

December 2021

# Nebraska



## **College and Career Ready Science Standards** including the **Extended Indicators**

for  
Students with Significant Disabilities  
who take the  
Statewide Science Alternate Assessment

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# **Nebraska College and Career Ready Science Standards including the Extended Indicators**

## **The Role of Extended Indicators**

For students with the most 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 the most 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 reading and writing. Lists following “e.g.” in the extended indicator are provided only as possible examples.

## **Students with the Most Significant Intellectual Disabilities**

In the United States, approximately 1% of school-aged children have an intellectual disability that is “characterized by significant impairments both in intellectual and adaptive functioning as expressed in conceptual, social, and practical adaptive domains” (U.S. Department of Education, 2002 and American Association of Intellectual and Developmental Disabilities, 2013). These students show evidence of cognitive functioning in the range of severe to profound and need extensive or pervasive support. Students need intensive instruction and/or supports to acquire, maintain and generalize academic and life skills in order to actively participate in school, work, home or community. In addition to significant intellectual disabilities, students may have accompanying communication, motor, sensory, or other impairments.

## **Alternate Assessment Determination Guidelines**

The student taking a Statewide Alternate Assessment is characterized by significant impairments both in intellectual and adaptive functioning which is expressed in conceptual, social, and practical adaptive domains and that originates before age 18 (American Association of Intellectual and Developmental Disabilities, 2013). 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 Statewide 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 cognitive functioning is significantly below age expectations and has an impact on his/her ability to function in multiple environments (school, home and community).**
- **The student’s demonstrated cognitive ability and adaptive functioning prevent completion of the general academic curriculum, even with appropriately designed and implemented modifications and accommodations.**
- **The student’s curriculum and instruction is aligned to the Nebraska College and Career Ready Science Standards with Extended Indicators.**
- **The student may have accompanying communication, motor, sensory, or other impairments.**

The Nebraska Department of Education’s technical assistance documents ***“IEP Team Decision Making Guidelines – Statewide Assessment for Students with Disabilities,” “IEP Team Decision Making Flow Chart – Alternate Assessment”*** and ***“Alternate Assessment Criteria”*** provide additional information on selecting appropriate Statewide assessment for students with disabilities.

## Science – Grade 5 Physical Science

SC.5.3 Structure and Properties of Matter		Access Points		
Standard / Indicator	Extension			
SC.5.3.1 Gather, analyze, and communicate evidence of structure and properties of matter.		A	B	C
<p><b>SC.5.3.1.A Develop a model to describe that matter is made of particles too small to be seen.</b></p> <p>Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.</p>	Participate in investigations to describe that matter is made of particles too small to see without magnification.	Observe models or objects to describe that matter of all sizes and shapes is made of many tiny particles that can be seen only when magnified.	Using real-world objects, identify that the object is made of many smaller parts.	Given a real-world, familiar object, recognize the difference between a part of the object and the object as a whole.
<p><b>SC.5.3.1.B Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.</b></p> <p>Assessment does not include distinguishing mass and weight.</p>	Participate in investigations to demonstrate that heating, cooling, and mixing substances does not change their total weight.	Use data/observation to identify that the weight of a substance before and after it is heated or cooled remains the same, and that the total weight of materials that are mixed together is equal to the weight of the individual parts of the mixture.	Identify that when a solid is melted, it has the same weight, and when a liquid is frozen, it has the same weight.	Recognize that the weight of an object is measured using a scale.
<p><b>SC.5.3.1.C Make observations and measurements to identify materials based on their properties.</b></p> <p>Assessment does not include density or distinguishing mass and weight.</p>	Participate in investigations to identify materials based on physical properties (color, shape, size, texture, weight, temperature) that can be observed or measured.	Given materials, use observable/measurable physical properties to identify the materials or categorize the materials based on common properties.	Given a material, identify two or more physical properties of the material.	Given two materials with opposite physical properties, recognize the material with a specified physical property.

SC.5.3.1.D Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Participate in investigations to determine whether mixing two or more substances results in the formation of a new substance.	Compare the observable properties of two or more substances before and after they are mixed to explain whether a new substance with different properties was formed.	Identify evidence of the formation of a new substance after two or more substances are mixed.	Recognize when two or more substances have been mixed or not mixed.
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## Science – Grade 5 Life Science

SC.5.8 Matter and Energy in Organisms and Ecosystems		Access Points		
Standard / Indicator	Extension	A	B	C
SC.5.8.2 Gather and analyze data to communicate understanding of matter and energy in organisms and ecosystems.				
SC.5.8.2.A Use models to describe that energy in animals' food (used for body repair, growth, and motion and to maintain body warmth) was once energy from the sun.	Explain that energy from food is used for body repair, growth, and motion and to maintain body warmth for both animals and humans.	Describe that energy from food is used by animals and humans for body repair, growth, and motion and to maintain body warmth.	Recognize that animals, including humans, eat food for energy to grow and move.	Recognize that all animals and humans need energy to survive.
SC.5.8.2.B Support an argument that plants get the materials they need for growth chiefly from air and water.	Use evidence to support the claim that plants get materials for growth from air and water.	Use data/observation to explain that plants need air and water to live and grow.	Identify water and air as the two materials plants need to live or grow.	Given an unrelated material and water, recognize that plants need water to live.
SC.5.8.2.C Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. <small>Assessment does not include molecular explanations or the biochemical mechanisms of photosynthesis.</small>	Use information and models to describe the flow of matter among plants and animals.	Given information about three organisms (plants, plant-eating animals, and animal-eating animals), describe the flow of matter between them.	Use a simple food chain to identify the source of food for a given organism.	Given information, recognize that animals depend on other organisms (plants or animals) for food.

