

Instructional and Assessment Guidance
Indiana Academic Standards, including the Content Connectors: 2016-17
ISTAR: Science – Grades 3 and 4

Symbol	Content Priority	Approximate Instructional Time
✓+	Critical	60 - 80%
✓	Important	40 - 60%
□	Additional	5 - 10%

Indiana Academic Standards	Content Connectors	Priority
Grade 3 - Standard 1: Physical Science		
3.1.4: Investigate how light travels through the air and tends to maintain its direction until it interacts with some other object or material.	3.1.4.a.1: Light travels in a straight line (unless it is being reflected, refracted, or diffracted).	✓
Grade 3 – Standard 2: Earth Science		
3.2.5: Describe natural materials and give examples of how they sustain the lives of plants and animals.	3.2.5.a.1: Plants need sun, soil, water. Animals need food, water, and shelter.	✓
3.2.6: Describe how the properties of earth materials make them useful to humans in different ways. Describe ways that humans have altered these resources to meet their needs for survival.	3.2.6.a.1: Earth materials need to be changed to be useful such as trees to lumber and petroleum to gasoline.	✓
Grade 3 – Standard 3: Life Science		
3.3.2: Investigate plant growth over time, take measurements in SI units, record the data and display the data in graphs. Examine factors that might influence plant growth.	3.3.2.a.1: Plant growth can be measured and recorded. Plant growth depends on amount of water and sunlight.	✓
Grade 3 – Standard 4: Science, Engineering and Technology		
3.4.1: Choose and use the appropriate tools to estimate and measure length, mass, and temperature in SI units.	3.4.1.a.1: Rulers are for measuring length. Balances are used for measuring mass. Thermometers are used for measuring temperature.	✓
Grade 4 – Nature of Science		
4.NS.1: Make predictions and formulate testable questions.	4.NS.1.a.1: Predictions are part of scientific investigations.	✓
4.NS.4: Perform investigations using appropriate tools and technologies that will extend the senses.	4.NS.4.a.1: Certain tools are appropriate for certain measurements.	✓
Grade 4 – The Design Process		
4.DP.1: Identify a need or problem to be solved.	4.DP.1.a.1: Problems can be identified.	✓
4.DP.4: Select a solution to the need or problem.	4.DP.4.a.1: Problems can be solved through science and engineering.	✓
4.DP.5: Select the most appropriate materials to develop a solution that will meet the need.	4.DP.5.a.1: Some materials are more appropriate for solving problems than others.	✓

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Indiana Academic Standards	Content Connectors	Priority
Grade 4 – Standard 1: Physical Science		
4.1.3: Construct a complete circuit through which an electrical current can pass as evidenced by the lighting of a bulb or ringing of a bell.	4.1.3.a.1: Devices will only work when a circuit is complete.	✓
Grade 4 – Standard 2: Earth Science		
4.2.2: Describe how wind, water and glacial ice shape and reshape earth's land surface by eroding rock and soil in some areas and depositing them in other areas in a process that occurs over a long period of time.	4.2.2.a.1: Wind and water reshape the earth's surface by erosion and deposition.	✓
4.2.4: Investigate earth materials that serve as natural resources and gather data to determine which ones are limited by supply.	4.2.4.a.1: Earth materials serve as natural resources and are limited.	✓
4.2.5: Describe methods that humans currently use to extend the use of natural resources.	4.2.5.a.1: Methods of extending natural resources include: reduce, reuse, recycle.	✓
Grade 4 – Standard 3: Life Science		
4.3.1: Observe and describe how offspring are very much, but not exactly, like their parents or one another. Describe how these differences in physical characteristics among individuals in a population may be advantageous for survival and reproduction.	4.3.1.a.1: Traits that are passed from parent to offspring may be advantageous for survival.	✓+
4.3.2: Observe, compare and record the physical characteristics of living plants or animals from widely different environments. Describe how each plant or animal is adapted to its environment.	4.3.2.a.1: Plants and animals have different characteristics based on their natural environments.	✓+
Grade 4 – Standard 4: Science, Engineering and Technology		
4.4.1: Investigate transportation systems and devices that operate on or in land, water, air and space and recognize the forces (lift, drag, friction, thrust and gravity) that affect their motion.	4.4.1.a.1: Different forms of transportation are designed for land, water, air, or space.	✓

