

# Chemistry

## Matter and its Interactions

- 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 and the composition of the nucleus of atoms. [HS-PS1-1](#)

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- 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-PS1-2](#)

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- 3 Plan and conduct an investigation to gather evidence to compare the structure of substances at the macroscale to infer the strength of electrical forces between particles. [HS-PS1-3](#)

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- 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-PS1-4](#)

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- 5 Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. [HS-PS1-5](#)

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- 6 Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. [HS-PS1-6](#)

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- 7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [HS-PS1-7](#)

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- 8 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-PS1-8](#)

## Motion and Stability: Forces and Interactions

- 6 Communicate scientific and technical information about why the atomic-level, subatomic-level, and/or molecular level structure is important in the functioning of designed materials. [HS-PS2-6](#)

## Energy

- 1 Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. [HS-PS3-1](#)

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- 3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. [HS-PS3-3](#)

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**4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).** HS-PS3-4

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**6 Evaluate the validity and reliability of claims in published materials about the viability of nuclear power as a source of alternative energy relative to other forms of energy (e.g., fossil fuels, wind, solar, geothermal).** HS-PS3-6