Nebraska

Science Standards

with

Extended Indicators

and

Instructional Clarification

for

Students with Significant Disabilities

taking the

NeSA Alternate Assessment Science (NeSA-AAS)

Improving students' ability to learn, communicate, and collaborate through education.

Nebraska Science Standards
with
Extended Indicators and Clarifications
for
Students with Significant Disabilities
Taking the NeSA Alternate Assessment Science (NeSA-AAS)

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Introduction

The National Science Education Standards (NSES) published by the National Research Council, is the foundation for current science education. The national goal of NSES is that all students should achieve scientific literacy. Science standards apply to all students, regardless of age, gender, cultural or ethnic background, disabilities, aspirations, or interest and motivation in science. (NRC, 1996, p.2).

The science standards and extended indicators in this document were developed by Nebraska educators to facilitate and direct science instruction for students with significant intellectual disabilities. They are directly aligned to the Nebraska Science Standards and indicators adopted October, 2010 by the Nebraska State Board of Education.

Students with Significant Intellectual Disabilities

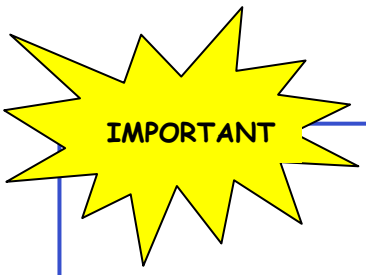
In the United States, approximately 1% of school-aged children have an intellectual disability that is "characterized by significant limitations both in intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills" (U.S. Department of Education, 2002 and American Association of Intellectual and Developmental Disabilities, 2009). These students show evidence of cognitive functioning in the range of severe to profound and need extensive or pervasive support. In addition to significant intellectual disabilities, students may have accompanying communication, motor, sensory, or other impairments.

Background in Literacy and Students with Significant Intellectual Disabilities

Students with significant intellectual disabilities first gained mandated access to the general curriculum through the Individuals with Disabilities Education Act Amendments (IDEA) of 1997 (PL 105-17), with further access guaranteed following the passage of the No Child Left Behind Act (NCLB) of 2001 (PL 107-110). The No Child Left Behind Act was a reauthorization of the Elementary and Secondary Education Act of 1965 (PL 89-10). NCLB required states to

1) establish challenging standards aligned with the general education curriculum.
2) develop an assessment program that measures student progress against those standards in the areas of reading/language arts and math.
3) hold schools accountable for ensuring that students achieve the standards.

An important part of NCLB is the regulation that all children, including those with the most significant intellectual disabilities, make adequate yearly progress (AYP) toward achieving grade-level standards (U.S. Department of Education, 2004). Progress is monitored using alternate assessments reflecting alternate achievement standards and/or extended indicators (Center for Literacy and Disabilities Studies, University of North Carolina at Chapel Hill, 2009). Nebraska students' progress is measured through the Nebraska State Accountability (NeSA) tests.



The Role of Extended Indicators

For students with significant intellectual disabilities, achieving grade-level standards is not the same as meeting grade-level expectations because their instructional program addresses extended indicators.

It is important for teachers of students with significant intellectual disabilities to recognize that extended indicators are not meant to be viewed as sufficient skills or understandings. Extended indicators must be viewed only as access or entry points to the grade-level standards. The extended indicators in this document are not intended as the end goal, but rather a starting place for moving students forward to conventional science concepts. Lists following "e.g." in the extended indicator are provided only as possible examples.

Alternate Assessment Determination Guidelines

The student taking a NeSA Alternate Assessment is characterized by significant limitations both in intellectual functioning and adaptive behavior which is expressed in conceptual, social, and practical adaptive skills and that originates before age 18 (American Association of Intellectual and Developmental Disabilities, 2009). It is important to recognize the huge disparity of skills possessed by students taking an alternate assessment and to consider the uniqueness of each child.

Thus, the IEP team must consider all of the following guidelines when determining the appropriateness of a curriculum based on Extended Indicators and the use of the NeSA Alternate Assessment.

- **The student requires extensive, pervasive, and frequent supports in order to acquire, maintain, and demonstrate performance of knowledge and skills.**
- **The student's demonstrated cognitive ability and adaptive behavior prevent completion of the general academic curriculum, even with appropriately designed and implemented modifications and accommodations.**
- **The student's curriculum and instruction is closely aligned to the Nebraska Science Standards with extended indicators.**
- **The student may have accompanying communication, motor, sensory, or other impairments.**

The Nebraska Department of Education's technical assistance document ***"IEP Team Decision Making Guidelines – Nebraska State Accountability (NeSA) Tests for Students with Disabilities"*** provides additional information on selecting appropriate NeSA assessments for students with disabilities. http://www.nde.state.ne.us/sped/assessment.html

Nebraska Rule 51 00707A2 requires a "statement of measurable annual goals, including academic and functional goals, designed to

007.07A2a Meet the child's needs that result from the child's disability to enable the child to be involved in and make progress in the general education curriculum…"

Nebraska Rule 51 007.07A7 requires the student's IEP to include…"a statement of why:

007.07A7a The child cannot participate in the regular assessment; and

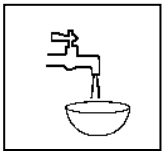
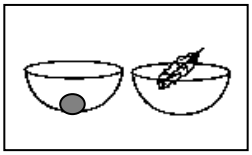
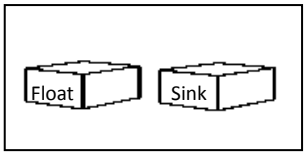
007.07A7b The particular alternate assessment selected is appropriate for the child;..."

Nebraska Fifth Grade Science Standards and Extended Indicators
for
Students with Significant Disabilities

1. Inquiry, the Nature of Science and Technology

K-12 Comprehensive Science Standard - Inquire, the Nature of Science, and Technology
Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.

Abilities to Do Scientific Inquiry

Indicator	SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.	
Extended Indicator	**SCE 5.1.1 Students will conduct investigations that lead to a final product.**	
	Standards Clarification	• (SCE51.1.c) Students will follow safety rules and use equipment appropriately. ➢ Example: The student demonstrates safety rules (e.g., use hot pads, carry scissors and knives with the points down.) ➢ Example: The student correctly matches pictures of familiar safety equipment with the location in which it should be used (e.g., seatbelt/car, helmet/bike, hot pads/stove. • (SCE5.1.1.d) Students will make a relevant observation. ➢ Example: When taking care of classroom plants, the student observes that plants have green leaves. ➢ Example: While watching a worm, the student observes that the worm craws in order to move. ➢ Example: On a walk in the fall, the student observes that the leaves on the trees turn colors. • (SCE5.1.1.g) Students will relate the procedures they followed in an investigation. ➢ Example: The student fills a bowl with water and places several given items in the bowl to determine which sinks and which floats. The items that sink, he places in the "Sink" box and the items that float in the "Float" box. After completing this investigation, the student describes the process by placing the pictures in the correct order.   

