Nebraska Science

Plus Standards: Chemistry

Structure and Properties of Matter SC.HSP.3

1 Gather, analyze, and communicate evidence of the structure, properties, and interactions of matter. SC.HSP.3.1

- a Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. SC.HSP.3.1.A
- b Plan and conduct an investigation to gather evidence to compare the structure of substances at the macro scale to infer the strength of electrical forces between particles. SC.HSP.3.1.B
- c Develop and use models to predict and explain forces that are in and between molecules. SC.HSP.3.1.C
- d 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.HSP.3.1.D
- e Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay. SC.HSP.3.1.E
- f Develop and use models to describe and predict mechanisms of the quantum mechanical model of the atom. SC.HSP.3.1.F
- g Evaluate the evidence supporting claims about how atoms absorb and emit energy in the form of electromagnetic radiation. SC.HSP.3.1.G
- h Use mathematical representations to quantify matter through the analysis of patterns in chemical compounds at different scales. SC.HSP.3.1.H

Energy: Chemistry SC.HSP.4

2 Gather, analyze, and communicate evidence of the interactions of energy. SC.HSP.4.2

- a Use statistical and mathematical techniques to describe qualitative and quantitative thermodynamic relationships. SC.HSP.4.2.A
- b Plan and conduct an investigation to gather evidence of how the Kinetic Molecular Theory and gas laws are related. SC.HSP.4.2.B
- c Analyze and interpret data to explain changes in energy within a system and/or energy flows in and out of a system. SC.HSP.4.2.C
- d Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. SC.HSP.4.2.D

Chemical Reactions SC.HSP.5

3 **Gather, analyze, and communicate evidence of chemical reactions.** SC.HSP.5.3

- a Plan and conduct an investigation to generate evidence that answers scientific questions related to changes in solution chemistry. SC.HSP.5.3.A
- b Use a model to identify electron transfer and balance a redox reaction. SC.HSP.5.3.B
- c Use mathematical and/or computational representations to predict and explain relationships within chemical systems. SC.HSP.5.3.C
- d Use mathematical representations to analyze the proportion and quantity of particles in solution. SC.HSP.5.3.D
- e Plan and conduct an investigation to predict the outcome of a chemical reaction based on patterns of chemical properties. SC.HSP.5.3.E
- f Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. SC.HSP.5.3.F