Physical Science MATTER AND ITS INTERACTIONS	
Louisiana Student Standards	**Louisiana Connectors (LC)**
HS-PS1-1 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.	**LC-HS-PS1-1a** Identify the periodic table as a model to use to predict the properties of elements.
	LC-HS-PS1-1b Identify that the periodic table was created based on the patterns of electrons in the outermost energy level of atoms.
	LC-HS-PS1-1c Identify that the number of electrons in the outermost energy level of atoms impacts the behavior of the element.
	LC-HS-PS1-1d Identify the periodic table as a model that predicts the number of electrons and other subatomic particles.
HS-PS1-2 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.	**LC-HS-PS1-2a** Identify an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms.
	LC-HS-PS1-2b Identify an explanation for the outcome of a simple chemical reaction based on trends in the periodic table.
	LC-HS-PS1-2c Construct an explanation for the outcome of a simple chemical reaction based on the chemical properties of the elements involved.
HS-PS1-7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	**LC-HS-PS1-7a** Identify a chemical equation and the reactants and products which support the claim that matter (i.e., atoms) is neither created or destroyed in a chemical reaction.
	LC-HS-PS1-7b Identify a mathematical representation (e.g., table, graph) or pictorial depictions that illustrates the claim that mass is conserved during a chemical reaction.
HS-PS1-8 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.	**LC-HS-PS1-8a** Identify models that illustrate nuclear processes (i.e., fusion, fission, and radioactive decays), involve the release or absorption of energy.
	LC-HS-PS1-8b 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.

Physical Science MOTION AND STABILITY: FORCES AND INTERACTIONS	
Louisiana Student Standards	**Louisiana Connectors (LC)**
HS-PS2-1 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.	**LC-HS-PS2-1a** Predict changes in the motion of a macroscopic object, such as a falling object, an object rolling down a ramp, or a moving object being pulled by a constant force using data (e.g., tables or graphs of position or velocity as a function of time for an object subject to a net unbalanced force).
HS-PS2-2 Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	**LC-HS-PS2-2a** Identify an example of the law of conservation of momentum (e.g., in a collision, the momentum change of an object is equal to and opposite of the momentum change of the other object) represented using graphical or visual displays (e.g., pictures, pictographs, drawings, written observations, tables, charts).
HS-PS2-3 Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.	**LC-HS-PS2-3a** Evaluate a device (e.g., football helmet or a parachute) designed to minimize force by comparing data (i.e., momentum, mass, velocity, force, or time).
HS-PS2-5 Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	**LC-HS-PS2-5a** Identify situations and provide evidence where an electric current is producing a magnetic field.
	LC-HS-PS2-5b Identify situations and provide evidence where a magnetic field is producing an electric current.

Physical Science ENERGY	
Louisiana Student Standards	**Louisiana Connectors (LC)**
HS-PS3-2 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.	**LC-HS-PS3-2a** Identify that two factors, an object's mass and height above the ground, affect gravitational potential energy (i.e., energy stored due to position of an object above Earth) at the macroscopic level.
	LC-HS-PS3-2b Identify that the mass of an object and its speed determine the amount of kinetic energy the object possesses.
HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	**LC-HS-PS3-3a** 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-PS3-3b 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-PS3-3c 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).
HS-PS3-4 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).	**LC-HS-PS3-4a** Identify the temperatures of two liquids of different temperature before mixing and after combining to show uniform energy distribution.
	LC-HS-PS3-4b Investigate the transfer of thermal energy when two substances are combined within a closed system.
HS-PS3-5 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.	**LC-HS-PS3-5a** Use a model to identify the cause and effect relationships between forces produced by electric or magnetic fields and the change of energy of the objects in the system.

Physical Science WAVES AND THEIR APPLICATIONS	
Louisiana Student Standards	**Louisiana Connectors (LC)**
HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	**LC-HS-PS4-1a** Qualitatively describe cause and effect relationships between changes in wave speed and type of media through which the wave travels using mathematical and graphical representations.
	LC-HS-PS4-1b Identify examples that illustrate the relationship between the frequency and wavelength of a wave.
	LC-HS-PS4-1c Identify evidence that the speed of a wave depends on the media through which it travels.
PS4-4 Evaluate the validity and reliability of claims in published materials regarding the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	**LC-PS4-4a** Recognize the relationship between the damage to living tissue from electromagnetic radiation and the energy of the radiation.