Nature of Science

Indicator	SC 5.1.2 Students will describe how scientists go about their work.	
Extended Indicator	**SCE 5.1.2 Students will observe how scientists go about their work.**	
	Standards Clarification	• (SCE 5.1.2.a) Students will recognize that scientific explanations are based on evidence/observations. ➢ Example: The student places a stalk of celery (with leaves) in a glass of water, adds food coloring to the water, and observes the coloring move up the stalk and into the leaves. The student determines that when watering a plant, the water goes up the stem of a plant and into its leaves. • (SCE 5.1.2.c) Students will recognize different people study science. ➢ Example: After watching "Bill Nye the Science Guy and looking at a book about Thomas Edison, the student determines that they both study science and are called scientists. ➢ Example: After visiting different work places (e.g., veterinarian's office, farm, pharmacy,) the student recognizes that each needs science to do his/her job. The veterinarian knows about animals. The farmer knows about plants. The pharmacist knows about medicine and how to mix them. **Teacher Note:** Students should be familiar with the word "scientist".

Technology

Indicator	SC 5.1.3 Students will solve a simple design problem.	
Extended Indicator	**SCE 5.1.3 Students will solve a simple problem**	
	Standards Clarification	• (SCE 5.1.3.a) Students will identify a simple problem. ➢ Example: The student turns on a lamp and it doesn't work. ➢ Example: The student observes that a classroom plant is turning yellow and the leaves are limp. A photograph is taken of the plant. • (SCE 5.1.3.b) Students will propose a solution to a simple problem. ➢ Example: The student looks to see if the lamp is plugged in. ➢ The student tells the teacher the plant needs to be watered. • (SCE 5.1.3.c) Students will implement a solution to a simple problem. ➢ Example: The student finds the lamp is unplugged. The teacher plugs it in. ➢ Example: The student gets a glass of water and waters the plant each day. A photograph is taken of the student watering the plant. • (SCE 5.1.3.d) Students will evaluate the implementation. ➢ Example: The student observes that the lamp does or does not work.

	➢ Example: The student observes that the plant leaves are or are not no longer yellow or limp. • (SCE 5.1.3.e) Students will communicate the problem, implementation, and solution. ➢ Example: The student puts the photographs (taken during the problem solving process) in order to communicate the problem and solution.

2. Physical Science

K-12 Comprehensive Science Standard – Physical Science

Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.

Matter

Indicator	SC 5.2.1 Students will explore and describe the physical properties of matter and its changes.	
Extended Indicator	**SCE 5.2.1 Students will explore and recognize the physical properties of matter and its changes.**	
	Standards Clarification	• (SC5.2.1.a) Students will combine substances and describe the results. ➢ Example: After putting red food coloring into clear water, the student stirs the mixture and recognizes that the water has now turned red. ➢ Example: The student mixes water, salt, vegetable oil, food coloring, flour, and cornstarch to make play dough. • (SC5.2.1.b) Students will sort objects by color, size, texture, or weight. ➢ Example: Given a basket with rocks of different sizes, the student sorts them into piles of big rocks and little rocks. ➢ Example: On a fall day, the student and teacher collect leaves from trees and bushes. The student sorts the leaves by color. • (SC5.2.1.c) Students will identify heavier/lighter and longer/shorter objects. ➢ Example: The student uses a "hand scale" method and determines that the rock in her left hand is heavier than the leaf in her right hand. ➢ Example: The student uses a "non-conventional" measuring tool and finds a worm is three paper clips long. • (SC 5.2.1.d) Students will observe state changes (e.g. liquid – solid, gas-liquid). ➢ Example: The student holds an ice cube and recognizes it is a solid. He puts the ice cube in a glass, sits it in the Sun, and watches it melt. The student recognizes that it is no longer a solid but turned into a liquid. ➢ Example: The student blows out a candle and recognizes that the melted wax (liquid) as it cools becomes hard (a solid). **Teacher Note:** The term "hand scale" refers to placing an object in each hand and determining which object is heavier/ lighter. To work appropriately, it is important that there is a definite difference in the weight of the two objects being measured. "Non-conventional" measuring tools can be laid side-by-side to measure an object (e.g., pencils, post-it-notes, pieces of yarn). The student needs to be familiar with the terms "liquid" and "solid".

Force and Motion

Indicator	SC 5.2.2 Students will identify the influence of forces on motion.	
Extended Indicator	**SCE 5.2.2 Students will identify the influence of forces on motion.**	
	Standards Clarification	• (SC 5.2.2.b) Students will recognize changes in motion due to outside forces. ➢ Example: The student and teacher talk about a ball is laying in one spot on the playground (not moving). When asked how the student can make the ball move, the student kicks the ball. ➢ Example: After the student places a toy car on the "starting line" of a slanted surface, she lets go of the car and it rolls downward. ➢ Example: After watching a pinwheel in a room with no breeze, the student blows on the pinwheel to make it move and determines the stronger wind changes how it spins. ➢ After the student places a rock on the sidewalk, he watches for it to move. The student recognizes that the rock will not move by itself. It will only move if he pushes it or kicks it. • (SC 5.2.2.b) Students will observe the effects of motion with respect to push/pull. ➢ Example: The student recognizes that to open a door they must either push or pull it. ➢ Example: The student correctly follows the directions to either push or pull a wagon. ➢ Example: When given a scooter, the student determined the direction he needed to push or pull it in order to reach the finish line. • (SC 5.2.2.c) Students will observe the affects of a magnetic force. ➢ Example: Given a magnet, the student experiments to see what items in the classroom will "stick to" the magnet. ➢ Example: Given a paper plate with iron filings on it, the student moves the filings by moving the magnet under the plate. ➢ Example: Using a magnet, the student moves a paperclip by putting the magnet close to it. **Teacher Note:** Students should be familiar with the terms "push" and "pull" and the difference between the two actions. While the student need not recognize the various shapes of a magnet, the student must be familiar with the term "magnet".

Energy

Indicator	SC 5.2.3 Students will observe and identify signs of energy transfer.	
Extended Indicator	**SCE 5.2.3 Students will observe and identify signs of energy transfer.**	
	Standards Clarification	• (SC 5.2.3.a) Students will recognize that sound is made by the vibration of objects. ➢ Example: The student feels the vibration of sound when placing his hand on the radio speaker. ➢ Example: The student hears the sound of a rubber band and watches it vibrate when stretched and plucked. • (SC 5.2.3.c) Students will recognize that light can travel thorough some materials and not others. ➢ Example: Using a flashlight, the student determines light passes through a glass pitcher, the window in the classroom door, and the terrarium walls. ➢ Example: Using a flashlight, the student determines that light will not go through the wooden door, their desk, or a piece of cardboard. • (SC 5.2.3.d) Students will recognize different methods of making heat (e.g., friction, burning, incandescent light bulbs). ➢ Example: After coming in from recess on a cold day, the student rubs her hands together to warm them. (friction) ➢ Example: After the teacher briskly rubs a wooden block with sandpaper, the student touches the block and recognizes it has gotten warm. • (SC 5.2.3.e) Students will identify items that keep things warm and cold. ➢ Example: After putting hot soup in a thermos bottle, the student waits until lunch, opens the thermos and tastes that the soup is still hot. ➢ Example: Before going outside on a cold day, the student puts on mittens to keep her hands warm. ➢ Example: The teacher pours hot chocolate in a styrofoam cup with a lid and a coffee cup. After about ten minutes, the student tastes each and determines the chocolate is hotter in the styrofoam cup than the coffee cup. • (SC 5.2.3.f) Students will experiment with and recognize open and closed circuits. ➢ Example: Modeling an Open and Closed Current Using a toy train, the student builds the tracks so they make a "closed" circle (closed circuit). The student drives the train around and around the track. The teacher removes one section of the track (open circuit). The student tries to run the train around the open track and stops when the track comes to an end. The student recognizes that the track must be closed or touching in order for the train to travel all the way around the track.