Instructional and Assessment Guidance
Indiana Academic Standards, including the Content Connectors: 2016-17
ISTAR: Science – Grades 5 and 6

Symbol	Content Priority	Approximate Instructional Time
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Indiana Academic Standards	Content Connectors	Priority
Grade 5 – Standard 1: Physical Science		
5.1.1: Describe and measure the volume and weight of a sample of a given material.	5.1.1.a.1: All material has volume and weight.	✓
5.1.3: Demonstrate that regardless of how parts of an object are assembled the weight of the whole object is identical to the sum of the weight of the parts; however, the volume can differ from the sum of the volumes.	5.1.3.a.1: The weight of an object equals the sum of its parts.	✓
Grade 5 – Standard 2: Earth and Space Science		
5.2.1: Recognize that our earth is part of the solar system in which the sun, an average star, is the central and largest body. Observe that our solar system includes the sun, moon, seven other planets and their moons, and many other smaller objects like asteroids and comets.	5.2.1.a.1: Earth is a planet in the solar system in which the sun is the center of the solar system.	✓+
Grade 5 – Standard 3: Life Science		
5.3.1: Observe and classify common Indiana organisms as producers, consumers, decomposers, predator and prey based on their relationships and interactions with other organisms in their ecosystem.	5.3.1.a.1: Organisms can be classified based on their relationships to and interactions with other organisms in an ecosystem.	✓
Grade 5 – Standard 4: Science, Engineering and Technology		
5.4.1: Investigate technologies that mimic human or animal musculoskeletal systems in order to meet a need.	5.4.1.a.1: Technology is often based on human or animal systems.	✓+
Grade 6 – Nature of Science		
6.NS.1: Make predictions and develop testable questions based on research and prior knowledge.	6.NS.1.a.1: Predictions are part of scientific investigations and are based on prior knowledge.	✓+
6.NS.3: Collect quantitative data with appropriate tools or technologies and use appropriate units to label numerical data.	6.NS.3.a.1: Certain tools and some units are more appropriate for certain measurements.	✓
Grade 6 – The Design Process		
6.DP.1: Identify a need or problem to be solved.	6.DP.1.a.1: Problems can be identified.	✓
6.DP.4: Select a solution to the need or problem.	6.DP.4.a.1: Problems can be solved through science and engineering.	✓
6.DP.5: Select the most appropriate materials to develop a solution that will meet the need.	6.DP.5.a.1: Some materials are more appropriate for solving problems than others.	✓

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Indiana Academic Standards	Content Connectors	Priority
Grade 6 – Standard 1: Physical Science		
6.1.2: Explain the properties of solids, liquids, and gases using drawings and models that represent matter as particles in motion whose state can be represented by the relative positions and movement of the particles.	6.1.2.a.1: All matter is organized by similar properties.	✓
6.1.4: Recognize that objects in motion have kinetic energy and objects at rest have potential energy.	6.1.4.a.1: Energy can be classified as kinetic or potential.	✓
6.1.7: Explain that energy may be manifested as heat, light, electricity, mechanical motion, and sound and is often associated with chemical reactions.	6.1.7.a.1: Energy is associated with heat, light, electricity, motion and sound.	✓
Grade 6 – Standard 2: Earth and Space Science		
6.2.4: With regard to their size, composition, distance from sun, surface features and ability to support life, compare and contrast the planets of the solar system with one another and with asteroids and comets.	6.2.4.a.1: Planets are different from one another.	✓
6.2.5: Demonstrate that the seasons in both hemispheres are the result of the inclination of the earth on its axis, which causes changes in sunlight intensity and length of day.	6.2.5.a.1: Environmental conditions on earth are affected by seasonal patterns and weather changes.	✓
Grade 6 – Standard 3: Life Science		
6.3.1: Describe specific relationships (i.e., predator and prey, consumer and producer, and parasite and host) between organisms and determine whether these relationships are competitive or mutually beneficial.	6.3.1.a.1: Relationships between organisms can be harmful or beneficial.	✓
6.3.6: Recognize that food provides the energy for the work that cells do and is a source of the molecular building blocks that can be incorporated into a cell's structure or stored for later use.	6.3.6.a.1: Food converts to energy.	✓
Grade 6 – Standard 4: Science, Engineering and Technology		
6.4.3: Describe the transfer of energy amongst energy interactions.	6.4.3.a.1: Describe the transfer of energy amongst energy interactions.	✓

