Nebraska Science

HS Earth and Space Sciences

Space Systems SC.HS.11

1 **Gather, analyze, and communicate evidence to defend that the universe changes over time.** SC.HS11.1

- a Use a model based on evidence to illustrate how the stages of stars and the role of nuclear fusion in a star's core releases energy that reaches Earth in the form of radiation. SC.HS11.1.A
- b Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. SC.HS11.1.B
- c Communicate scientific ideas about the way stars, throughout their stellar stages, produce elements. SC.HS11.1.C
- d Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. SC.HS11.1.D

Weather and Climate SC.HS12

2 **Gather, analyze, and communicate evidence to support that Earth's climate and weather are influenced by energy flow through Earth systems.** SC.HS12.2

- a Construct an explanation based on evidence for how the sun's energy moves among Earth's systems. SC.HS12.2.A
- b Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. SC.HS12.2.B
- c Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate and scale of global or regional climate changes. SC.HS12.2.C
- d Evaluate the validity and reliability of past and present models of Earth conditions to make projections of future climate trends and their impacts. SC.HS12.2.D

Earth's Systems SC.HS13

3 **Gather, analyze, and communicate evidence to defend the position that Earth's systems are interconnected and impact one another.** SC.HS13.3

- a Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. SC.HS13.3.A
- b Develop a model based on evidence of Earth's interior to describe the cycling of matter. SC.HS13.3.B
- c Construct an argument based on evidence to explain the multiple processes that cause Earth's plates to move. SC.HS13.3.C
- d Plan and conduct an investigation of the properties of water and their effects on Earth materials, surface processes, and groundwater systems. SC.HS13.3.D

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e Develop a quantitative model to describe the cycling of carbon and other nutrients among the hydrosphere, atmosphere, geosphere, and biosphere, today and in the geological past. SC.HS13.3.E

History of Earth SC.HS14

4 Gather, analyze, and communicate evidence to interpret Earth's history. SC.HS14.4

a Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the differences in age, structure, and composition of crustal and sedimentary rocks. SC.HS14.4.A

b Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to reconstruct Earth's formation and early history. SC.HS14.4.B

c Develop a model to illustrate how Earth's internal and surface processes operate over time to form, modify, and recycle continental and ocean floor features. SC.HS14.4.C

d Construct an argument based on evidence to validate coevolution of Earth's systems and life on Earth. SC.HS14.4.D

Sustainability SC.HS15

5 Gather, analyze, and communicate evidence to describe the interactions between society, environment, and economy. SC.HS15.5

a Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. SC.HS15.5.A

b Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. SC.HS15.5.B

c Use a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. SC.HS15.5.C

d Evaluate or refine a technological solution that increases positive impacts of human activities on natural systems. SC.HS15.5.D

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 social, cultural, and environmental impacts. SC.HS15.5.E

f Use a computational representation to illustrate the relationships among Earth systems and the degree to which those relationships are being modified due to human activity. SC.HS15.5.F