

Nebraska's College and Career Ready Extended Indicators for Science

Grade 11



Nebraska's College and Career Ready Extended Indicators for Science are extensions for students with the most significant cognitive disabilities at grades 5, 8, and 11. Each extended indicator is further extended to three access points, A, B, and C. The access points are intended to provide students with multiple entry points in order to access the grade-level content. The access points are within a continuum of complexity that progresses toward the extended indicator. The less complex access points are represented on the right side of the progression. The access points increase in complexity of knowledge and skills. As the student is being asked to demonstrate more complex understanding of content, the student moves toward the left side of the progression, closer to the extended indicator.

The Nebraska College and Career Ready Extended Indicators and access points should not be used to determine who qualifies to participate on the NSCAS Alternate Assessment. The following resources are available to help the IEP team in making the decision if a student meets the criteria to participate on the NSCAS Alternate Assessment:

- **Most Significant Cognitive Disability Definition**
- <https://cdn.education.ne.gov/wp-content/uploads/2018/03/Most-Significant-Cognitive-Disability-Definition.pdf>
- **IEP Team Decision Making Flow Chart**
- <https://www.education.ne.gov/sped/assessmentlearninginstruction/school-age-nesa-assessments/>
- **IEP Team Decision Making Guidelines for Nebraska Statewide Assessments**
- https://cdn.education.ne.gov/wp-content/uploads/2017/08/IEPTeam_Decision_Making_Guidelines_for_Statewide_Assessments.pdf
- **Alternate Assessment Criteria**
- https://cdn.education.ne.gov/wp-content/uploads/2018/01/Alternate-Assessment-Criteria-Updated-11_29.pdf
- **NSCAS Summative and Alternate Accessibility Manual**
- <https://cdn.education.ne.gov/wp-content/uploads/2019/02/NSCAS-Summative-and-Alternate-Accessibility-Manual-2.8.19.pdf>

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. | | A | B | C |
| SC.HS.1.1.A Analyze data to support the claim that Newton's Second Law of Motion describes <u>the mathematical relationship among</u> the net force on a macroscopic object, its mass, and its acceleration. Assessment is limited to one dimensional motion and to macroscopic objects moving at non-relativistic speeds. | 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. |
| SC.HS.1.1.B Use mathematical representations 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. Assessment is limited to systems of two macroscopic bodies moving in one dimension. | 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. |
| SC.HS.1.1.C Apply science and engineering ideas to design, evaluate, and refine a device that <u>minimizes the force</u> on a macroscopic object during a collision. Assessment is limited to qualitative evaluations and/or algebraic manipulations. | Evaluate a solution that minimizes a force of an object during a collision. | Use evidence to explain why a solution minimizes the force of an object during a collision. | Identify the solution that would minimize the force of an object during a collision. | Given the results, recognize the solution 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 Plan and conduct an investigation 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 Communicate scientific and technical information about why the molecular-level structure is <u>important in the functioning of designed materials</u>. 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 Create a computational model 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. 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 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined <u>within a closed system</u> results in a <u>more uniform energy distribution among the components in the system</u> (second law of thermodynamics). 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 Apply scientific principles 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., Alka-Seltzer in water). |
| <p>SC.HS.5.5.D Refine the design of a chemical system <u>by specifying a change in conditions</u> that would produce increased amounts of products <u>at equilibrium</u>. 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 Design a solution 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>SC.HS.5.5.F Use mathematical representations to support the claim that <u>atoms, and therefore mass, are conserved</u> during a chemical reaction. Assessment does not include complex chemical reactions.</p> | Use models to determine that weight does not change during a chemical reaction. | Using numerical data in a graph, identify whether there was a change in weight during a chemical reaction. | Recognize that weight does not change in a chemical reaction. | Recognize that matter has weight. |

