

# Integrated Chemistry & Physics: Grades 9, 10, 11, 12

Adopted 2023

## Matter and its Interactions

**HS-ICP1-1.** 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. [HS-ICP1-1](#)

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**HS-ICP1-2.** 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. [HS-ICP1-2](#)

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**HS-ICP1-3.** Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. [HS-ICP1-3](#)

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**HS-ICP1-4.** Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. [HS-ICP1-4](#)

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**HS-ICP1-5.** 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. [HS-ICP1-5](#)

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## Forces

**HS-ICP2-1.** Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. [HS-ICP2-1](#)

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## Energy

**HS-ICP3-1.** Quantitatively analyze various scenarios to describe how the change of energy in one component in a system responds to the change in energy of the other components and flow of energy into and out of the system are known. [HS-ICP3-1](#)

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**HS-ICP3-2.** Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles (objects). [HS-ICP3-2](#)

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**HS-ICP3-3.** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. [HS-ICP3-3](#)

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**HS-ICP3-4.** Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. [HS-ICP3-4](#)

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**HS-ICP3-5.** Gather data to build a model to describe and explain the flow of current through series and parallel electric circuits. [HS-ICP3-5](#)

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**Waves and their  
Applications in  
Technologies for  
Information Transfer**

**HS-ICP4-1.** Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves. [HS-ICP4-1](#)