	➢ Example: Modeling an Open and Closed Current The student uses blocks to build a track for toy cars to drive on. The track is in the shape of a closed circle (closed circuit). The student drives the car all the way around the track. The student removes several blocks from the track to form an open track (open circuit) and determines the car cannot travel all the way around the track. ➢ Example: When the teacher creates a simple circuit using a battery, insulated wire, and a small light bulb, the student determines that electricity is running though a closed path (circuit) and making the bulb light up. ➢ Example: When the teacher disconnects the wire from a simple circuit (using a battery, insulated wire, and a small light bulb), the student determines the bulb will not light up because the path (circuit) is open and electricity can't run all the way through. **Teacher Note:** The terms "open" and "closed" are required knowledge for this standard. The term "circuit" is not required knowledge if another word such as "path" or "road" is more appropriate for student understanding.

3. Life Science

K-12 Comprehensive Science Standard – Life Science

Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.

Structure and Function of Living Systems

<table>
<tr><td>Indicator</td><td colspan="2">SC 5.3.1 Students will investigate and compare the characteristics of living things.</td></tr>
<tr><td>Extended Indicator</td><td colspan="2">SCE 5.3.1 Students will recognize that living things grow.</td></tr>
<tr><td></td><td>Standards Clarification</td><td>• (SC5.3.1.a) Students will sort living and nonliving things by determining if they grow or not.
➢ Example: Given pictures of items (i.e., a rock, a dog, a flower, a cookie, a ball, a boy) the student sorts the pictures into living and nonliving groups.
➢ Example: On a walk around the playground, the student identifies things that are living/grow (i.e., trees, bugs, grass, children) and nonliving/do not grow (i.e., swings, bricks, ball, jump rope, sidewalk).
• (SC5.3.1.b) Students will identify parts of plants.
➢ Example: Given a flower, the student indicates each item as stated by the teacher (example: petal, leaf, and stem).
• (SC5.3.1.b) Students will identify parts of animals.
➢ Example: As the teachers sings “Head, Shoulder, Knees, and Toes” song, the student touches each part of their body.
➢ Example: Using a stuffed animal, the student indicates the animal’s head, legs, ears, and eyes.

Teacher Note: To avoid student confusion, it is important to stay away from examples of nonliving things (such as logs, coal, fossils) that were at one time living things.</td></tr>
</table>

Heredity

Indicator	SC 5.3.2 Students will identify variations of inherited characteristics and life cycles.
Extended Indicator	**SCE 5.3.2 Students will observe inherited characteristics and life cycles.**
Standards Clarification	• (SC 5.3.2.a) Students will observe the life cycle of plants and animals. ➢ Example: Given pictures, the student matches a parent animal to its offspring: cow/calf, horse/colt, duck/duckling, elephant/elephant calf, mother/baby, and dog/puppy. ➢ Example: The student takes a cutting from a plant, places it in a jar of water to root, and then plants the rooted cutting in soil to watch it grow. ➢ Example: The student matches pictures depicting three stages (baby, youth, adult) in the life of animals that do not change appearance except to get bigger (e.g., puppy/little dog,/adult dog, new-born pig/ piglet,/hog, new-born calf/small cow/cow, egg/chick/chicken, baby/child/adult). • (SC 5.3.2.b) Students will recognize inherited characteristics of organisms. ➢ Example: The student sorts pictures of animals into groups of inherited traits (e.g., four-legged animals, two-legged animals, animals with tails, animals with fur, animals with feathers).

Flow of Matter and Energy in Ecosystems

Indicator	SC 5.3.3 Students will describe relationships within an ecosystem.
Extended Indicator	**SCE 5.3.3 Students will recognize relationships within an ecosystem.**
Standards Clarification	• (SC 5.3.3.a) Students will recognize food chains. ➢ Example: Given pictures of a cow eating grass, the Sun shining on grass, milking a cow, and a child drinking a glass of milk, the student puts them in the correct order to form a food chain.  • (SC 5.3.3.b) Students will recognize plants (producers) and those that eat plants (consumers). ➢ Example: After looking at a picture book about planting a garden, the student will select pictures of animals that might eat garden plants (e.g., rabbits, raccoons, bugs). • (SC 5.3.3.c) Students will identify factors necessary for plants to survive. ➢ Example: The student determines (with the rest of the class) what jobs the student of the week must do in order to take care of the class plants. The list will include: watering the plant, putting it in a sunny window, giving it food (fertilizer) when the teacher says it is time.

	• (SC 5.3.3.d) Students will recognize examples of littering and recycling. ➢ Example: The student helps recycle the soda cans collected in the school by putting them in large bags and delivering them with the teacher to the recycling center. ➢ Example: When shown pictures (e.g., trash strewn along a highway, papers in the school hallway, gum stuck under a table, and trash placed in a trash can) the student puts an X on those pictures that are examples of littering. **Teacher Note:** The terms "producer" and "consumer" are not required knowledge. In this standard the term producer refers to "plants" and the word consumer refers to "the eater of the plants"

Biodiversity

Indicator	SC 5.3.4 Students will describe changes in organisms over time.	
Extended Indicator	**SCE 5.3.4 Students will identify changes in organisms over time.**	
	Standards Clarification	• (SC 5.3.4.a) Students will identify a survival adaptation in an organism. ➢ Example: When given colored pictures of several animals (e.g., caterpillar, squirrel, butterfly, polar bear) and pictures of different backgrounds (snow, green leaf, brown bushes, flowers) the student determines which animal could best hide in each background. ➢ Example: After reading the Aesop fable "The Ant and the Grasshopper" the student will recognize that some animals store and hide food until winter when food is not available. **Teacher Note:** The terms "camouflage" and "survival adaptations" are not required knowledge if other terms are more appropriate for student understanding.

4. Earth and Space Science

K-12 Comprehensive Science Standard – Earth and Space Science
Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.

Earth in Space

Indicator	SC 5.4.1 Students will observe and describe characteristics, patterns, and changes in the sky.	
Extended Indicator	**SCE 5.4.1 Students will observe and recognize changes in the sky.**	
	Standards Clarification	• (SC5.4.1.a) Students will observe and recognize changes to the Moon throughout the month. ➢ Example: Every other day, the student looks at and displays pictures of the Moon printed off the internet. The student recognizes that the Moon's shape changes. ➢ When given several pictures of the Moon, the student determines which one is a "full" moon. • (SC5.4.1.b) Students will recognize the motion of the Sun and the Moon in the sky is a recognizable pattern. ➢ Example: For several days, the student looks out a school window and marks (with tape, a sticky note, etc.) the location of the Sun several days of putting sticky notes on the window in the position of the Sun at the beginning of the school day, lunch time, and the end of the school day. The student recognizes that the Sun moves across the sky in the same direction each day. **Teacher Note:** As part of the student's safety, they should be taught not to look directly at the Sun.

