

Seventh Grade NGSS to 2016 IAS Correlation Guide

Physical Science	
Next Generation Science Standards	2016 Indiana Academic Standards
MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.	7.PS.1 Draw, construct models, or use animations to differentiate between atoms, elements, molecules, and compounds.
MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	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.
MS-PS1-5 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	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.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.
MS-PS2-1 Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.	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.
	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)

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	<p>7.PS.9 Compare and contrast the three types of heat transfer: radiation, convection, and conduction.</p>
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Earth and Space Science	
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	<p>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)</p>
<p>MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history.</p> <p>MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.</p>	<p>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.</p>
<p>MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history.</p> <p>MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.</p>	<p>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.</p>
<p>MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.</p>	<p>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.</p>
	<p>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.</p>

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<p>MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.</p>	<p>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.</p>
	<p>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.</p>

Life Science	
Next Generation Science Standards	2016 Indiana Academic Standards
<p>MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p>	<p>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.</p>
	<p>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.</p>
<p>MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.</p>	<p>7.LS.3 Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms.</p>
	<p>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.</p>
<p>MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.</p>	<p>7.LS.5 Compare and contrast the form and function of the organelles found in plant and animal cells.</p>

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Engineering	
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6-8.E.1 Define the criteria and constraints of a design problem with sufficient precision 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.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 determine how well they meet the criteria and constraints of the problem.	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 tests 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.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 model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	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.