# Science: Chemistry

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| MATTER AND ITS INTERACTIONS | 1a | Identify the periodic table as a model to use to predict the properties of elements. LC-HS-PS1-1A |
| | 1b | Identify that the periodic table was created based on the patterns of electrons in the outermost energy level of atoms. LC-HS-PS1-1B |
| | 1c | Identify that the number of electrons in the outermost energy level of atoms impacts the behavior of the element. LC-HS-PS1-1C |
| | 1d | Identify the periodic table as a model that predicts the number of electrons and other subatomic particles. LC-HS-PS1-1D |
| | 2a | Identify an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms. LC-HS-PS1-2A |
| | 2b | Identify an explanation for the outcome of a simple chemical reaction based on trends in the periodic table. LC-HS-PS1-2B |
| | 2c | Construct an explanation for the outcome of a simple chemical reaction based on the chemical properties of the elements involved. LC-HS-PS1-2C |
| | 3a | Identify bulk properties of substances (i.e., melting point, boiling point, and surface tension). LC-HS-PS1-3A |
| | 3b | Identify that electrical forces within and between atoms can keep particles close together. LC-HS-PS1-3B |
| | 3c | Conduct an experiment to gather evidence of the strength of electrical forces between particles. LC-HS-PS1-3C |
| | 4a | Determine whether energy is released or absorbed in a chemical reaction system using various types of models (e.g., drawings, graphs, etc.). LC-HS-PS1-4A |
| MATTER AND ITS INTERACTIONS | 5a | Identify the effects of changing the temperature of the reacting particles at the rate at which a simple reaction (i.e., two reactants) occurs using a model (e.g., a table of data) of the number and energy of collisions between particles. LC-HS-PS1-5A |

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| | **5b** Identify the effects of changing the concentration of the reacting particles at the rate at which a simple reaction (i.e., two reactants) occurs using a model (e.g., a table of data) of the number and energy of collisions between particles. LC-HS-PS1-5B |
| | **6a** Identify a change in one variable (i.e., temperature, concentration, pressure) of a chemical equation that would produce increased amounts of products at equilibrium. LC-HS-PS1-6A |
| | **7a** Identify a chemical equation, and identify the reactants and products which support the claim that matter (i.e., atoms) is neither created or destroyed in a chemical reaction. LC-HS-PS1-7A |
| | **7b** Identify a mathematical representation (e.g., table, graph) or pictorial depictions that illustrates the claim that mass is conserved during a chemical reaction. LC-HS-PS1-7B |
| | **8a** Identify models that illustrate nuclear processes (i.e., fusion, fission, and radioactive decays), involve the release or absorption of energy. LC-HS-PS1-8A |
| | **8b** Contrast changes during the processes of alpha, beta, or gamma radioactive decay using graphs or pictorial depictions of the composition of the nucleus of the atom and the energy released. LC-HS-PS1-8B |
| **MOTION AND STABILITY: FORCES AND INTERACTIONS** | **6a** Communicate that different materials have different molecular structures and properties which determine different functioning of the material (e.g., flexible, but durable). LC-HS-PS2-6A |
| **ENERGY** | **1a** Identify a model showing the change in the energy of one component in a system compared to the change in energy of another component in the system. LC-HS-PS3-1A |
| | **1b** Identify a model showing the change in 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. LC-HS-PS3-1B |
| | **3a** Identify the forms of energy that will be converted by a device that converts one form of energy into another form of energy. LC-HS-PS3-3A |
| | **3b** Identify steps in a model of a device showing the transformations of energy that occur (e.g., solar cells, solar ovens, generators, turbines). LC-HS-PS3-3B |
| | **3c** Describe constraints to the design of the device which converts one form of energy into another form of energy (e.g., cost or efficiency of energy conversion). LC-HS-PS3-3C |
| | **4a** Identify the temperatures of two liquids of different temperature before mixing and after combining to show uniform energy distribution. LC-HS-PS3-4A |

**4b** **Investigate the transfer of thermal energy when two substances are combined within a closed system.** LC-HS-PS3-4B

**6a** **Identify the relationship between increasing energy demand and the technologies developed to meet these needs.** LC-HS-PS3-6A

**6b** **Identify an alternative energy system with minimal social and environmental consequences.** LC-HS-PS3-6B

**6c** **Evaluate a claim about nuclear energy as an alternative source of energy as opposed to other forms of energy.** LC-HS-PS3-6C