Earth Structures and Processes

Indicator	SC 5.4.2 Students will observe and describe Earth's materials, structure, and processes.	
Extended Indicator	**SCE 5.4.2 Students will observe and recognize Earth's materials and processes.**	
	Standards Clarification	• (SC 5.4.2.a) Students will recognize different characteristics of rocks, water, and soil. ➢ Example: Without looking at the contents, the student feels inside three cups and determines (by touch) that there is a rock in one cup, water in the second cup, and dirt the third cup. • (SC 5.4.2.b) Students will recognize weathering and erosion. ➢ Example: While walking around the school building with an adult, the student will recognize things that are rusting. ➢ Example: The student piles dirt into the middle of a cake pan. As the teacher slowly pours water on the dirt, the student observes the water washing away the dirt (water erosion). ➢ After putting dirt at one end of a shallow box, the student uses a straw and tries to blow dirt from one end of the box to the other. (wind erosion) • (SC 5.4.2.c) Students will recognize how Earth's materials are used by people on a daily basis (plants, water, rocks/soil). ➢ Example: After looking at pictures of buildings, the student sorts them into two groups – those built from the wood of trees and those built from stone/rocks. ➢ The student discovers that the cement in the sidewalk has small rocks in it. ➢ Example: The student takes a tour of the school and identifies all the places where water is used (e.g., kitchen when cooking lunch, drinking fountains, washing hands in classroom, bathrooms). **Teacher Note:** Students need to be familiar with the term "erosion." They do not need to distinguish between weathering and erosion for this standard.

Energy in Earth's Systems

Indicator	SC 5.4.3 Students will observe and describe the effects of energy changes on Earth.	
Extended Indicator	**SCE 5.4.3 Students will observe and recognize the effects of energy changes on Earth.**	
	Standards Clarification	• (SC 5.4.3.a) Students will recognize the Sun's warming effect on land and water. ➢ Example: Given a container with mud in it, the student places it in a sunny spot and watches the mud turn into dirt. ➢ Example: The student feels the sidewalk in a shady place and the sidewalk in a sunny place and recognizes that the sidewalk is warmer in a sunny place.

	• (SC 5.4.3.b) Students will observe and record changes in weather. ➢ Example: The student observes the weather at the same time every day and records their observation on the classroom calendar using pictures or stickers. • (SC 5.4.3.c) Students will recognize the differences between the four seasons. ➢ Example: The student sorts pictures displaying characteristics of the four seasons into appropriately labeled boxes. ▪ Winter (e.g., snowflakes, icicles, snow drifts) ▪ Spring (e.g., rain, tulips, trees budding, bird nest with eggs) ▪ Summer (e.g., the Sun high overhead, flowers blooming, green trees) ▪ Fall/Autumn (e.g., pumpkins, colored leaves, leaves falling from trees) ➢ Example: The student recognizes the differing temperatures of summer and winter by sorting pictures of clothing worn during those two seasons.

Earth's History

Indicator	SC 5.4.4 Students will describe environments based on fossil evidence.	
Extended Indicator	**SCE 5.4.4 Students will recognize changes occur on Earth.**	
	Standards Clarification	• (SC 5.4.4.a) Students will recognize that volcanoes, floods, and strong winds can quickly change Earth's surface. ➢ Example: After watching a volcano eruption on the internet or in a video, the student recognizes that the volcano destroyed homes, killed trees, killed animals, and covered the land with melted rock (lava). ➢ Example: After a strong thunderstorm or hailstorm, the student observes changes that were made around the school yard (e.g., branches on the ground, leaves/trash washed down the street, damage to foliage and flowers). ➢ Example: The student looks at pictures after a tornado and recognizes the changes the tornado caused (e.g., trees uprooted, building blown down, crops/gardens destroyed, leaves stripped off trees).

Nebraska Eighth Grade Science Standards and Extended Indicators
for
Students with Significant Disabilities

1. Inquiry, the Nature of Science and Technology

K-12 Comprehensive Science Standard – Inquire, the Nature of Science, and Technology
Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.

Technology

Indicator	SC 8.1.3 Students will solve a design problem which involves one or two science concepts.	
Extended Indicator	**SCE 8.1.3 Students will solve a problem using simple machines (inclined planes and wheels).**	
	Standards Clarification	• (SC 8.1.3.a) Students will recognize problems for technical design. ➢ Example: When on the first floor of a building, the student wonders how he will get to a room on the second floor. ➢ Example: During an industrial arts class, the student is given two boards and asked to attach the two pieces of wood. ➢ Example: The student is given picture of a woman trying to move a heavy piece of furniture. • (SC8.1.3.b) The student determines a simple machine that will solve the problem. ➢ Example: The student determines he must use the stairs (inclined plane) to get to the second floor. ➢ Example: The student reaches for a screw driver and a screw. ➢ Example: Given pictures of casters/wheels, a ramp, and a rake, the student determines that the caster/wheels might help the woman move the furniture. • (SC8.1.3c and SC8.1.3.d) The student implements the simple machine and determines that it solves/does not solve the problem. ➢ Example: The student uses the stairs and reaches the second floor. ➢ Example: The student uses the screw driver and successfully screws the two boards together. ➢ Example: The student is given a picture of the woman putting casters under the furniture and moving it across the room. **Teacher Note:** The student is not required to know the terms "simple machines" or "inclined plane" but should be familiar with the term "wheel". Common Inclined planes: ladder, steps, ramp, parking ramps, screws Common Wheels: wagon, bike, casters on furniture, door knob

2. Physical Science

K-12 Comprehensive Science Standard – Physical Science

Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.

Matter

Indicator	SC 8.2.1 Students will identify and describe the particulate nature of matter including physical and chemical interactions.	
Extended Indicator	**SCE 8.2.1 Students will explore and identify the physical properties and the physical changes of matter.**	
	Standards Clarification	• (SC8.2.1.d) Students will recognize that solids have definite shapes. ➢ Example: The student feels several solids placed in a sack and recognize the solid by its shape (e.g., block, pencil, crayon, apple). The student puts the objects (solids) in several places around the room and recognizes that the solids remain the same shape even when placed in other locations. • (SC8.2.1.d) Students will recognize that a liquid takes on the shape of its container. ➢ Example: The student pours the same colored water (liquid) into several different containers (e.g., tall glass, flat pan, clear vase) and determines that a liquid will change its shape depending on the shape of the container. • (SC8.2.1.d) Students will recognize that a gas is hard to see and takes on the shape of its container. ➢ Example: After blowing on his hand, the student determines that he cannot see the air, but knows it is there because he can feel it. ➢ Example: The student recognizes that air (gas) takes on the shape of its container by blowing up different shaped balloons (i.e., round, long, animal shaped). • (SC8.2.1.f) Students will recognize the conservation of matter in physical changes. ➢ Example: The student and/or teacher weigh a piece of paper. Then the student crumples the paper into a ball. The crumpled paper is reweighed and the student determines it weighs the same. The student recognizes that changing the shape of an object does not change its weight. ➢ Example: After weighing a ball of clay, the student flattens the ball of clay and reweighs it. The student determines that the ball of clay and the flattened clay weigh the same. **Teacher Note:** The student needs to be familiar with the terms “liquid”, “solid”, and “gas”. **Conservation of matter in physical changes** means the mass (weight) of certain quantities are unchanged during physical transformations.

