

**Fifth Grade
2016 Science Standards Resource Guide**

Physical Science				
2016 Indiana Academic Standards	Clarifying Statements	Vocabulary	Crosscutting Concept	Disciplinary Core Idea
5.PS.1 Describe and measure the volume and mass of a sample of a given material.		volume – amount of space that a substance or object occupies mass – amount of matter in an object	Energy and Matter	PS1.A: Structure and Properties of Matter

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<p>5.PS.2 Demonstrate that regardless of how parts of an object are assembled the mass of the whole object is identical to the sum of the mass of the parts; however, the volume can differ from the sum of the volumes. (Law of Conservation of Mass)</p>	<p>(1) Identify that solids, liquids, and gases all have mass. (2) Examine how matter can combine and be separated in various ways. (3) Examine and model what mass, volume, temperature, and density represent. (4) Examine how mass is summative when multiple samples are mixed together (sand and salt) (5) Examine chemical changes involving gases and seems to “lose” mass (ex: why it seems like mass vanishes when wood burns, where does the mass really go?) (6) Examine changes in temperature with gases, mass remains constant and volume changes. (7) Whatever matter we start with, we end with. Matter cannot be created or destroyed, just change arrangement and the space between.</p>		<p>Energy and Matter</p>	<p>PS1.A: Structure and Properties of Matter</p> <p>PS1. B: Chemical Reactions</p>
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<p>5.PS.3 Determine if matter has been added or lost by comparing mass when melting, freezing, or dissolving a sample of a substance. (Law of Conservation of Mass)</p>	<p>(1) Define matter vs mass (2) Define melting, freezing, and dissolving samples and how that looks at the particle level. (3) Examine the definitions of density, mass, temperature, and volume. (4) Model that matter is made of tiny particles that can rearrange and move, but are not lost nor destroyed. (5) Examine what changes at the particle level when melting, freezing, etc.</p>	<p>-Conservation -Mass</p>	<p>Energy and Matter</p>	<p>PS1.A: Structure and Properties of Matter PS1. B: Chemical Reactions</p>
<p>5.PS.4 Describe the difference between weight being dependent on gravity and mass comprised of the amount of matter in a given substance or material.</p>		<p>-Weight -Scale -Mass -Balance -Gravity</p>	<p>Energy and Matter</p>	<p>PS1.A: Structure and Properties of Matter</p>

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Earth and Space Science				
2016 Indiana Academic Standards	Clarifying Statements	Vocabulary	Crosscutting Concepts	Disciplinary Core Idea
<p>5.ESS.1 Analyze the scale of our solar system and its components: our solar system includes the sun, moon, seven other planets and their moons, and many other objects like asteroids and comets.</p>		<p>Planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune asteroids – rocky, airless worlds that orbit our sun, but are too small to be called planets. Tens of thousands of these minor planets are gathered in the main asteroid belt, a vast doughnut-shaped ring between the orbits of Mars and Jupiter. comets – cosmic snowballs of frozen gases, rock, and dust roughly the size of a small town. When a comet’s orbit brings it close to the sun, it heats up and spews dust and gases into a giant glowing head larger than most planets. The dust and gases form a tail that stretches away from the sun for millions of kilometers.</p>	<p>Scale, Proportion, and Quantity</p>	<p>ESS1.B: Earth and the Solar System</p>
<p>5.ESS.2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.</p>	<p>(1) Examples of patterns could include the position and motion of Earth with respect to the sun and select stars that are visible only in particular months.</p>	<p>constellations – a group of stars forming a recognizable pattern that is traditionally named after its apparent form or identified with a mythological figure</p>	<p>Patterns</p>	<p>ESS1.B: Earth and the Solar System</p>

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5.ESS.3 Investigate ways individual communities within the United States protect the Earth's resources and environment.	(1) Think about the work that the Department of Natural Resources and other government entities is doing in your community.		Systems and System Models	ESS3.C: Human Impacts on Earth Systems
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<p>5.ESS.4 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.</p>	<p>(1) Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere.</p>	<p>geosphere – describes all of the rocks, minerals and ground that are found on and in Earth. This includes all of the mountains on the surface, as well as all of the liquid rock in the mantle below us and the minerals and metals of the outer and inner cores. The continents, the ocean floor, all of the rocks on the surface, and all of the sand in the deserts are all considered part of the geosphere.</p> <p>biosphere – composed of all of the living organisms on the planet. This includes all of the plants, animals, bacteria, fungi, and single-celled organisms found on Earth.</p> <p>hydrosphere – made up of all the water on Earth. This includes all of the rivers, lakes, streams, oceans, groundwater, polar ice caps, glaciers and moisture in the air (like rain and snow). The hydrosphere is found on the <i>surface</i> of Earth, but also extends down several miles below, as well as several miles up into the atmosphere.</p> <p>atmosphere – envelope of gases surrounding a planet</p>	<p style="text-align: center;">Systems and System Models</p>	<p style="text-align: center;">ESS2.A: Earth Materials and Systems</p>
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Life Science				
2016 Indiana Academic Standards	Clarifying Statements	Vocabulary	Crosscutting Concepts	Disciplinary Core Ideas
5.LS.1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	<p>(1) Emphasis is on the idea that matter that is not food (air, water, decomposed materials in the soil) is changed by plants into matter that is food.</p> <p>(2) Examples of systems could include organisms, ecosystems, and Earth.</p>	decomposer – an organism, especially a soil bacterium, fungus, or invertebrate, that decomposes organic material	Systems and System Models	<p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</p>
5.LS.2 Observe and classify common Indiana organisms as producers, consumers, decomposers, or predator and prey based on their relationships and interactions with other organisms in their ecosystem.		<p>producer – an organism that is able to produce its own food from inorganic substances</p> <p>consumer – an organism that feeds on plants or other animals</p> <p>decomposer – an organism that breaks down the cells of dead plants and animals into smaller substances</p> <p>predator – any organism that exists by preying upon other organisms</p> <p>prey – an animal hunted or seized for food</p>		<p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</p>

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5.LS.3 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	(1) Emphasis is on systems of information transfer.		Systems and System Models	LS1.D: Information Processing
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Engineering				
2016 Indiana Academic Standards	Clarifying Statements	Vocabulary	Crosscutting Concepts	Disciplinary Core Ideas
3-5.E.1 Identify a simple problem with the design of an object that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost.			Influence of Engineering, Technology, and Science on Society and the Natural World	ETS1.A: Defining and Delimiting Engineering Problems
3-5.E.2 Construct and compare multiple plausible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.			Influence of Engineering, Technology, and Science on Society and the Natural World	ETS1.B: Developing Possible Solutions

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<p>3-5.E.3 Construct and perform fair investigations in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>		<p>prototype – the original or model on which something is based or formed</p>	<p>ETS1.B: Developing Possible Solutions</p> <p>ETS1.C: Optimizing the Design Solution</p>
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