## Science – Grade 5 Earth and Space Sciences

<b>SC.5.11. Space Systems: Earth's Stars and Solar System</b>		<b>Access Points</b>		
<b>Standard / Indicator</b>	<b>Extension</b>	<b>A</b>	<b>B</b>	<b>C</b>
<p>SC.5.11.3 Gather and analyze data to communicate understanding of space systems: Earth's stars and solar system.</p>				
<p><b>SC.5.11.3.A Support an argument that the gravitational force exerted by Earth on objects is directed down.</b></p> <p>Assessment does not include mathematical representation of gravitational force.</p>	<p>Use evidence (data and observation) to support the claim that gravity pulls objects on Earth downward.</p>	<p>Use data/observation to describe that objects dropped from a height are pulled toward Earth by gravity.</p>	<p>Use observation to predict that dropped objects are pulled down due to gravity.</p>	<p>Identify the direction that dropped objects will fall (down/toward the ground).</p>
<p><b>SC.5.11.3.B Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.</b></p> <p>Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, and stage).</p>	<p>Use models to explain that the sun appears brighter than other stars because it is much closer to Earth.</p>	<p>Use models to explain that the sun appears brighter than other stars because it is much closer to Earth.</p>	<p>Given a model of the sun and one or more stars, identify which is brightest/closest to Earth.</p>	<p>Given two objects that emit light, recognize which object is brighter.</p>
<p><b>SC.5.11.3.C Represent data in graphical displays to reveal patterns of daily changes in the length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.</b></p> <p>Assessment does not include causes of seasons.</p>	<p>Use data to investigate patterns in the relative location of the sun, the hours of daylight, and the day-and-night cycle.</p>	<p>Use data and observation to describe daily patterns in the sun's location (sunrise, noon, sunset), and seasonal differences in the hours of daylight and darkness.</p>	<p>Identify the relative location of the sun at different times of the day and the relative length of day and night in summer and winter.</p>	<p>Recognize that the sun is present in the local sky during the day but is not present in the local sky at night.</p>

## Science – Grade 5 Earth and Space Sciences

SC.5.13. Earth's Systems		Access Points		
Standard / Indicator	Extension			
SC.5.13.4 Gather and analyze data to communicate understanding of Earth's systems.		A	B	C
<p><b>SC.5.13.4.A</b> Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.</p> <p>Assessment is limited to the interactions of two systems at a time.</p>	Use models of natural Earth processes to identify ways that two systems (geosphere [land], biosphere [organisms], hydrosphere [water], atmosphere [air]) interact, resulting in observable changes.	Given a model of a natural Earth process, identify which two systems interact and one or more changes that are likely to occur.	Given a picture or model of an Earth system, identify one or more parts of that system.	Given a picture or model of an Earth system and two possible parts of that system, recognize a part of the system.
<p><b>SC.5.13.4.B</b> Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.</p> <p>Assessment is limited to oceans, lakes, rivers, glaciers, groundwater, and polar ice caps but does not include the atmosphere.</p>	Use graphs or charts to describe that most water on Earth is saltwater (about 97%) and is found in oceans, while fresh water (about 3%) is found in lakes, rivers, groundwater, and glaciers/ice.	Given a graph or chart, identify which type of water, saltwater or fresh water, is more abundant, and where each type of water is usually found (oceans vs. lakes, rivers, groundwater, glaciers/ice).	Given the location of a body of water (ocean, river, lake), identify whether it contains saltwater or fresh water.	Given a sample or picture of water and two other objects, recognize water.
<p><b>SC.5.13.4.C</b> Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.</p>	Use information about Earth's resources, the environments in which they are found, and ways that resources and environments can be protected or conserved.	Use information about Earth's resources in the student's environment to identify one or more ways that a resource or its source can be conserved (reduce, reuse, recycle).	Given an Earth resource used by the student (e.g., water, electricity, paper, fossil fuels), identify one way to conserve it.	Recognize that Earth resources in the student's environment (e.g., water, metal, wood) are limited.
<p><b>SC.5.13.4.E</b> Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p>	Given a simple and relevant problem or need within the student's community, participate in designing a solution that meets specified criteria and constraints on materials, time, or cost.	Given a simple, relevant problem or need with one or more criteria and constraints, identify tools and/or materials that could be used to design a solution.	Given a common tool or material within the student's environment, identify ways that it can be used to solve a problem.	Given a simple scenario, recognize the function or use of a tool or material.



