

# 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
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## 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
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**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