Proficiency Scales

Earth Science

High School

2020

SOUTHWESTERN UNION

EDUCATION

PROFICIENCY SCALES

Proficiency scales serve as a starting point for unit planning, creating assessments, delivering instruction, grading, and reporting progress, as well as making teaching visible to students and guiding their growth on the standards. Specifically, a proficiency scale is a continuum or learning progression that articulates distinct levels of knowledge and skills relative to specific standards. It shows teachers and students what proficiency looks like, what knowledge and skills students need to achieve proficiency, and how students might go beyond proficiency.

A proficiency scale is composed of a series of levels as follows:

Score 3.0—Heart of the proficiency scale; it defines the target content that teachers expect all students to know and be able to do. I CAN statements are provided for this level.

Score 2.0—Simpler content; it describes the foundational knowledge and skills that students will need to master before progressing to proficiency.

Score 4.0—Challenging content; it provides students the opportunity to go above and beyond expectations by applying their knowledge in new situations or demonstrating understanding beyond what the teacher teaches in class. A generic statement is provided for this level.

Scores 1.0 and 0.0—No specific content; 1.0 indicates that a student can demonstrate some knowledge or skill with help from the teacher, but not independently; 0.0 means that, even with help, a student cannot show any understanding. Generic statements are provided for these levels.

Half-point Scores—More precise measurement of knowledge and skills that is between two levels. Generic statements are provided for these levels.

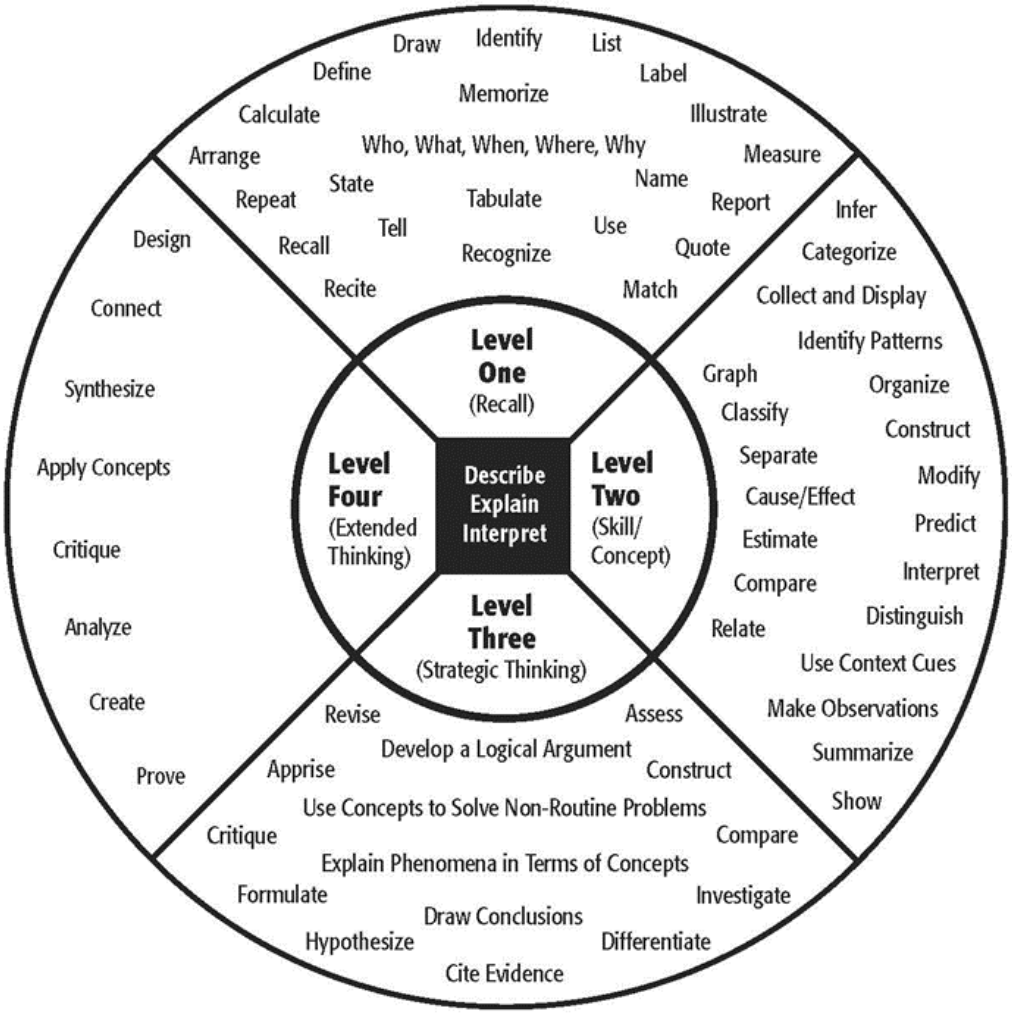
Proficiency scales become the centerpiece of communication and understanding in the classroom, as well as the common language for discussing learning between teacher and student.