## Science – Grade 8 Physical Science

SC.8.1 Forces and Interactions		Access Points		
Standard / Indicator	Extension			
SC.8.1.1 Gather, analyze, and communicate evidence of forces and interactions.		A	B	C
<p><b>SC.8.1.1.A Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.</b></p> <p><small>Assessment is limited to vertical or horizontal interactions in one dimension.</small></p>	Participate in investigations to describe the cause-and-effect relationship between two colliding objects.	Participate in guided investigations to describe the relative motions (direction and speed) of two colliding objects.	Identify that the speed and/or direction of one object changes when two objects collide.	Recognize that an object changes direction or speed when a moving object and a stationary object collide.
<p><b>SC.8.1.1.C Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.</b></p> <p><small>Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame and to change in one variable at a time; does not include use of trigonometry.</small></p>	Participate in investigations to explain that a change in the motion of a stationary object depends on the amount of force applied to the object and the mass of the object.	Participate in a guided investigation to explain that an object with a large mass requires more force to move than an object with a smaller mass.	Identify which object requires the least or most force to make it move when given objects of three different masses (small, medium, large).	Recognize there is a difference in force to move a small object versus a large object.
<p><b>SC.8.1.1.D Ask questions about data to determine the factors that affect the strength of electrical and magnetic forces.</b></p> <p><small>Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking.</small></p>	Participate in investigations to describe factors that affect the attraction and/or repulsion of a magnetic or static electric force on an object across a distance.	Participate in a guided investigation to describe how the pull or push of a magnetic or static electric force can be affected by the strength of the magnet or charge, the type of charge (positive/negative), or the distance between an object and the source of the attraction or repulsion.	Use a model to identify that changing the distance between the source of a magnetic or static electric force and an object affects the strength of the pull or push.	Recognize that magnets pull on magnetic objects.

<p>SC.8.1.1.E Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.</p> <p>Assessment does not include Newton's Law of Gravitation or Kepler's Laws.</p>	<p>Use evidence to support the claim that each object on Earth is affected by the force of gravity and that the strength of the force is dependent on the object's mass.</p>	<p>Use evidence to explain that each object on Earth is pulled toward the ground by the force of gravity and that the strength of the pull is dependent on the object's mass.</p>	<p>Identify which of two objects with different masses experiences a stronger pull from gravity.</p>	<p>Recognize that dropped objects fall down/toward the ground.</p>
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## Science – Grade 8 Physical Science

SC.8.2 Waves and Electromagnetic Radiation		Access Points		
Standard / Indicator	Extension			
		A	B	C
<p>SC.8.2.2 Gather, analyze, and communicate evidence of waves and electromagnetic radiation.</p>				
<p>SC.8.2.2.A Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.</p> <p>Assessment does not include electromagnetic waves and is limited to standard repeating waves.</p>	<p>Use models to investigate the relationship between the amplitude of waves and the amount of energy in waves.</p>	<p>Use models to describe the relationship between the amplitude of waves and the energy of waves.</p>	<p>When given the amplitude of two or more waves, identify the wave that is the largest or has the most energy.</p>	<p>Recognize a wave.</p>
<p>SC.8.2.2.B Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.</p> <p>Assessment is limited to qualitative applications pertaining to light and mechanical waves.</p>	<p>Participate in investigations to identify when sound or light waves are reflected, absorbed, or transmitted through different materials.</p>	<p>Participate in a guided investigation to identify whether sound or light waves are reflected, absorbed, or transmitted through different materials.</p>	<p>When given an object or material, identify whether a sound or light wave is transmitted through or reflected by the object or material.</p>	<p>Recognize when light or sound passes through a material.</p>

<p><b>SC.8.2.2.C Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.</b></p> <p>Assessment does not include binary counting. Assessment does not include the specific mechanism of any given device.</p>	<p>Use evidence to support the claim that information can be sent from one place to another using digital or analog signals (waves).</p>	<p>Use evidence to explain that waves (analog or digital signals) can be used to send information across a distance.</p>	<p>Identify familiar forms of analog or digital communication used to send information across a distance.</p>	<p>Recognize a communication device.</p>
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### Science – Grade 8 Physical Science

<b>SC.8.4 Energy</b>		<b>Access Points</b>		
<b>Standard / Indicator</b>	<b>Extension</b>			
SC.8.4.3 Gather, analyze, and communicate evidence of energy.		<b>A</b>	<b>B</b>	<b>C</b>
<p><b>SC.8.4.3.A Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.</b></p>	<p>Use data to describe the relationships between kinetic (motion) energy and the mass and speed of an object.</p>	<p>Use data to describe that the speed and mass of a moving object affect the kinetic energy (motion) of the object.</p>	<p>Use data to identify that an object traveling at a greater speed will have more kinetic energy than an object with the same mass traveling at a slower speed.</p> <p>Use data to identify that an object with a greater mass will have more kinetic energy than an object with less mass that is traveling at the same speed.</p>	<p>Recognize that an object with greater mass or greater speed has more kinetic energy.</p>

<p><b>SC.8.4.3.B Develop a model to describe that when the arrangement of objects interacting at a distance changes, then different amounts of potential energy are stored in the system.</b></p> <p>Assessment is limited to two objects and electric, magnetic, and gravitational interactions.</p>	<p>Use data to describe the relationship between potential (stored) energy and the height of an object.</p>	<p>Use data to describe that the amount of potential (stored) energy in a stationary object increases with increasing height and decreases with decreasing height.</p>	<p>Use data to identify which object has more or less potential energy based on its distance from the bottom of a surface.</p>	<p>Recognize that an object has greater potential energy at a greater height.</p>
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### Science – Grade 8 Life Sciences