Force and Motion

Indicator	SC 8.2.2 Students will investigate and describe forces and motion.	
Extended Indicator	**SCE 8.2.2 Students will explore and recognize forces and motion.**	
	Standards Clarification	• (SC8.2.2.b) Students will recognize that an object that is not being subjected to a force will continue to move at a constant speed and in a straight line (Newton's 1st Law of Motion). ➢ Example: When the student rolls a ball down a smooth incline, he observes that it rolls in a straight line. The student places a book in the path of the ball and rolls the ball again. The student observes that when the ball hits the book, it changes its course and goes a different direction. • (SC8.2.2.c) Students will recognize examples of equal (balanced) and not equal (unbalanced) forces. ➢ Example: The student pushes her hand against the teacher's hand (pushing with equal force) and determines that neither hand moves. The student recognizes that both are pushing the same (equal force) so neither hand moves. ➢ Example: The student pushes her hand against the teacher's hand (pushing with less force) and their hands move towards the teacher. The student recognizes he was pushing harder than the teacher. ➢ Example: The student pushes a door open when no one is on the other side. The student recognizes that the door moves because no one is pushing on the other side (unequal force). ➢ Example: The student pushes on a door when someone is pushing on the other side. The student recognizes that the door does not open because someone is pushing from the other side (equal force). • (SC8.2.2.d) Students will recognize the effects of gravity on objects. ➢ Example: When dropping a ball, the student observes that the ball falls because gravity pulls it down. ➢ Example: During an experiment, the student drops several objects (i.e., feather, rock, pencil, piece of paper) and determines that gravity pulls all objects down towards the ground/earth. **Teacher Note:** The term "equal force" is not required knowledge if another term such as "pushing harder" or "pushing less" allows the student to better understand this concept. The student must be familiar with the term "gravity" and have the understanding that gravity pulls things towards the ground/earth and keeps them from flying off into space. For this standard, students will not be expected to consider other factors (i.e., wind resistance) that influence the "rate" at which objects fall.

Energy

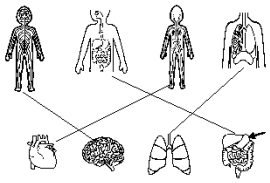
Indicator	SC8.2.3 Students will identify and describe how energy systems and matter interact.	
Extended Indicator	**SCE 8.2.3 Students will identify and describe how energy systems and matter interact.**	
	Standards Clarification	• (SC8.2.3.a) Students will recognize that vibrations create waves that spread out away from the source. ➢ Example: The student drops a penny in the middle of a tub filled with water and observes the waves spread out from the place where the penny was dropped. • (SC8.2.3.c) Students will recognize that light bounces (reflection) off some objects. ➢ Example: In a slightly darkened room, the student uses a flashlight and shines it at an angle onto several objects lying on a table (i.e., cardboard, a mirror, glass, smooth wood, sandpaper, paper, aluminum foil, shiny tin can). The student observes the reflected light on the ceiling or wall and determines if the light bounced off each object. **Teacher Note:** The student should be familiar with the term "reflection".

3. LIFE SCIENCE

K-12 Comprehensive Science Standard – Life Science

Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.

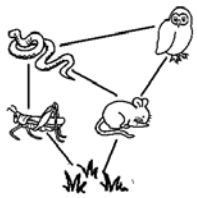
Structure and Function of Living Systems

Indicator	SC 8.3.1 Students will investigate and describe the structure and function of living organisms.	
Extended Indicator	**SCE 8.3.1 Students will explore and identify the structure and function of living things.**	
	Standard Clarification	• (SC8.3.1.d) Students will identify basic organs with their body systems. ➢ Example: When given pictures of the lungs, the heart, the brain, and the stomach, the student matches them to pictures of the circulatory system, the nervous system, the digestive system, and the respiratory system.  • (SC8.3.1.e) Students will identify how plants and animals respond to their environment. ➢ Example: The student plants grass seeds in a paper cup and sets the cup in window. The student recognizes that the grass grows toward the window (light). ➢ Example: The student reads about animals (ducks, butterflies, geese, Sandhill cranes) that migrate south in the winter and writes a report about one of the animals.

Heredity

Indicator	SC 8.3.2 Students will investigate and describe the relationship between reproduction and heredity.	
Extended Standard	**SCE 8.3.2 Students will explore and identify the relationship between reproduction and heredity.**	
	Standard Clarification	• (SC8.3.2.a) Students will recognize that personal characteristics come from their family/ancestors. ➢ Example: While looking in a mirror, the student records personal characteristics (e.g., color of eyes, color of hair, freckles, straight or curly hair). The student takes the picture/list and talks to family members to see if others in their family have the same characteristics. The student determines that some of their characteristics are like other members of their family. • (SC8.3.2.b) Students will recognize examples of reproduction. ➢ Example: After visiting a pet store, the student determines that some animals reproduce through live births (e.g., dogs, people, fish, cats, horses). ➢ Example: After watching a video called "What Animals Lay Eggs?" the student determines that some animals (chickens, turkeys, birds, turtles, alligators) have babies by laying eggs.

Flow of Matter and Energy in Ecosystems

Indicator	SC 8.3.3 Students will describe populations and ecosystems.	
Extended Indicator	**SCE 8.3.3 Students will recognize relationships within an ecosystem.**	
	Standard Clarification	• (SC8.3.3.a) Students will gain information from simple food webs ➢ Example: After looking at the food web, the student determines that snakes eat mice and grasshoppers.  • (SC8.3.3.b) Students will identify the roles of carnivores and herbivores (consumers) in an ecosystem. ➢ Example: After watching a DVD called "What Animals Eat?" the student recognizes that some animals eat meat and others eat plants. • (SC8.3.3.e) Students will recognize a population is a group of like animals in the same place. ➢ Example: The student recognizes the people in his class make the population of the class, including himself.

	➢ Example: The student recognizes that everybody in his school is the population of the school. ➢ Example: The student recognizes that all the people in his town are call the town's population. **Teacher Note: A FOOD CHAIN** is defined as the flow of energy from the Sun to a plant, to a herbivore, to a carnivore. **FOOD WEBS** are interconnected food chains. The terms "carnivore", "herbivore", and "omnivore" are not required knowledge if the terms "meat eater" and "plant eater" are more appropriate for student understanding. Students may recognize that some animals eat both plants and other animals. While students are not required to know the definition of the term "population", the teacher should frequently use the term when discussing a group of individuals at a given place and time.