Science – Grade 11 Life Sciences

| SC.HS.6 Structure and Function | | Access Points | | |
|---|--|---|--|--|
| Standard / Indicator | Extension | | | |
| SC.HS.6.1 Gather, analyze, and communicate evidence of the relationship between structure and function in living things. | | A | B | C |
| <p>SC.HS.6.1.B Develop and use a model to illustrate the hierarchical organization of <u>interacting systems</u> that provide specific functions within multicellular organisms. 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 can work together to support bodily functions.</p> <p>(Assessment Boundary: Limited to either circulatory, respiratory, or digestive systems.)</p> | Identify an organ system and its functions. | Recognize an organ system. | Recognize major human organs. |
| <p>SC.HS.6.1.C Plan and conduct an investigation to provide evidence that <u>feedback mechanisms maintain homeostasis</u>. Assessment does not include the cellular processes involved in the feedback mechanism.</p> | Provide evidence about how an organism will respond when exposed to changing conditions. | Provide evidence about how an organism will respond to changes in its environment (e.g., changes in temperature, varying water levels). | Identify that organisms change in response to their environment. | Recognize that organisms need water when they feel thirsty and food when they feel hungry. |
| <p>SC.HS.6.1.D Use a model to <u>illustrate the role</u> of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. Assessment does not include specific gene control mechanisms or rote memorization of the steps of mitosis.</p> | Use a model to explain that the human body is made of many types of cells and that cells divide. | Use a model to explain why cells divide (e.g., to replace dead or damaged cells, to grow, to produce different cell types). | Identify that cells divide through a process. | Recognize that the body is made of cells. |

Science – Grade 11 Life Sciences

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

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. | | | | |
| SC.HS.8.3.A Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. Assessment does not include specific biochemical steps. | Use a model to explain how plants change light energy into chemical energy. Assessment does not include the word photosynthesis. | 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. |
| SC.HS.8.3.C Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules are broken and bonds in new compounds are formed resulting in a <u>net transfer of energy</u> . Assessment should not include identification of the steps or specific processes involved in cellular respiration. | Use a model to explain that different types of food can be used to produce energy for survival. Note: This does not include the cellular level. | Use a model to explain that different types of foods can be used to produce energy for survival. (Students are not expected to know the molecular structures of sugars, fats, and proteins.) | Recognize that when living things eat, food is broken down and energy is produced. | Recognize that living things need food for survival. |
| SC.HS.8.3.D Construct and revise an explanation based on evidence for the <u>cycling of matter and flow of energy</u> in aerobic and anaerobic conditions. Assessment does not include the specific chemical processes of either aerobic or anaerobic respiration. | 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 | | | |
| SC.HS.9.4 Gather, analyze, and communicate evidence of the inheritance and variation of traits. | | A | B | C |
| <p>SC.HS.9.4.A. Develop and use a model 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. |

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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. | | | | |
| SC.HS.11.1.A Develop a model 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. Assessment does not include details of the atomic and sub-atomic processes involved with the sun's nuclear fusion. | 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 UV rays, 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. |
| SC.HS.11.1.D Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. 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. | 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. | | | | |
| SC.HS.12.2.B Use a model to describe how variations in the flow of energy into and out of Earth's systems <u>result in changes in climate</u> . 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. | 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. |
| SC.HS.12.2.C Analyze geoscience data 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. | Interpret simple graphs to identify trends in global climate over time. | Given graphs, identify the patterns of global temperatures and pollution to predict future trends. | Given graphs, identify the patterns of global temperatures and pollution. | Given a graph, 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. | | A | B | C |
| SC.HS.13.3.A Analyze geoscience data 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 Develop a model 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 Construct an argument based on evidence to explain the multiple <u>processes</u> that cause Earth's plates to move. | Describe how the motion of Earth's plates causes different features or events. | Describe evidence of earthquakes and volcanoes. | Identify that Earth's plates move, causing earthquakes and volcanoes. | Recognize that Earth's plates move. |
| SC.HS.13.3.D Plan and conduct an investigation of the <u>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, dissolving 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 | | | |
| | | A | B | C |
| SC.HS.15.5 Gather, analyze, and communicate evidence to describe the interactions between society, environment, and economy. | | | | |
| SC.HS.15.5.A Construct an explanation based on evidence 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 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 Evaluate or refine a technological solution 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 Evaluate a solution to a complex real-world problem 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. |