

## Physical Science:

GRADE 6	GRADE 7	GRADE 8
<p><b>6.PS.1.a.1:</b> Distinguish between the terms position, distance, and displacement, as well as, the terms speed and velocity.</p>	<p><b>7.PS.1.a.1:</b> Draw, construct models, or use animations to differentiate between atoms, elements, molecules, and compounds.</p>	<p><b>8.PS.1.a.1:</b> Create models to represent the arrangement and charges of subatomic particles in an atom (protons, neutrons and electrons).</p> <p><b>8.PS.1.a.2:</b> Understand the significance that the currently 118 known chemical elements combine to form all the matter in the universe.</p>
<p><b>6.PS.2.a.1:</b> Describe the motion of an object graphically showing the relationship between time and position.</p>	<p><b>7.PS.2.a.1:</b> Describe the properties of solids, liquids, and gases.</p> <p><b>7.PS.2.a.2:</b> 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.</p>	<p><b>8.PS.2.a.1:</b> Illustrate how atoms are arranged in simple molecules. Distinguish between atoms, elements, molecules, and compounds.</p>
<p><b>6.PS.3.a.1:</b> Describe how potential and kinetic energy can be transferred from one form to another.</p>	<p><b>7.PS.3.a.1:</b> Investigate the Law of Conservation of Mass by measuring and comparing the mass of a substance before and after a change of state.</p>	<p><b>8.PS.3.a.1:</b> Use basic information provided for an element (atomic mass, atomic number, symbol, and name) to determine its place on the Periodic Table.</p> <p><b>8.PS.3.a.2:</b> Use this information to find the number of protons, neutrons, and electrons in an atom.</p>
<p><b>6.PS.4.a.1:</b> Investigate the properties of light, sound, and other energy waves and how they are reflected, absorbed, and transmitted through materials and space.</p>	<p><b>7.PS.4.a.1:</b> 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.</p>	<p><b>8.PS.4.a.1:</b> Identify organizational patterns (radius, atomic number, atomic mass, properties and radioactivity) on the Periodic Table.</p>
	<p><b>7.PS.5.a.1:</b> Investigate Newton's second law of motion to show the relationship among force, mass and acceleration.</p>	<p><b>8.PS.5.a.1:</b> Investigate the property of density and provide evidence that properties, such as density, do not change for a pure substance.</p>

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	<p><b>7.PS.6.a.1:</b> Investigate Newton’s third law of motion to show the relationship between action and reaction forces.</p>	<p><b>8.PS.6.a.1:</b> Compare and contrast physical change vs. chemical change.</p> <p><b>8.PS.6.a.2:</b> Analyze the properties of substances before and after substances interact to determine if a chemical reaction has occurred.</p>
	<p><b>7.PS.7.a.1:</b> Construct a device that uses one or more of Newton’s laws of motion.</p> <p><b>7.PS.7.a.2:</b> Explain how motion, acceleration, force, and mass are affecting the device.</p>	<p><b>8.PS.7.a.1:</b> Balance chemical equations to show how the total number of atoms for each element does not change in chemical reactions and as a result, mass is always conserved in a closed system. (Law of Conservation of Mass)</p>
	<p><b>7.PS.8.a.1:</b> 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)</p>	
	<p><b>7.PS.9.a.1:</b> Compare and contrast the three types of heat transfer: radiation, convection, and conduction.</p>	

## Earth and Space Science:

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<p><b>6.ESS.1.a.1:</b> Describe the role of gravity and inertia in maintaining the regular and predictable motion of celestial bodies.</p>	<p><b>7.ESS.1.a.1:</b> Identify and investigate the properties of minerals.</p> <p><b>7.ESS.1.a.2:</b> 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><b>8.ESS.1.a.1:</b> Research global temperatures over the past century.</p> <p><b>8.ESS.1.a.2:</b> Compare and contrast data in relation to the theory of climate change.</p>
<p><b>6.ESS.2.a.1:</b> Demonstrate how Earth's rotation, revolution, tilt, and interaction with the sun and moon cause seasons, tides, changes in daylight hours, eclipses, and phases of the moon.</p>	<p><b>7.ESS.2.a.1:</b> 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><b>8.ESS.2.a.1:</b> Create a diagram or carry out a simulation to describe how water is cycled through the earth's crust, atmosphere and oceans. Explain how the water cycle is driven by energy from the sun and the force of gravity.</p>
<p><b>6.ESS.3.a.1:</b> Compare and contrast the Earth, its moon, and other planets in the solar system, including comets and asteroids. (Comparisons should be made in regard to size, surface features, atmospheric characteristics, and the ability to support life.)</p>	<p><b>7.ESS.3.a.1:</b> 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><b>8.ESS.3.a.1:</b> Research how human consumption of finite natural resources (i.e. coal, oil, natural gas, and clean water) and human activities have had an impact on the environment (i.e. causes of air, water, soil, light, and noise pollution).</p>
	<p><b>7.ESS.4.a.1:</b> 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><b>7.ESS.5.a.1:</b> 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><b>7.ESS.6.a.1:</b> 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><b>7.ESS.7.a.1:</b> Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana.</p>	