Biodiversity

Indicator	SC 8.3.4 Students will identify characteristics of organisms that help them survive.	
Extended Indicator	**SCE 8.3.4 Students will identify survival characteristics of organisms.**	
	Standard Clarification	• (SC8.3.4.a) Students will identify examples of inherited characteristics that enable an animal to improve its survival rate. ➢ Example: When studying polar bears, the student recognizes that the bear's white fur helps it to hide from its enemies and to stay warm in the cold. ➢ Example: In a photograph, the student finds a praying mantis sitting in the bushes. She determines that it would be hard for a bird to find and eat the insect because it looks like the branches. • (SC8.3.4.c) Students will identify the anatomical features of animals that help them survive. ➢ Example: While studying animals, the student recognizes the duck's webbed feet help it swim, the giraffe's long neck helps it reach food/leaves in trees, and that the beaver's flat tail helps it build dams.

4. Earth and Space Science

K-12 Comprehensive Science Standard – Earth and Space Science
Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.

Earth in Space

Indicator	SC 8.4.1 Students will investigate and describe Earth and the solar system.	
Extended Indicator	**SCE 8.4.1 Students will investigate Earth and the solar system.**	
	Standard Clarification	• (SC8.4.1.a) Students will distinguish between the Sun, the Moon, and Earth. ➢ Example: Using a yellow tennis ball, a globe, and a golf ball, the student helps create a model of the placement of the Sun, Earth, and the Moon. • (SC8.4.1.b) Students will recognize how the motion of objects in the solar system relates to a day. ➢ Example: After watching "What Makes a Day?" video, the student helps demonstrate a day by using a flashlight and rotating a globe.

Earth Structures and Processes

Indicator	SC 8.4.2 Students will investigate and describe Earth's structure, systems, and processes.	
Extended Indicator	**SCE 8.4.2 Students will investigate and identify Earth's structure, systems, and processes.**	
	Standard Clarification	• (SC8.4.2.a) Students will recognize that Earth is made up of three major layers (crust mantle, core) ➢ Example: The student examines a hard-boiled egg cut in a half and determines each layer: shell, egg white and yoke. The student uses the egg as a model of Earth and labels the parts "crust" (shell), "mantle" (egg white), and "core" (yoke). ➢ Example: The student makes a model of Earth by using a golf ball as the core, covering the ball with a red layer of clay (mantle), and finally putting a layer of brown clay (crust) over the entire thing. • (SC8.4.2.e) Students will explore the impact of earthquakes on the surface of Earth. ➢ Example: In a picture of the aftermath of an earthquake, the student circles examples of its destructive effects (i.e., houses destroyed, collapsed bridges, cracks in the ground).

	• (SC8.4.2e) Students will explore the impact of volcanoes on the surface of Earth. ➢ Example: After looking at books, pictures, and videos of volcanoes, the student creates a picture of a volcano eruption. **Teacher Note:** The student needs to know the term and concept of a "layer" in order to master this extended indicator. Students must be familiar with (but not independently know) the terms "core", "mantle" and "crust". Given the terms, the student should be able to match them to each specific layer of Earth.

Energy in Earth's System

Indicator	SC 8.4.3 Students will investigate and describe energy in Earth's systems.
Extended Indicator	**Mastery not expected**

Earth's History

Indicator	SC 8.4.4 Students will use evidence to draw conclusions about changes in Earth.	
Extended Indicator	**SCE 8.4.4 Students will recognize that the surface of Earth changes today, in similar ways as in the past.**	
	Standard Clarification	• (SC8.4.4.a) Students will recognize Earth processes we see today are similar to those that occurred in the past. ➢ Example: After a local blizzard, the student and teacher read a book about the blizzard of 1812 and talk about how both events were similar. ➢ Example: During a current events session, the student shares newspaper pictures of a recent earthquake. The student then researches (i.e., looks at picture books, watches videos, looks at internet resources) major earthquakes from the past. ➢ Example: After a disaster in the area (i.e., tornado, flood, severe storm) the student asks someone from an older generation to tell them about a similar event during their youth.

Nebraska Twelfth Grade Science Standards and Extended Indicators
for
Students with Significant Disabilities

1. Inquiry, the Nature of Science and Technology

K-12 Comprehensive Science Standard - Inquire, the Nature of Science, and Technology
Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.

Abilities to Do Scientific Inquiry

Indicator	SC 12.1.1 Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.	
Extended Indicator	**SCE 12.1.1 Students will conduct an investigation that leads to an answer.**	
	Standards Clarification	• (SC12.1.1.b) Students conduct an investigation to answer a teacher-posed or self-generated question. ➢ Example: The teacher asks, "I wonder if our classroom or the music room is warmer today?" ➢ Example: The student wonders who has the longest foot in the class. • (SC12.1.1.d) Students use equipment, technology, and mathematical concepts appropriately when conducting an investigation**.** ➢ Example: The student reads the thermometer in the classroom and takes a thermometer to the music room and reads the temperature. ➢ Example: The student uses a ruler and measures each student's foot. • (SC12.1.1.f and SC12.1.1.g) Students represent and analyze data collected in an investigation**.** ➢ Example: The student records each room's temperature and compares the two temperatures to determine which is warmer. ➢ Example: The student records the length of each classmate's foot and compares the lengths to determine which foot is longest. • (SC12.1.1.j) Students share the results of their investigations with others. ➢ Example: The student traces the longest foot in the class, takes the student's photograph, and displays them on the bulletin board. ➢ Example: The student and teacher make a bar graph of different classroom temperatures and displays the graph at the school science fair. • (SC12.1.1.k) The student determines if they found an answer to their investigation. ➢ Example: When the teacher asks the student if he found out who has the longest foot and the student indicates that he did. ➢ Example: When asked if she found out which room is warmer, the student says she did.

Nature of Science

Indicator	SC 12.1.2 Students will apply the nature of scientific knowledge to their own investigations and in the evaluation of scientific explanations.	
Extended Indicator	**SCE 12.1.2 Students will apply the nature of science investigations to the world in which they live.**	
	Standards Clarification	• (SC12.1.2.b) Students will recognize how science discoveries impact their lives. ➢ Example: The student takes photographs (or makes a list) of some of the technology (i.e., DVD, TV, motorized wheel chair, assistive technology, electric light) in their classroom that scientists helped develop. • (SC12.1.2.c) Students will recognize that the work of scientists results in changes and advancements in the things they see and use. ➢ Example: The student matches pictures of newer and older versions of common objects (Model T Ford/new sports car, rotary dial telephone/cell phone, propeller plane/jet, stove/microwave).