The proficiency scales are organized according to the domains and strands in the NAD standards.

The cognitive rigor or complexity of the 3.0 learning targets has also been included, for it impacts the selection of instructional activities as well as assessment tasks. The Depth of Knowledge (DOK) model is generally used for this purpose, which is a taxonomy of four levels of cognitive demand. The levels are:

- **Level 1**—Recall
- **Level 2**—Skill/Concept
- **Level 3**—Strategic Thinking
- **Level 4**—Extended Thinking

Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/ solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	Apply mathematical model to illuminate a problem or situation.
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Analyze and synthesize information from multiple sources.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Describe and illustrate how common themes are found across texts from different cultures.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Design a mathematical model to inform and solve a practical or abstract situation.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	
	Organize, represent and interpret data.		

Webb, Norman L. and others. "Web Alignment Tool" 24 July 2005. Wisconsin Center of Educational Research. University of Wisconsin-Madison. 2 Feb. 2006. <http://www.wcer.wisc.edu/WAT/index.aspx>.

Science and Engineering Practices

1. Asking and Defining Problems
2. Developing and Using Models
3. Using Mathematics and Computational Thinking
4. Planning and Carrying Out Investigations
5. Constructing Explanations and Designing Solutions
6. Obtaining, Evaluating, and Communicating Information
7. Analyzing and Interpreting Data
8. Engaging in Argument From Evidence

Southwestern Union Conference
Secondary Science Committee

Amy Abernathy — North Dallas Adventist Academy
Larry Camp — Sandia View Academy
Jon Dickerson — Chisholm Trail Academy
Robert Fetters — Ozark Adventist Academy
Pablo Gonzalez — Houston Adventist Academy
David Pena — South Texas Christian Academy

Title: **The Solar System**		Subject: **Earth Science**
Standard:		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: **HS-ESS1-4 Use mathematical or computational representations to predict the motion of orbiting objects in the solar system** (for example, apply mathematical or computational representations for the gravitational attraction of bodies and the Newtonian gravitational laws of orbital motions to predict the motion of orbiting objects—such as human-made satellites, planets and moons—in the solar system).	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	**HS-ESS1-4** The student will: • Recognize or recall specific vocabulary (for example, *attraction, gravitational, moon, motion, Newtonian gravitational laws, orbit, orbital motion, planet, predict, revolution, rotation, satellite, solar system, space probe*). • Describe how objects orbit around other objects. • Describe the key parts of Newton's gravitational laws of orbital motions.	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

<table>
<tr><td colspan="3">Title: The Universe and Stars Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun’s core to release energy in the form of radiation (for example, use evidence—such as observations of the masses and lifetimes of other stars as well as the ways that the sun’s radiation varies due to sudden solar flares, the eleven-year sunspot cycle, and non-cyclic variations over centuries –to create a model that illustrates the energy transfer mechanisms that allow energy from nuclear fusion in the sun’s core to reach Earth).

HS-ESS1-2 Construct an explanation of how a model of recent creation could correlate with the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe (for example, explain and critique the Big Bang theory using astronomical evidence, such as the red shift of light from galaxies as an indication that the universe is currently expanding, the cosmic microwave background as the remnant radiation from the Big Bang, and the observed composition—three-fourths hydrogen and one-fourth helium—of ordinary matter found in stars and interstellar gases matching that predicted by the Big Bang theory, the time frames of the creation of the universe and of life in Gen. 1:1 and 1:2 may have been at separate moments, the Big Bang could imply an expansion of space and time).

HS-ESS1-3 Communicate scientific ideas about the way stars, over their life cycle, produce elements (for example, use speech, graphs, text, and mathematics to communicate scientific ideas about the way nucleosynthesis, and therefore, the creation of different elements, varies as a function of the mass of a star and its life stage).</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
</table>

<table>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS1-1 The student will:

• Recognize or recall specific vocabulary (for example, energy, life span, lifetime, mass, non-cyclic, nuclear fusion, radiation, release, solar flare, star, sun’s core, sun’s radiation, sunspot cycle, transfer, variation).
• Describe how a star’s radiation varies over the life span of the star.
• Describe how the process of nuclear fusion in the sun’s core creates energy.
• Describe how energy from the sun reaches Earth.

