Nebraska Science

Grade 7

Structure and Properties of Matter SC.7.3

1 **Gather, analyze, and communicate evidence of the structure, properties, and interactions of matter.** SC.7.3.1

- a Develop models to describe the atomic composition of simple molecules. SC.7.3.1.A
- b Gather and make sense of information to describe how natural materials may undergo chemical reactions to create new synthetic materials and have an impact on society. SC.7.3.1.B
- c Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. SC.7.3.1.C

Chemical Reactions SC.7.5

2 **Gather, analyze, and communicate evidence of chemical reactions.** SC.7.5.2

- a Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. SC.7.5.2.A
- b Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. SC.7.5.2.B
- c Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. SC.7.5.2.C
- d Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. SC.7.5.2.D

Interdependent Relationships in Ecosystems SC.7.7

3 **Gather, analyze, and communicate evidence of interdependent relationships in ecosystems.** SC.7.7.3

- a Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. SC.7.7.3.A
- b Develop and use a model to describe how stable ecosystems maintain biodiversity and ecosystem services. SC.7.7.3.B
- c Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. SC.7.7.3.C
- d Apply scientific principles to design a method for monitoring and increasing positive human impact on the environment. SC.7.7.3.D

Matter and Energy in Organisms and Ecosystems SC.7.8

4 **Gather, analyze, and communicate evidence of the flow of energy and cycling of matter in organisms and ecosystems.** SC.7.8.4

- a Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. SC.7.8.4.A
- b Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as matter moves through an organism. SC.7.8.4.B
- c Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. SC.7.8.4.C
- d Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. SC.7.8.4.D
- e Construct an argument supported by evidence that changes to physical or biological components of an ecosystem affect populations. SC.7.8.4.E

Earth's Systems SC.7.13

5 **Gather, analyze, and communicate evidence of the flow of energy and cycling of matter associated with Earth's materials and processes.** SC.7.13.5

- a Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. SC.7.13.5.A
- b Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. SC.7.13.5.B
- c Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. SC.7.13.5.C

History of Earth SC.7.14

6 **Gather, analyze, and communicate evidence to explain Earth's history.** SC.7.14.6

- a Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. SC.7.14.6.A
- b Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions. SC.7.14.6.B
- c Analyze and interpret data on geologic hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. SC.7.14.6.C