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ISTAR: Science – High School

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Indiana Academic Standards	Content Connectors	Priority
Nature of Science		
10.NS.1: Develop explanations based on reproducible data and observations gathered during laboratory investigations.	10.NS.1.a.1: Science involves observation, experimentation, validation, and changing understandings.	✓+
10.NS.2: Recognize that their explanations must be based both on their data and other known information from investigations of others.	10.NS.2.a.1: Use multiple sources of information to develop an answer.	✓+
10.NS.5: Apply standard techniques in laboratory investigations to measure physical quantities in appropriate units and convert quantities to other units as necessary.	10.NS.5.a.1: Use appropriate tools to measure during investigations.	✓+
Standard 1: Cellular Chemistry		
B.1.1: Describe the structure of the major categories of organic compounds that make up living organisms in terms of their building blocks and the small number of chemical elements (i.e., carbon, hydrogen, nitrogen, oxygen, phosphorous and sulfur) from which they are composed.	B.1.1.a.1: All living organisms are made up of chemical elements.	✓
Standard 2: Cellular Structure		
B.2.1: Describe features common to all cells that are essential for growth and survival. Explain their functions.	B.2.1.a.1: All living things are made of cells.	✓
Standard 3: Matter Cycles and Energy Transfer		
B.3.1: Describe how some organisms capture the sun's energy through the process of photosynthesis by converting carbon dioxide and water into high-energy compounds and releasing oxygen.	B.3.1.a.1: Living things must take in substances in order to make energy.	✓
B.3.4: Describe how matter cycles through an ecosystem by way of food chains and food webs and how organisms convert that matter into a variety of organic molecules to be used in part in their own cellular structures.	B.3.4.a.1: Energy changes form as it flows through living things.	✓
Standard 4: Interdependence		
B.4.1: Explain that the amount of life environments can support is limited by the available energy, water, oxygen and minerals and by the ability of ecosystems to recycle the remains of dead organisms.	B.4.1: Life is limited by the amount of available resources.	✓

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B.4.2: Describe how human activities and natural phenomena can change the flow and of matter and energy in an ecosystem and how those changes impact other species.	B.4.2.a.1: Natural changes and human behavior impact the entire ecosystem.	✓
Standard 5: Molecular Basis of Heredity		
B.5.2: Describe how hereditary information passed from parents to offspring is encoded in the regions of DNA molecules called	B.5.2.a.1: Genes make living things unique.	✓
Standard 6: Cellular Reproduction		
B.6.1: Describe the process of mitosis and explain that this process ordinarily results in daughter cells with a genetic make-up identical to the parent cells.	B.6.1.a.1: Organisms grow by cell division.	✓
Standard 7: Genetics		
B.7.3: Determine the likelihood of the appearance of a specific trait in an offspring given the genetic make-up of the parents.	B.7.3.a.1: Living creatures have physical differences and similarities.	✓
Standard 8: Evolution		
B.8.5: Describe how organisms with beneficial traits are more likely to survive, reproduce, and pass on their genetic information due to genetic variations, environmental forces and reproductive pressures.	B.8.5.a.1: Living things are adapted to survive in a particular environment and pass these adaptations to their offspring.	✓