HS-ESS1-2 The student will:

• Recognize or recall specific vocabulary (for example, supposed age of the universe, astronomical, Big Bang theory, composition, composition of the universe, cosmic microwave background, evidence for the Big Bang theory, evidence for the expansion of the universe, expand, galaxy, gas, helium, history of the universe, hydrogen, interstellar, light year, matter, motion, origin of the universe, radiation, red shift, remnant, solar system formation, spectrum, star, stellar, universe).
• Summarize the Big Bang theory.
• Describe Biblical and scientific evidence that supports or does not support the Big Bang theory.

HS-ESS1-3 The student will:

• Recognize or recall specific vocabulary (for example, element, function, life cycle, life stage, mass, nucleosynthesis, star, star composition, star destruction, star formation, star size, star temperature, star type).
• Describe how the process of nucleosynthesis creates different elements.
• Describe how the process of nucleosynthesis varies due to the mass of the star and its life stage.</td></tr>
<tr><td></td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
<tr><td></td><td>Score 0.5</td><td>With help, partial success at score 2.0 content but not at score 3.0 content</td></tr>
<tr><td>Score 0.0</td><td colspan="2">Even with help, no success</td></tr>
</table>

<table>
<tr><td colspan="3">Title: Weather and Climate Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

HS-ESS2-4 Use a model based to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate (for example, use a model to explain how changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution are caused by variation in the flow of energy into and out of Earth systems, and explain that these changes differ by timescale, ranging from changes that occur over the period of a decade to changes that occur over Earth’s history).

Use a model based on a Biblical worldview to interpret the geological history of the Earth. (for example, major catastrophes such as the Flood altered the conditions on Earth. Changes that would normally require long periods of time may have happened rapidly in a very short time period. Uniformitarianism does not hold true in all cases.)</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS2-4 The student will:

• Recognize or recall specific vocabulary (for example, biosphere, catastrophism, circulation, climate change, distribution, Earth system, energy, flow, glacial, ice volume orbit, orientation, pattern, precipitation, sea level, solar output, surface temperature, timescale, uniformitarianism, variation, volcanic eruption).
• Describe the flow of energy into and out of Earth systems.
• Describe the relationship between energy in Earth systems and changes in climate.
• Describe how changes in climate may occur over different lengths of time.
• Describe how catastrophism can affect climate (for example, volcanism, floods, Earthquakes, meteor strikes)</td></tr>
</table>

	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

<table>
<tr><td colspan="3">Title: Water and Earth's Surface Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

HS-ESS2-5 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes (for example, use water and a variety of solid materials to plan and conduct a mechanical investigation (such as on stream transportation and deposition using a stream table, on erosion using variations in soil moisture content, or on frost wedging by the expansion of water as it freezes) or a chemical investigation (such as on chemical weathering and recrystallization by testing the solubility of different materials or on melt generation by examining how water lowers the melting temperature of most solids) to provide evidence for connections between the hydrologic cycle and system interactions commonly known as the rock cycle).</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS2-5 The student will:

• Recognize or recall specific vocabulary (for example, advection, chemical, deposition, Earth material, erosion, expansion, frost wedging, hydrologic cycle, interaction, mechanical, melt generation, moisture, property, recrystallization, rock cycle, solubility, stream table, surface process, system, transportation, weathering, wedge).
• Describe how the properties of water affect Earth materials.
• Describe the relationship between the hydrologic cycle and the rock cycle.</td></tr>
<tr><td></td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
</table>

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

<table>
<tr><td colspan="3">Title: Earth's History Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

Contrast the evolutionary and Biblical model of the origins of the solar system (for example, the evidence of meteorite impacts as seen on the surfaces of the Earth, moon, and other planetary surfaces and how it relates to the history of the Earth.)