Technology

Indicator	SC 12.1.3 Students will solve a complex design problem.	
Extended Indicator	**SCE 12.1.3 Students will solve a design problem.**	
	Standards Clarification	• (SC12.1.3.a and SC12.1.3.b) When given a problem, the student will propose several solutions and carry out one of the solutions. ➢ Example: When the teacher asks how they should cook hotdogs for lunch, the student suggests they put it in the microwave. The teacher asks for another method and the student suggests putting it in the oven. The student decides to use the microwave and cooks the hotdog. ➢ Example: The student wants to tell her parent about a new classroom pet. The student makes a list of all the ways they can let the parent know (i.e., e-mail, write a letter, use the telephone, text message them) and decides to telephone the parent. • (SC12.1.3.c) Students will evaluate their selected solution. ➢ Example: When asked how the hotdog tastes the student indicates it was burnt. ➢ Example: The student tells the teacher that her father was excited to see the new hamster in their room. • (SC12.1.3.h) Students will use creativity and imagination to design a new idea to accomplish a designated task. ➢ Example: The student uses Legos to create a car that is both driven and flown to places. ➢ Example: The student draws a picture of a machine that melts the snow off the streets and sidewalks in the winter.

2. Physical Science

K-12 Comprehensive Science Standard – Physical Science

Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.

Matter

Indicator	SC 12.2.1 Students will investigate and describe matter in terms of its structure, composition, and conservation.	
Extended Indicator	**SCE 12.2.1 Students will identify changes that take place between states of matter.**	
	Standards Clarification	• (SC12.2.1.b) Students will identify a solid, a liquid, and a gas. ➢ Example: The student observes boiling water and recognizes that when heated, the water turns to a gas. (liquid to gas) ➢ Example: The student measures ½ cup of water, puts it into a shallow pan, and places the pan in the Sun. Later, the student gets the pan, pours the remaining water back into the ½ cup measuring container, and observes that there isn't as much water. The student determines the water turned into a gas (evaporated). (liquid to gas) ➢ Example: The student identifies that water is a liquid and puts it in the freezer. When turned into ice, the student recognizes that the liquid has turned to a solid. (liquid to solid) ➢ Example: The student places a glass of ice water on the table. After several minutes the student notices the condensation on the outside of the glass. The student identifies that the water that couldn't be seen in the air (gas) has turned to a liquid on the outside of the glass. **Teacher Note:** Students should be familiar with the terms "liquid", "solid", "gas", and "evaporate/evaporation". The term "condensation" is not required knowledge if another term will is more appropriate for student understanding.

Force and Motion

Indicator	SC 12.2.2 Students will investigate and describe the nature of field forces and their interactions with matter.	
Extended Indicator	**SCE 12.2.2 Students will investigate and identify how forces interact with matter.**	
	Standards Clarification	• (SC 12.2.2.a) Students will describe motion with respect to acceleration. ➢ Example: The student recognizes that the faster he runs while pushing a shopping cart, the faster the cart moves. ➢ Example: When racing toy cars across the floor, the student recognizes that if he pushes his car harder, it moves faster.

	➢ Example: When rolling two balls down an incline, the student determines which one went faster and/or slower. • (SC 12.2.2.a) Students will recognize that an object that is not being subjected to a force will continue to move at a constant speed and in a straight line. ➢ Example: When the student rolls a ball down a smooth incline, he observes that it rolls in a straight line. The student places a book in the path of the ball and rolls the ball again. The student observes that when the ball hits the book, it changes course and goes in a different direction. • (SC 12.2.2.b) Students will recognize how the law of inertia (Newton's 1st Law) is evident in a real-world event. ➢ Example: After participating in the above demonstration, the student and teacher discuss the importance of using a seatbelt in a moving car. **Teacher Note:** The term "inertia" is not required knowledge for this standard. However the concept of inertia as it relates to real life experiences is required. Definition of inertia: An object that is not interacting with anything else will continue forever in its state of rest. An object in motion will continue to move in a straight line until another force disrupts that motion.

Energy

Indicator	SC 12.2.3 Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.	
Extended Indicator	**SCE 12.2.3 Students will investigate and recognize the effects of energy transfer.**	
	Standards Clarification	• (SC 12.2.3.b) Students will identify the effect the Sun (light) has on temperature. ➢ Example: After standing in the sunshine for 5 minutes and then moving to the shade for five minutes, the student determines that he felt cooler in the shade because the Sun was not shining on him. ➢ Example: The student compares the temperatures of two outside thermometers (one in direct sunshine and the other in a shady location) and recognizes that the temperature in the sunshine is higher. • (SC 12.2.3.e) Students will identify the difference between a conductor and non-conductor for heat. ➢ Example: After allowing the students to touch "cold" ice water, the teacher places the water into an aluminum thermos and a plastic thermos. Wait a few minutes and allow the students to touch the outside of the thermos. The students will recognize that the plastic thermos is not cold while the aluminum thermos is cold.

	• (SC12.2.3.e) Students will identify that energy transfer affects the changes that take place between states of matter. ➢ Example: The student fills an ice cube tray with water and then determines he must put it in the freezer to turn the water into solid ice cubes. ➢ Example: While eating an ice cream cone, the student recognizes that as the ice cream becomes warm, it melts into a liquid and drips. **Teacher Note:** The term "conductor" and "non-conductor" are not required knowledge for this standard if other terms are more appropriate for student understanding. The concept is required. "Energy transfer affects changes in states of matter" relates to the concept that a solid needs to warm up to change to a liquid and a liquid must cool down to change to a solid.

3. Life Science

K-12 Comprehensive Science Standard – Life Science

Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.

Structure and Function of Living Systems

Indicator	SC 12.3.1 Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells..	
Extended Indicator	**SCE 12.3.1 Students will investigate and identify the factors needed for life and growth.**	
	Standards Clarification	• (SC12.3.1.d) Students will recognize that light is needed for plant growth. ➢ Example: The student compares the growth of a plant growing in a window with the growth of a plant growing under a box and determines the plant in the window grows faster and is greener than the one under the box. • (SC12.3.1.d) Students will recognize that food is needed for plant and animal growth. ➢ Example: After studying about nutrition and eating healthy foods, the student sorts pictures of carrots, chips, apples, grapes, candy bars, nuts, cookies, etc. into two groups: healthy snacks and unhealthy snacks. ➢ Example: After looking at an article on the internet about taking care of pets, the student makes a report on what to feed a dog. • (SC12.3.1.d) Students will recognize that water is needed for plant and animal growth. ➢ Example: The student observes two vases with a flower in each vase. In one vase there is water, the other vase is dry. The student determines that the one flower dies because it lacks water to grow. ➢ Example: The student watches a video about the importance of drinking water to be healthy. She records the number of glasses of water she drinks during a two-day period and determines she needs to drink more water to be healthy.

Heredity

Indicator	SC 12.3.2 Students will describe the molecular basis of reproduction and heredity.	
Extended Indicator	**SCE 12.3.2 Students will investigate and identify features of living organisms that come from their parents.**	
	Standards Clarification	• (SC 12.3.2.c) Students will recognize that mutations may cause changes in offspring that may or may not be desirable characteristics of organisms. ➢ Example: After looking at pictures, the student will recognize that some offspring do not have the protective color of their parent in their fur and/or eyes (albinism). ➢ Example: After picking several clover from a patch of grass, the student counts and determines clover usually have three leaves. The student looks at pictures of four-leaf clover. After picking more clover, the student recognizes that four-leaf clovers are unusual. ➢ Example: The student recognizes that sometimes animals are born with unusual features (e.g., two heads, five legs). **Teacher Note:** The term "mutation" is not required knowledge for this standard.