<b>SC.8.9 Heredity: Inheritance and Variation of Traits</b>		<b>Access Points</b>		
<b>Standard / Indicator</b>	<b>Extension</b>			
<p>SC.8.9.4 Gather, analyze, and communicate evidence of the inheritance and variation of traits.</p>		<b>A</b>	<b>B</b>	<b>C</b>
<p><b>SC.8.9.4.A Develop and use a model to describe why structural changes to genes (mutations) may result in harmful, beneficial, or neutral effects to structure and function of organisms.</b></p> <p>Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.</p>	<p>Use models to observe that changes in the physical traits of organisms of the same species (caused by genetic mutation) may or may not affect their ability to survive.</p>	<p>Use models to identify changes in the physical traits of individuals of the same species and describe how changes may affect an organism's ability to survive or not.</p>	<p>Using a model of a typical organism and a changed organism of the same species; identify the physical trait that changed or whether the change is helpful or harmful.</p>	<p>Recognize the changed organism when given a model of a typical organism and a changed organism of the same species.</p>
<p><b>SC.8.9.4.B Gather and synthesize information about technologies that have changed the way humans influence inheritance of desired traits in organisms.</b></p>	<p>Use information to describe ways that humans have influenced the physical traits of plants and animals.</p>	<p>Describe physical traits that may be desirable or undesirable and identify a way humans select that trait for future generations of offspring.</p>	<p>Identify which individual would most likely produce offspring with a given desired trait.</p>	<p>Recognize an organism that has a trait that fits a given need.</p>

## Science – Grade 8 Life Sciences

SC.8.10 Natural Selection and Adaptations		Access Points		
Standard / Indicator	Extension	A	B	C
SC.8.10.5 Gather, analyze, and communicate evidence of natural selection and adaptations.				
<p>SC.8.10.5.A Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.</p> <p><small>Assessment does not include the names of individual species or geological eras in the fossil record.</small></p>	Use data and evidence in Earth's fossil record (fossils found in rock or ice layers) to investigate changes in Earth's environments and life forms over time.	Use evidence of the fossil record (types of organisms) to identify that different environments and organisms existed at a given location over time.	Identify one or more fossils that would be found in an environment, or given one or more fossils, identify an environment in which the fossil or fossils could be found.	Recognize a fossil in its environment.
SC.8.10.5.B Apply scientific ideas to construct an explanation for the anatomical similarities and differences among and between modern and fossil organisms to infer evolutionary relationships.	Use models and information about the physical traits of fossilized organisms and modern organisms to investigate the evolutionary relationships between organisms.	Describe one or more similarities or differences that show modern organisms are related to or unrelated to fossilized organisms.	Identify a physical trait of a modern organism that is most similar to a fossilized organism.	Recognize an organism that could have formed a given fossil.

<p>SC.8.10.5.C Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.</p>	<p>Use evidence to identify physical traits of organisms that help them survive and reproduce in a specific environment.</p>	<p>Identify one or more physical traits of an organism or organisms that will be helpful or harmful to the survival and/or reproduction of the organism or organisms in a specific environment.</p>	<p>Identify one or more physical traits that would help organisms survive and reproduce in a specific environment.</p>	<p>Recognize the organism that would best survive in a specific environment.</p>
<p>SC.8.10.5.D Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.</p> <p>Assessment does not include Hardy Weinberg calculations.</p>	<p>Use data to explain that individual organisms with a beneficial physical trait are better able to survive and reproduce than individuals without the trait, which increases the number of individuals with that trait.</p>	<p>Use data to determine whether the number of individuals with or without a specific physical trait will increase or decrease within a population over time.</p>	<p>Identify that the number of individuals with a beneficial physical trait will increase within a population over time.</p>	<p>Recognize whether a given organism has a specific physical trait.</p>

## Science – Grade 8 Earth and Space Sciences

SC.8.11 Space Systems		Access Points		
Standard / Indicator	Extension	A	B	C
SC.8.11.6 Gather, analyze, and communicate evidence of the interactions among bodies in space.				
<p><b>SC.8.11.6.A</b> Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.</p>	Use models of the Earth-sun-moon system to investigate cycles that cause observable monthly lunar patterns and yearly seasonal patterns on Earth.	Use models of the Earth-sun-moon system to observe and describe the cycles that cause the illumination of the moon (new, quarter, half, full), and the seasons (winter, spring, summer, autumn) on Earth.	Identify moon phases (new, half, full) or seasons (winter, spring, summer, autumn) and recognize that they occur in a recurring pattern.	Recognize the moon when it is lit by the sun, or recognize summer and winter as recurring seasons.
<p><b>SC.8.11.6.B</b> Develop and use a model to describe the role of gravity in the motions within the galaxy and the solar system.</p> <p><small>Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of planets as viewed from Earth.</small></p>	Use simple models of the solar system to investigate the motion of the moon around Earth and Earth around the sun due to the pull of gravity.	Use models of the sun, Earth, and the moon to describe that these bodies are kept in predictable orbits by the pull of gravity.	Use a model to identify the sun, Earth, and the moon as parts of the solar system or that they orbit together.	Recognize the sun or Earth as parts of the solar system.
<p><b>SC.8.11.6.C</b> Analyze and interpret data to determine scale properties of objects in the solar system.</p> <p><small>Assessment does not include recalling facts about properties of the planets and other solar system bodies.</small></p>	Use scaled models to compare and describe the size of the sun, planets, and moons in the solar system.	Use scaled models to compare and describe the sizes of the sun, Earth, and the moon.	Use scaled objects or pictures representing the sun, Earth, and the moon to identify which is largest or smallest.	Recognize which of two objects in the Earth-sun-moon system is larger.