Analyze the reliability, methodology, and assumptions, of radiometric dating. (for example, half-life of radioactive decay, the unknown original parent/daughter isotope ratios, the effects of catastrophism on radiometric decay, inconsistency of data measurements, and absolute dating vs. relative dating.)</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS1-6 The student will:

• Recognize or recall specific vocabulary (for example, absolute dating, accuracy, ancient, circular reasoning, composition, daughter isotopes, Earth material, Earth's formation, history, impact cratering, meteorite, mineral, moon rock, parent isotopes, planetary, precision, radiometric dating, record, relative dating, solar system, surface).
• Recognize that carbon-14 dating is not used to date the age of the Earth.</td></tr>
<tr><td></td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
<tr><td></td><td>Score 0.5</td><td>With help, partial success at score 2.0 content but not at score 3.0 content</td></tr>
</table>

Score 0.0	Even with help, no success

<table>
<tr><td colspan="3">Title: Plate Tectonics Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

Compare and contrast the past and current movements of continental and oceanic crust and the theory of plate tectonics (for example, how the flood or other catastrophes could alter the rate of plate movements, review evidence of the ages of oceanic crust increasing with distance from mid-ocean ridges (a result of plate spreading) and the relative ages of North American continental crust increasing with distance away from a central ancient core (a result of past plate interactions) to evaluate the ability of plate tectonics to explain the relative ages of crustal rocks).

HS-ESS2-3 Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection (for example, uses maps of Earth’s three-dimensional structure—obtained from seismic waves, records of the rate of change of Earth’s magnetic field, and identification of composition of Earth’s layers from high-pressure laboratory experiments—to create both a one-dimensional model of Earth with radial layers determined by density and a three-dimensional model, which is controlled by mantle convection and the resulting plate tectonics).</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS1-5 The student will:

• Recognize or recall specific vocabulary (for example, age, Alfred Wegener, ancient core, continental crust, crustal deformation, crustal plate movement, crustal rock, interaction, mid-ocean ridge, mountain building, ocean layer, oceanic crust, plate, plate boundary, plate collision, plate spreading, plate tectonics, sea-floor spreading, theory).
• Describe the theory of plate tectonics.
• Describe the relationship between movements of Earth’s crust and the relative ages of crustal rock.</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">HS-ESS2-3 The student will:

• Recognize or recall specific vocabulary (for example, composition, cycle, density, Earth’s layers, interior, magnetic field, mantle, mantle convection, matter, one-dimensional, plate tectonics, pressure, radial, rate, seismic wave, thermal, three-dimensional).
• Describe the structure of the Earth’s interior.
• Describe how matter cycles by thermal convection.</td></tr>
<tr><td></td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
<tr><td></td><td>Score 0.5</td><td>With help, partial success at score 2.0 content but not at score 3.0 content</td></tr>
<tr><td>Score 0.0</td><td colspan="2">Even with help, no success</td></tr>
</table>

<table>
<tr><td colspan="3">Title: Earth Systems Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

HS-ESS2-1 Develop a model to illustrate how Earth’s internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features (for example, create a model that shows how the appearance of land features (such as mountains, valleys, and plateaus) and ocean-floor features (such as trenches, ridges, and seamounts) are a result of both constructive forces (such as volcanism, tectonic uplift, and orogeny) and destructive mechanisms (such as weathering, mass wasting, and coastal erosion)).

HS-ESS2-2 Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth systems (for example, analyze data to claim that one change to Earth’s surface can crate feedbacks that change other Earth systems, including climate feedbacks (such as how an increase in greenhouse gases causes a rise in global temperatures that melts glacial ice which reduces the amount of sunlight reflected from Earth’s surface, increasing surface temperatures and further reducing the amount of ice) and system interactions (such as how the loss of ground vegetation causes an increase in water runoff and soil erosion, how the loss of wetlands causes a decrease in local humidity that further reduces the wetland extent, or how dammed rivers increase groundwater recharge, decrease sediment transport, and increase coastal erosion)).</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
</table>

<table>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS2-1 The student will:

• Recognize or recall specific vocabulary (for example, coastal erosion, constructive, continental, destructive, feature, force, geologic time, geologic time scale, geological dating, internal process, mass wasting, mechanism, molten rock, mountain, ocean floor, ocean layer, orogeny, plateau, ridge, seamount, spatial scale, surface process, tectonic uplift, temporal scale, trench, valley, volcanism, weathering).
• Describe how different land and ocean-floor features form.
• Describe how constructive and destructive forces work to form land and ocean-floor features.

HS-ESS2-2 The student will:

• Recognize or recall specific vocabulary (for example, atmospheric change, climate, coastal, Earth system, erosion, feedback, feedback effect, glacial ice, global, greenhouse gas, groundwater recharge, humidity, interaction, runoff, sediment, surface, system, temperature, transport, vegetation, wetland).
• Describe how changes to the Earth’s surface result in changes to other Earth systems.</td></tr>
<tr><td></td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
<tr><td></td><td>Score 0.5</td><td>With help, partial success at score 2.0 content but not at score 3.0 content</td></tr>
<tr><td>Score 0.0</td><td colspan="2">Even with help, no success</td></tr>
</table>

<table>
<tr><td colspan="3">Title: Humans and Earth Systems Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced negative human activity (for example, use evidence to explain how the availability of natural resources (such as high concentrations of minerals or fossil fuels and access to fresh water and regions of fertile soils), natural hazards (from interior processes such as volcanic eruptions and Earthquakes, surface processes such as tsunamis and soil erosion, and severe weather such as hurricanes, floods, and droughts), and climate change (such as changes to sea level and regional patterns of temperature and precipitation) have influenced human activity).

HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems (for example, use scientific ideas and principles; logical arguments about economic, societal, environmental, and ethical factors; and empirical data on the impacts of human activities (such as the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use) to evaluate or refine a technological solution that reduces the impact of human activities on natural systems; for instance, examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean)).

Investigate global climate models and how it may impact Earth’s future. (for example, Is the current rate of global warming exponential, linear, or fluctuating?, How much do human beings or natural causes contribute to global warming?, Is global warming necessarily bad?)</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
</table>

<table>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS3-1 The student will:

• Recognize or recall specific vocabulary (for example, availability climate, concentration, drought, Earthquake, erosion, fertile, flood, fossil fuel, fresh water, human activity, hurricane, influence, interior process, mass migration, mineral, natural hazard, natural resource, population, precipitation, regional, river delta, sea level, severe weather, surface process, temperature, tsunami, volcanic eruption).
• Describe the relationship between the availability of natural resources, natural hazards, and change in climate and human activity.

HS-ESS3-4 The student will:

• Recognize or recall specific vocabulary (for example, areal, atmosphere, biomass, climate change, diversity, economic factor, empirical data, environmental factor, ethical factor, geoengineering, global warming, human activity (anthropogenic), impact, natural system, ozone, pollutant, recycle, resource, reuse, sea level, societal factor, species).
• Summarize a technological solution for reducing the impact of human activities.
• Summarize the impacts of human activity on natural systems.</td></tr>
<tr><td></td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
<tr><td></td><td>Score 0.5</td><td>With help, partial success at score 2.0 content but not at score 3.0 content</td></tr>
<tr><td>Score 0.0</td><td colspan="2">Even with help, no success</td></tr>
</table>

<table>
<tr><td colspan="3">Title: Natural Resources Subject: Earth Science</td></tr>
<tr><td colspan="3">Standard:</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:

HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios (for example, use cost-benefit ratios to evaluate competing design solution, and develop best practices for agricultural soil use; coal, tar sand, and oil shale mining; or petroleum and natural gas extraction in order to maximize the conservation, recycling, and reuse of resources—such as minerals and metals—when possible and to minimize impacts when it is not).

HS-ESS3-3 Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations and biodiversity (for example, create a computational simulation and use it to describe the factors that affect the management of natural resources (such as costs of resource extraction and waste management per-capita consumption, and the development of new technologies) and the factors that affect human sustainability and biodiversity (such as agricultural efficiency, levels of conservation, and urban planning)).</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">HS-ESS3-2 The student will:

• Recognize or recall specific vocabulary (for example, agricultural, conservation, cost-benefit ratio, develop, energy resource, extraction, harvesting of resources, impact, manage, metal, mineral, mineral resource, minimize, mining, natural gas, oil shale, petroleum, recycle, resource, reuse, soil use, tar sand, utilize).
• Summarize competing design solutions for developing, managing, and utilizing energy and mineral resources.
• Describe the process of using cost-benefit ratios to evaluate design solutions.
HS-ESS3-3 The student will:</td></tr>
</table>

	• Recognize or recall specific vocabulary (for example, *agricultural biodiversity conservation, consumption, efficiency extraction, management, natural resource, per-capita, population, resource, sustainability, urban planning, and waste management*). • Describe the relationship between natural resources, human populations, and biodiversity.	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

Title: **Carbon Cycle**		Subject: **Earth Science**
Standard:		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: **HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere** (for example, create a quantitative model of a biogeochemical cycle that includes the cycling of carbon through the ocean, atmosphere, soil, and biosphere—including humans—and use it to explain how carbon provides the foundation for all living organisms).	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	**HS-ESS2-6** The student will: • Recognize or recall specific vocabulary (for example, *atmosphere, biogeochemical, biosphere, carbon, carbon cycle, Earth system, geosphere, hydrosphere, organism*). • Describe how carbon cycles through the hydrosphere, atmosphere, geosphere, and biosphere. • Describe the relationship between carbon and living organisms.	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	