Flow of Matter and Energy in Ecosystems

Indicator	SC 12.3.3 Students will describe, on a molecular level, the cycling of matter and the flow of energy between organism and their environment.	
Extended Indicator	**SCE 12.3.3 Students will investigate and identify the cycling of matter between organisms and their environment.**	
	Standards Clarification	• (SC 12.3.3.c) Students will recognize the effects limited resources have on a population. ➢ Example: The student studies overpopulation in countries such as India and recognizes that many people lack food and basic needs because there isn't enough for everyone. ➢ Example: The student plants several seeds in a small pot of soil and, after sprouting, recognizes that the seedlings must be thinned in order to provide them with more space and soil in which to grow. • (SC 12.3.3.c) Students will recognize the benefits recycling has on a society. ➢ Example: The student takes pictures of recycled objects that are used in his community (e.g., old tires used as filler in the astroturf on a football field, ballpoint pens made from recycled plastic, greeting cards and notebook paper made from recycled paper, aluminum cans melted and made into new cans).

	➢ Example: The student recycles milk cartons from the lunchroom as containers for planting seedlings. ➢ Example: The student participates in a class clothing drive to gather and donate used clothes to community organizations (Salvation Army, Goodwill, etc.). • (SC12. 3.3.d) Students will recognize factors that influence air quality. ➢ Example: When looking at photographs of smog and other air pollution the student compares them to the air in his community. The student determines which air is better to breathe. ➢ Example: After doing research (picture books, videos, on-line resources) the student determines that cars may cause air pollution and car-pooling or riding a bus is a way to keep our air clean. ➢ Example: After watching a video about smoking and the danger of inhaling second hand smoke, the student makes a poster to encourage others not to smoke. • (SC12. 3.3.d) Students determine that some materials will and some materials will not decompose and influence the environment. ➢ Example: Students dig several holes (at least 6 inches deep) in a permissible place on the school grounds. In each hole the student places one object (e.g., banana peel, apple core, plastic bag, Styrofoam cup, plastic spoon). Each hole is marked and labeled with a craft stick. The student waters each hole every day for about 30 days and then digs up each item. The student determines that the apple core and banana peel rot and go back into the ground. Plastic and Styrofoam will not rot and disappear back into the soil. The student determines that much litter thrown on the ground will not decompose and will only pollute our earth. **Teacher Note:** The student should be familiar with the term "pollution".

Biodiversity

Indicator	SC 12.3.4 Students will describe the theory of biological evolution.	
Extended Indicator	**SCE 12.3.4 Students will explore and identify elements of evolution.**	
	Standards Clarification	• (SC 12.3.4.a) Students will identify features of plants that allow them to be successful in their environment. ➢ Example: While studying plants, the student recognizes that plants have features that help them survive in their environment (e.g., plants living in arid areas have thick/waxy leaves to hold in water, some plants have roots above the ground to help them get water, some plants have big roots that grow deep into the ground to find water, some plants grow very tall to help them get more sunlight). **Teacher Note:** Students should be familiar with the terms "endangered" and "extinct".

4. Earth and Space Science

K-12 Comprehensive Science Standard – Earth and Space Science
Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.

Earth in Space

Indicator	SC 12.4.1 Students will investigate and describe the known universe.	
Extended Indicator	**SCE 12.4.1 Students will identify the difference between man-made and natural objects in space.**	
	Standards Clarification	• (SC12.4.1.a) Students will distinguish between objects in the universe that were created through the Big Bang Theory and objects in the universe that were man-made. ➢ Example: The student reads and watches videos about orbiting space station, rockets, space shuttles, and satellites. ➢ Example: Given pictures of natural and man-made objects in space (e.g., the Moon, space lab, radio satellite, the Sun, stars, weather satellite, space shuttle, planets) the student sorts them into those two categories. **Teacher Note:** The concepts of the Big Bang Theory and the term "Big Bang Theory" are not required for this standard.

Earth Structures and Processes

Indicator	SC 12.4.2 Students will investigate the relationships among Earth's structures, systems, and processes.	
Extended Indicator	**SCE 12.4.2 Students will recognize that various processes cause changes on Earth.**	
	Standards Clarification	• (12.4.2.c) The student will recognize the impact of human activity on Earth's resources (e.g., groundwater, rivers, land, fossil fuels). ➢ Example: During a fieldtrip to a rural area, the student observes the irrigation of crops and determines the water is coming from underground or a nearby river. The student recognizes that people have to be careful not to use up all the groundwater or dry up the rivers. ➢ Example: The student examines a piece of coal and looks at videos and pictures of coal mines. The student recognizes that once humans have used all the coal, it will be gone.

Energy in Earth's Systems

Indicator	SC 12.4.3 Students will investigate and describe the relationships among the sources of energy and their effects on Earth's systems.	
Extended Indicator	**SCE 12.4.3 Students will identify sources of energy in Earth's system.**	
	Standards Clarification	• (SC 12.4.3.c) Students will identify renewable and non-renewable resources. ➢ Example: The student studies fuel sources (e.g., replant trees - wood, replant corn –ethanol, wind – wind turbines, sunshine - solar energy) and recognizes that they are renewable (can be replaced). ➢ Example: The student studies fuel sources (e.g., coal, oil, natural gas) that are non-renewable (cannot be replaced by nature as fast as humans use them). The student determines that people must be careful not to use too much of these fuels so there is none left for other people. ➢ Example: The student flies a kite and determines that the wind is what makes the kite fly. The student recognizes that he can fly the kite all day and again any other day the wind blows because people can't use up all the wind. **Teacher Note:** The student must be familiar with the terms "renewable" and "non-renewable" resources but do not need to know the definitions of the terms. **Non-renewable resources** are described as: resource that take thousands of years to form naturally and cannot be replaced as fast as they are being consumed. **Renewable resources** are described as: practically infinite and cannot be depleted or resources that can be recycled or replanted.

Earth's History

Indicator	SC 12.4.4 Students will explain the history and evolution of Earth.	
Extended Indicator	**SCE 12.4.4 Students will identify changes in Earth over time.**	
	Standards Clarification	• (SC 12.4.4.a) Students will recognize that Earth is composed of layers of sediments and the top layers are newer than the bottom layers. ➢ Example: Looking at pictures of the Grand Canyon, the student recognizes the layers of rocks and indicates the oldest rocks are in the bottom layers and the newest rocks are in the top layer. • (SC 12.4.4.c) Students will recognize that fossils found in the earth tell us about the plants and animals that lived long ago. ➢ Example: The student uses a small paint brush to discover bones and other small items buried in a sand box. ➢ Example: The student observes several pictures of common fossils and determines if they look like plant fossils or animal fossils (e.g., teeth, bones, eggs). ➢ Example: Using clay or plaster of Paris, the student makes fossils (fossilized casts) of small objects (e.g., sea shells, sticks, thumb impressions, coins) by pressing them into the clay, removing them, and observing the impression remaining.