## Science – Grade 8 Earth and Space Sciences

SC.8.14 History of Earth		Access Points		
Standard / Indicator	Extension	A	B	C
<p>SC.8.14.7 Gather, analyze, and communicate evidence to explain Earth's history.</p>				
<p><b>SC.8.14.7.A Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.</b></p> <p>Assessment does not include recalling the names of specific periods or epochs and events within them.</p>	<p>Participate in making or using models of Earth's rock strata to explain that rock layers are very old and that their age is relative to their position within rock strata.</p>	<p>Participate in making or using models to explain that Earth's surface is made of rock layers that are very old and that older rock layers are found below younger rock layers.</p>	<p>Identify which layers are the oldest and the youngest when using a model of rock strata with more than two layers.</p>	<p>Recognize the bottom layer as older when using a model of rock strata with two distinct layers.</p>



## Science – Grade 11 Physical Science

SC.HS.1 Forces and Interactions		Access Points		
Standard / Indicator	Extension			
		A	B	C
SC.HS.1.1 Gather, analyze, and communicate evidence of forces and interactions.				
<p>SC.HS.1.1.A <b>Analyze data</b> to support the claim that Newton's Second Law of Motion describes <u>the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.</u></p> <p>Assessment is limited to one dimensional motion and to macroscopic objects moving at non-relativistic speeds.</p>	Use observations to identify the relationship of mass and speed to produce the force of an object.	Use observations to identify the relationship of mass and speed to produce the force of an object.	Identify that mass or force influence speed.	Recognize that an object with a large mass is more difficult to move than an object with a smaller mass.
<p>SC.HS.1.1.B <b>Use mathematical representations</b> to support the claim that the <u>total momentum of a system of objects</u> is conserved when there is no net force on the system.</p> <p>Assessment is limited to systems of two macroscopic bodies moving in one dimension.</p>	Use a model to determine the result of two objects colliding.	Describe the result of two objects with the same mass or with the same speed colliding.	Identify the result of two objects with the same mass but different speeds colliding.	Recognize the result of two objects with the same speed but different masses colliding.
<p>SC.HS.1.1.C <b>Apply science and engineering ideas to design, evaluate, and refine</b> a device that <u>minimizes the force on a macroscopic object during a collision.</u></p> <p>Assessment is limited to qualitative evaluations and/or algebraic manipulations.</p>	Evaluate a design that minimizes a force of an object during a collision.	Use evidence to explain why a design minimizes the force of an object during a collision.	Identify the design that would minimize the force of an object during a collision.	Given the results, recognize the design that minimized the force of an object during a collision.

## Science – Grade 11 Physical Science

SC.HS.3 Structure and Properties of Matter		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.3.3 Gather, analyze, and communicate evidence of the structure, properties, and interactions of matter.				
<p>SC.HS.3.3.B <b>Plan and conduct an investigation</b> to gather evidence to <u>compare the structure</u> of substances at the macro scale to infer the strength of electrical forces between particles.</p> <p>Assessment does not include Raoult's law calculations of vapor pressure.</p>	Use models to compare the spacing of particles in solids, liquids, and gases.	Use a model to determine whether the spacing of particles represents a solid, liquid, or gas.	Identify the relationship between the spacing of particles in a solid or liquid.	Recognize that objects are made of particles.
<p>SC.HS.3.3.D <b>Communicate scientific and technical information</b> about why the molecular-level structure is <u>important in the functioning of designed materials</u>.</p> <p>Assessment is limited to provided molecular structures of specific designed materials.</p>	<p>Identify the differences between metals and nonmetals in allowing heat and energy to pass through.</p> <p>Ensure that SC.5.3.1.C is extended at grade level.</p>	Identify the differences between metals and nonmetals (e.g., fabric, wood, plastic) in allowing heat and energy to pass through.	Recognize that metals allow heat or electricity to pass through.	Recognize a metal from a nonmetal.

## Science – Grade 11 Physical Science

SC.HS.4 Energy		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.4.4 Gather, analyze, and communicate evidence of the interactions of energy.				
<p>SC.HS.4.4.A <b>Create a computational model</b> to <u>calculate the change</u> in the energy of one component in a system when the change in energy of the other component(s) and energy flows <u>in and out of the system</u> are known.</p> <p>Assessment is limited to basic algebraic expressions or computations; to systems of two or three components; and to thermal energy, kinetic energy, and/or the energies in gravitational, magnetic, or electric fields.</p>	Energy can be converted into heat, light, or sound.	Predict whether electrical energy will be converted into heat, light, or sound energy.	Identify examples of electrical energy being converted into heat and/or light energy.	Recognize the evidence that electrical energy was transferred (e.g., light is coming from a bulb, a pan is warm).
<p>SC.HS.4.4.E <b>Plan and conduct an investigation</b> to provide evidence that the transfer of thermal energy when two components of different temperature are combined <u>within a closed system results in a more uniform energy distribution among the components in the system</u> (second law of thermodynamics).</p> <p>Assessment is limited to investigations based on materials and tools provided to students.</p>	Evaluate appropriate methods and/or tools to use in a thermal energy investigation.	Using evidence, explain which object (e.g., thermos, lunch box, paper bag) retains thermal energy for a fixed amount of time.	Identify the tool used to measure a change in thermal energy.	Recognize a tool used to measure thermal energy.

