Physical Science	
2010 Standards	**2016 Standards**
7.1.1 Explain that when energy is transferred from one system to another, the total quantity of energy does not change.	**7.PS.3** Investigate the Law of Conservation of Mass by measuring and comparing the mass of a substance before and after a change of state.
7.1.2 Describe and give examples of how energy can be transferred from place to place and transformed from one form to another through radiation, convection and conduction.	**7.PS.8** Investigate a process in which energy is transferred from one form to another and provide evidence that the total amount of energy does not change during the transfer when the system is closed. (Law of conservation of energy) **7.PS.9** Compare and contrast the three types of heat transfer: radiation, convection, and conduction.
7.1.3 Recognize and explain how different ways of obtaining, transforming and distributing energy have different environmental consequences.	
7.1.4 Recognize and provide evidence of how light, sound and other waves have energy and how they interact with different materials.	
7.1.5 Describe and investigate how forces between objects—such as magnetic, electrical or gravitational forces—can act at a distance or by means of direct contact between objects.	
7.1.6 Explain that forces have magnitude and direction and those forces can be added to determine the net force acting on an object.	
7.1.7 Demonstrate and describe how an object's speed or direction of motion changes when a force acts upon it. Demonstrate and describe that an object's speed and direction of motion remain unchanged if the net force acting upon it is zero.	
	7.PS.1 Draw, construct models, or use animations to differentiate between atoms, elements, molecules, and compounds.

	7.PS.2 Describe the properties of solids, liquids, and gases. Develop models that predict and describe changes in particle motion, density, temperature, and state of a pure substance when thermal energy is added or removed.
	7.PS.4 Investigate Newton's first law of motion (Law of Inertia) and how different forces (gravity, friction, push and pull) affect the velocity of an object.
	7.PS.5 Investigate Newton's second law of motion to show the relationship among force, mass and acceleration.
	7.PS.6 Investigate Newton's third law of motion to show the relationship between action and reaction forces.
	7.PS.7 Construct a device that uses one or more of Newton's laws of motion. Explain how motion, acceleration, force, and mass are affecting the device.

Earth and Space Science	
2010 Standards	**2016 Standards**
7.2.1 Describe how the earth is a layered structure composed of lithospheric plates, a mantle and a dense core.	**7.ESS.3** Using simulations or demonstrations, explain continental drift theory and how lithospheric (tectonic) plates have been and still are in constant motion resulting in the creation of landforms on the Earth's surface over time.
7.2.2 Recognize that the earth possesses a magnetic field that is detectable at the surface with a compass.	**7.ESS.5** Construct a model, diagram, or scale drawing of the interior layers of the Earth. Identify and compare the compositional (chemical) layers to the mechanical (physical) layers of the Earth's interior including magnetic properties.

7.2.3 Characterize the immensity of geologic time and recognize that it is measured in eras and epochs.	**7.ESS.2** Construct a model or scale drawing (digitally or on paper), based on evidence from rock strata and fossil records, for how the geologic time scale is used to organize Earth's 4.6 billion-year-old history.
7.2.4 Explain how convection currents in the mantle cause lithospheric plates to move and cause fast changes like earthquakes and volcanic eruptions and slow changes like the creation of mountains and formation of new ocean floors.	**7.ESS.3** Using simulations or demonstrations, explain continental drift theory and how lithospheric (tectonic) plates have been and still are in constant motion resulting in the creation of landforms on the Earth's surface over time.
7.2.5 Describe the origin and physical properties of igneous, metamorphic and sedimentary rocks and how they are related through the rock cycle.	**7.ESS.1** Identify and investigate the properties of minerals. Identify and classify a variety of rocks based on physical characteristics from their origin, and explain how they are related using the rock cycle. (i.e. Sedimentary, igneous, and metamorphic rocks)
7.2.6 Describe physical and chemical characteristics of soil layers and how they are influenced by the process of soil formation (including the action of bacteria, fungi, insects and other organisms).	**7.ESS.5** Construct a model, diagram, or scale drawing of the interior layers of the Earth. Identify and compare the compositional (chemical) layers to the mechanical (physical) layers of the Earth's interior including magnetic properties.
7.2.7 Use geological features such as karst topography and glaciation to explain how largescale physical processes have shaped the land.	**7.ESS.4** Construct an explanation, based on evidence found in and around Indiana, for how large scale physical processes, such as Karst topography and glaciation, have shaped the land.
7.2.8 Compare and contrast fossils with living organisms in a given location to explain how earth processes have changed environments over time.	**7.ESS.2** Construct a model or scale drawing (digitally or on paper), based on evidence from rock strata and fossil records, for how the geologic time scale is used to organize Earth's 4.6 billion-year-old history.
	7.ESS.6 Research common synthetic materials (i.e. plastics, composites, polyester, and alloys) to gain an understanding that synthetic materials do come from natural resources and have an impact on society.

	7.ESS.7 Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana. Determine which energy resources are the most beneficial and efficient.

Life Science	
2010 Standards	**2016 Standards**
7.3.1 Explain that all living organisms are composed of one cell or multiple cells and that the many functions needed to sustain life are carried out within cells.	**7.LS.1** Investigate and observe cells in living organisms and collect evidence showing that living things are made of cells. Compare and provide examples of prokaryotic and eukaryotic organisms. Identify the characteristics of living things.
7.3.2 Understand that water is a major component within all cells and is required to carry out many cellular functions.	
7.3.3 Explain that, although the way cells function is similar in all living organisms, multicellular organisms have specialized cells whose specialized functions are directly related to their structure.	
7.3.4 Compare and contrast similarities and differences among specialized sub cellular components within plant and animal cells (including organelles and cell walls that perform essential functions and give cells shape and structure).	**7.LS.5** Compare and contrast the form and function of the organelles found in plant and animal cells.
7.3.5 Explain that cells in multicellular organisms repeatedly divide to make more cells for growth and repair.	**7.LS.2** Create a model to show how the cells in multicellular organisms repeatedly divide to make more cells for growth and repair as a result of mitosis. Explain how mitosis is related to cancer.

7.3.6 Explain that after fertilization a small cluster of cells divides to form the basic tissues of an embryo and further develops into all the specialized tissues and organs within a multicellular organism.	**7.LS.3** Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms.
7.3.7 Describe how various organs and tissues serve the needs of cells for nutrient and oxygen delivery and waste removal.	**7.LS.4** Research and describe the functions and relationships between various cell types, tissues, and organs in the immune system, circulatory system and digestive system of the human body.

Science, Engineering, and Technology	
2010 Standards	**2016 Standards**
7.4.1 Understand that energy is the capacity to do work.	
7.4.2 Explain that energy can be used to do work using many processes (e.g., generation of electricity by harnessing wind energy).	
7.4.3 Explain that power is the rate that energy is converted from one form to another.	
7.4.4 Explain that power systems are used to provide propulsion for engineered products and systems.	

Engineering	
2010 Standards	**2016 Standards**
	6-8.E.1 Identify the criteria and constraints of a design to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
	6-8.E.2 Evaluate competing design solutions using a systematic process to identify how well they meet the criteria and constraints of the problem.

	6-8.E.3 Analyze data from investigations to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
	6-8.E.4 Develop a prototype to generate data for repeated investigations and modify a proposed object, tool, or process such that an optimal design can be achieved.