## Life Science:

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<p><b>6.LS.1.a.1:</b> Investigate and describe how homeostasis is maintained as living things seek out their basic needs of food, water, shelter, space, and air.</p>	<p><b>7.LS.1.a.1:</b> Identify the characteristics of living things.</p> <p><b>7.LS.1.a.2:</b> Investigate and observe cells in living organisms and collect evidence showing that living things are made of cells.</p> <p><b>7.LS.1.a.3:</b> Compare and provide examples of prokaryotic and eukaryotic organisms.</p>	<p><b>8.LS.1.a.1:</b> Compare and contrast the transmission of genetic information in sexual and asexual reproduction.</p> <p><b>8.LS.1.a.2:</b> Research organisms that undergo sexual and asexual reproduction.</p>
<p><b>6.LS.2.a.1:</b> Describe the role of photosynthesis in the flow of energy in food chains, energy pyramids, and food webs.</p>	<p><b>7.LS.2.a.1:</b> 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.</p> <p><b>7.LS.2.a.2:</b> Explain how mitosis is related to cancer.</p>	<p><b>8.LS.2.a.1:</b> Demonstrate how genetic information is transmitted from parent to offspring through chromosomes via the process of meiosis. Explain how living things grow and develop.</p>
<p><b>6.LS.3.a.1:</b> Describe specific relationships (predator/prey, consumer/producer, parasite/host) and symbiotic relationships between organisms.</p>	<p><b>7.LS.3.a.1:</b> Explain how cells develop through differentiation into specialized tissues and organs in multicellular organisms.</p>	<p><b>8.LS.3.a.1:</b> Create and analyze Punnett squares to calculate the probability of specific traits being passed from parents to offspring using different patterns of inheritance.</p>
<p><b>6.LS.4.a.1:</b> Investigate how changes in biotic and abiotic components in a given habitat can be beneficial or detrimental to native and animals.</p>	<p><b>7.LS.4.a.1:</b> 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><b>8.LS.4.a.1:</b> Differentiate between acquired traits and genetically inherited traits.</p> <p><b>8.LS.4.a.2:</b> Provide examples of acquired traits and genetically inherited traits.</p>
	<p><b>7.LS.5.a.1:</b> Compare and contrast the form and function of the organelles found in plant cells.</p> <p><b>7.LS.5.a.2:</b> Compare and contrast the form and function of the organelles found in animal cells.</p>	<p><b>8.LS.5.a.1:</b> Explain how factors affecting natural selection (competition, genetic variations, environmental changes, and overproduction) increase or decrease a species' ability to survive and reproduce.</p>

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		<p><b>8.LS.6.a.1:</b> Create models to show how the structures of chromatin, chromosomes, chromatids, genes, alleles and deoxyribonucleic acid (DNA) molecules are related and differ.</p>
		<p><b>8.LS.7.a.1:</b> Recognize organisms are classified into taxonomic levels according to shared characteristics. Explain how an organism's scientific name correlates to these shared characteristics.</p>
		<p><b>8.LS.8.a.1:</b> Explore and predict the evolutionary relationships between species looking at the anatomical differences among modern organisms and fossil organisms.</p>
		<p><b>8.LS.9.a.1:</b> Examine traits of individuals within a species that may give them an advantage or disadvantage to survive and reproduce in stable or changing environment.</p>
		<p><b>8.LS.10.a.1:</b> Gather and synthesize information about how humans alter organisms genetically through a variety of methods.</p>
		<p><b>8.LS.11.a.1:</b> Investigate how viruses and bacteria affect the human body.</p>

## Engineering:

GRADE 6	GRADE 7	GRADE 8
<p><b>6-8.E.1.a.1:</b> 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.</p>	<p><b>6-8.E.1.a.1:</b> 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.</p>	<p><b>6-8.E.1.a.1:</b> 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.</p>