## Science – Grade 11 Physical Science

SC.HS.5 Chemical Reactions		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.5.5 Gather, analyze, and communicate evidence of chemical reactions.				
<p>SC.HS.5.5.C <b>Apply scientific principles</b> and evidence to provide an explanation about the <u>effects of changing the temperature or concentration</u> of the reacting particles on the rate at which a reaction occurs.</p> <p>Assessment is limited to simple reactions in which there are only two reactants; evidence from temperature, concentration, and rate data; and qualitative relationships between rate and temperature.</p>	Describe that a change in a reactant affects the rate at which the reaction occurs.	Identify that changing temperature affects the rate of a reaction.	Identify that an increase in temperature results in a faster reaction (e.g., soak one glow stick in warm water and one glow stick in cold water and then snap the glow sticks and observe the brightness).	Recognize a chemical reaction (e.g., fizzing antacid tablet in water).
<p>SC.HS.5.5.D <b>Refine the design</b> of a chemical system <u>by specifying a change in conditions</u> that would produce increased amounts of products <u>at equilibrium</u>.</p> <p>Assessment is limited to specifying the change in only one variable at a time. Assessment does not include calculating equilibrium constants and concentrations.</p>	Evaluate how changes in the amount of reactants result in an increased amount of product.	Distinguish between multiple models and identify which model results in the greatest amount of product.	Identify that an increase in reactants results in an increase in product.	Recognize an increase in a product.
<p>SC.HS.5.5.E <b>Design a solution</b> to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>	Evaluate an applicable life skill task that requires a solution.	Identify up to three steps, in the correct order, to solve a problem.	Identify one step to solve a problem.	Recognize that a problem exists.

<p><b>SC.HS.5.5.F Use mathematical representations</b> to support the claim that <u>atoms</u>, and therefore <u>mass</u>, are conserved during a chemical reaction.</p> <p>Assessment does not include complex chemical reactions.</p>	<p>Use models to determine that weight does not change during a chemical reaction.</p>	<p>Using numerical data in a graph, identify whether there was a change in weight during a chemical reaction.</p>	<p>Recognize that weight does not change in a chemical reaction.</p>	<p>Recognize that matter has weight.</p>
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## Science – Grade 11 Life Sciences

<b>SC.HS.6 Structure and Function</b>		<b>Access Points</b>		
<b>Standard / Indicator</b>	<b>Extension</b>	<b>A</b>	<b>B</b>	<b>C</b>
<p>SC.HS.6.1 Gather, analyze, and communicate evidence of the relationship between structure and function in living things.</p>		<b>A</b>	<b>B</b>	<b>C</b>
<p><b>SC.HS.6.1.B Develop and use a model</b> to illustrate the hierarchical organization of <u>interacting systems</u> that provide specific functions within multicellular organisms.</p> <p>Assessment does not include interactions and functions at the molecular or chemical reaction level.</p>	<p>Use a model to identify different organs in the human body and describe how they work to support bodily functions.</p> <p>(Assessment Boundary: Limited to either circulatory, respiratory, or digestive systems.)</p>	<p>Identify an organ system and its functions.</p>	<p>Recognize an organ system.</p>	<p>Recognize major human organs.</p>
<p><b>SC.HS.6.1.C Plan and conduct an investigation</b> to provide evidence that <u>feedback mechanisms maintain homeostasis</u>.</p> <p>Assessment does not include the cellular processes involved in the feedback mechanism.</p>	<p>Provide evidence about how an organism will respond when exposed to changing conditions.</p>	<p>Provide evidence about how an organism will respond to changes in its environment (e.g., changes in temperature, varying water levels).</p>	<p>Identify that organisms change in response to their environment.</p>	<p>Recognize that organisms need water when they feel thirsty and food when they feel hungry.</p>

<p>SC.HS.6.1.D <b>Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.</b> Assessment does not include specific gene control mechanisms or rote memorization of the steps of mitosis.</p>	<p>Use a model to explain that the human body is made of many types of cells and that cells divide.</p>	<p>Use a model to explain why cells divide (e.g., to replace dead or damaged cells, to grow, to produce different cell types).</p>	<p>Identify that cells divide through a process.</p>	<p>Recognize that the body is made of cells.</p>
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## Science – Grade 11 Life Sciences

