water on Earth is found in the oceans as salt water and most of the Earth's fresh water is stored in glaciers.

5-ESS3 Earth and Human Activity		
5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.		
Science and Engineering Practices **Core Content Connectors**	**Disciplinary Core Ideas** **Core Content Connectors**	**Crosscutting Concepts** **Core Content Connectors**
Obtaining, Evaluating, and Communicating Information With guidance and support from peers and adults, obtain information from books and other reliable media about positive and negative effects on the environment as a result of human activities.	**ESS3.C: Human Impacts on Earth Systems** • Identify ways people can help protect the Earth's resources and environment.	**Systems and System Models** With guidance and support from peers and adults, identify interactions between components of environmental systems due to human activities.