SC.HS.7 Interdependent Relationships in Ecosystems		Access Points		
Standard / Indicator	Extension			
		A	B	C
<p>SC.HS.7.2 Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.</p>				
<p>SC.HS.7.2.C <b>Evaluate the claims, evidence, and reasoning</b> that the <u>interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.</u></p>	<p>Evaluate a claim about living or nonliving factors in an environment and how those factors affect a population.</p>	<p>Predict how an environmental change will influence a population.</p>	<p>Recognize that changes in an environment will cause changes in the number of organisms (plants or animals) in an environment.</p>	<p>Recognize that, to survive, plants and animals need specific factors in an environment.</p>
<p>SC.HS.7.2.D <b>Evaluate the evidence</b> for the <u>role of group behavior on individual and species' chances to survive and reproduce.</u></p>	<p>Describe how individual and group behaviors in species impact the chances for survival and reproduction.</p>	<p>Use evidence to describe how individual and group behaviors affect survival and reproduction.</p>	<p>Recognize individual and group behaviors that help with survival and reproduction.</p>	<p>Recognize individual behaviors that ensure survival and reproduction.</p>

## Science – Grade 11 Life Sciences

SC.HS.8 Matter and Energy in Organisms and Ecosystems		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.8.3 Gather, analyze, and communicate evidence of the flow of energy and cycling of matter in organisms and ecosystems.				
<p>SC.HS.8.3.A <b>Use a model to illustrate how</b> photosynthesis transforms light energy into stored chemical energy.</p> <p>Assessment does not include specific biochemical steps.</p>	<p>Use a model to explain how plants change light energy into chemical energy.</p> <p>Assessment does not include the word photosynthesis.</p>	Use a model to explain how plants change light energy into chemical energy.	Recognize that water, sunlight, and carbon dioxide are used by plants to make food and to grow.	Recognize that plants use the sun to make food.
<p>SC.HS.8.3.C <b>Use a model to illustrate that</b> cellular respiration is a chemical process whereby the bonds of food molecules are broken and bonds in new compounds are formed resulting in a <b>net transfer of energy</b>.</p> <p>Assessment should not include identification of the steps or specific processes involved in cellular respiration.</p>	<p>Use a model to explain that different types of food can be used to produce energy for survival.</p> <p>Note: This does not include the cellular level.</p>	<p>Use a model to explain that different types of foods can be used to produce energy for survival.</p> <p>(Students are not expected to know the molecular structures of sugars, fats, and proteins.)</p>	Recognize that when living things eat, food is broken down and energy is produced.	Recognize that living things need food for survival.
<p>SC.HS.8.3.D <b>Construct and revise an explanation</b> based on evidence for the <b>cycling of matter and flow of energy</b> in aerobic and anaerobic conditions.</p> <p>Assessment does not include the specific chemical processes of either aerobic or anaerobic respiration.</p>	Use models to show the cycling of matter among organisms within an ecosystem.	Use a model to complete a food chain.	Identify the correct order of a simple food chain.	Recognize the correct order in a simple food chain (from producer to consumer).

## Science – Grade 11 Life Sciences

SC.HS.9 Heredity: Inheritance and Variation of Traits		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.9.4 Gather, analyze, and communicate evidence of the inheritance and variation of traits.		<b>A</b>	<b>B</b>	<b>C</b>
<p>SC.HS.9.4.A. <b>Develop and use a model</b> to explain the relationships between the <u>role of DNA and chromosomes in coding the instructions</u> for characteristic traits passed from parents to offspring.</p> <p>Assessment does not include the phases of meiosis or the molecular mechanism of specific steps in the process.</p>	Construct an explanation of how some traits are inherited and some are acquired.	Construct an explanation of how some traits are inherited and some are acquired.	Recognize traits acquired from the environment.	Recognize inherited traits.



## Science – Grade 11 Life Sciences

SC.HS.10 Biological Evolution		Access Points		
Standard / Indicator	Extension			
SC.HS.10.5 Gather, analyze, and communicate evidence of biological evolution.		A	B	C
<p><b>SC.HS.10.5.B Construct an explanation</b> based on evidence that natural selection <u>primarily results from</u> four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.</p> <p>Assessment does not include other mechanisms of evolution, such as genetic drift, gene flow through migration, and co-evolution.</p>	Demonstrate how a population can adapt or change to survive when the environment changes.	Demonstrate how a population can adapt or change to survive when the environment changes.	Given an animal and an environment, identify the traits of that animal that make it best suited for that environment.	Match an animal to its most suitable environment.
<p><b>SC.HS.10.5.E Evaluate the evidence</b> supporting claims that <u>changes</u> in environmental conditions <u>may result in</u>: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.</p>	Use evidence to support a claim of how a change in the environment can cause a change in a population.	Identify environmental conditions that increase or decrease populations in an environment.	Identify conditions that would decrease populations in an environment.	Recognize a healthy population in an environment.

## Science – Grade 11 Earth and Space Sciences

SC.HS.11 Space Systems		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.11.1. Gather, analyze, and communicate evidence to defend that the universe changes over time.		<b>A</b>	<b>B</b>	<b>C</b>
<p>SC.HS.11.1.A <b>Develop a model</b> based on evidence to illustrate the <u>stages</u> of stars, like the sun, and the role of nuclear fusion in the sun’s core to <u>release energy</u> that eventually reaches Earth in the form of radiation.</p> <p>Assessment does not include details of the atomic and sub-atomic processes involved with the sun’s nuclear fusion.</p>	Construct an explanation to describe that the sun is a star and energy from the sun reaches Earth.	Given a model, explain that energy from the sun (a star) reaches Earth in the form of heat and light.	Recognize that light and heat are forms of energy from the sun (a star) that reach Earth.	Recognize that the sun is a star and its light or heat reaches Earth.
<p>SC.HS.11.1.D <b>Use mathematical or computational representations to predict</b> the motion of orbiting objects in the solar system.</p> <p>Mathematical representations for the gravitational attraction of bodies and Kepler’s Laws of orbital motions should not deal with more than two bodies, nor involve calculus.</p>	Use a model to predict the motion of orbiting objects in the solar system.	Recognize that objects in the solar system (e.g., planets, moons, satellites) orbit in predictable patterns.	Recognize that moons orbit planets in patterns while planets orbit the sun in patterns.	Recognize that planets orbit the sun.

## Science – Grade 11 Earth and Space Sciences

SC.HS.12 Weather and Climate		Access Points		
Standard / Indicator	Extension	A	B	C
SC.HS.12.2 Gather, analyze, and communicate evidence to support that Earth's climate and weather are influenced by energy flow through Earth systems.				
<p>SC.HS.12.2.B <b>Use a model</b> to describe how variations in the flow of energy into and out of Earth's systems <u>result in</u> changes in climate.</p> <p>Assessment of the results of changes in climate is limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.</p>	Use a model to describe differences in energy and climate on Earth.	Explain that while Earth orbits around the sun, Earth's tilt/position impacts energy differences between the poles and the equator, producing different climates.	Identify that Earth's position impacts energy differences between the poles and the equator, producing different climates.	Recognize that the sun's energy is different at the poles and at the equator, producing different climates.
<p>SC.HS.12.2.C <b>Analyze geoscience data</b> and the results from global climate models to make an evidence-based forecast of the <u>current rate and scale</u> of global or regional climate changes.</p>	Interpret simple graphs or illustrations to identify trends in global climate over time.	Given graphs or illustrations, identify the patterns of global temperatures and pollution to explain trends.	Given graphs or illustrations, identify the patterns of global temperatures and pollution.	Given a graph or an illustration, recognize the pattern of global temperature.

## Science – Grade 11 Earth and Space Sciences

SC.HS.13 Earth's Systems		Access Points		
Standard / Indicator	Extension			
SC.HS.13.3 Gather, analyze, and communicate evidence to defend the position that Earth's systems are interconnected and impact one another.		<b>A</b>	<b>B</b>	<b>C</b>
SC.HS.13.3.A <b>Analyze geoscience data</b> to make the claim that one change to Earth's surface can <u>create feedbacks</u> that cause changes to other Earth systems.	Explain that atmospheric changes cause changes to Earth's surface. (temperature, water, and wind)	Explain that atmospheric changes cause changes to Earth's surface. (temperature, water and wind)	Recognize that water and wind change the surface of Earth over time.	Recognize that water changes the surface of Earth.
SC.HS.13.3.B <b>Develop a model</b> based on evidence of Earth's interior to describe the <u>cycling of matter</u> .	Use a model to describe Earth's three layers.	Identify that Earth has layers with different characteristics.	Identify that Earth has different layers.	Recognize that Earth has different layers.
SC.HS.13.3.C <b>Construct an argument based on evidence</b> to explain the multiple <u>processes that cause</u> Earth's plates to move.	Describe how the motion of Earth's tectonic plates causes different features or events.	Describe evidence of earthquakes and volcanoes.	Identify that Earth's tectonic plates move, causing earthquakes and volcanoes.	Recognize that Earth's tectonic plates move.
SC.HS.13.3.D <b>Plan and conduct an investigation</b> of <u>the properties of water</u> and their effects on Earth materials, surface processes, and groundwater systems.	Make observations to understand that water's properties impact Earth's materials.	Identify that water can change Earth's materials by freezing or transporting materials.	Recognize that water changes Earth's surface by freezing or transporting materials.	Recognize that water freezes, changing Earth's surface.

## Science – Grade 11 Earth and Space Sciences

SC.HS.15 Sustainability		Access Points		
Standard / Indicator	Extension			
SC.HS.15.5 <b>Gather, analyze, and communicate evidence</b> to describe the interactions between society, environment, and economy.		A	B	C
SC.HS.15.5.A <b>Construct an explanation based on evidence</b> for how the availability of natural resources, occurrence of natural hazards, and <u>changes in climate</u> have influenced human activity.	Construct an explanation of how the availability of natural resources influences human activity. Construct an explanation of how natural hazards influence human activity.	Use evidence to construct an explanation of how the availability of renewable and nonrenewable resources impacts human society. Use evidence to construct an explanation of how natural hazards impact humans.	Identify renewable and nonrenewable resources that impact one's life.  Identify ways natural hazards impact humans.	Recognize that natural resources impact one's life.  Recognize natural hazards.
SC.HS.15.5.D <b>Evaluate or refine a technological solution</b> that increases positive impacts of human activities on <u>natural systems</u> .	Construct an explanation to describe how humans positively and negatively impact Earth.	Explain ways humans positively and negatively impact Earth.	Identify ways humans impact Earth.	Recognize that humans impact Earth.
SC.HS.15.5.E <b>Evaluate a solution to a complex real-world problem</b> based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible <u>social, cultural, and environmental impacts</u> .	Explain how humans can reduce their impact on the environment.	Explain how humans can reduce their impact on the environment.	Identify a solution to reduce human impact on the environment.	Recognize the solution to an environmental problem.