

**Big Idea: Habitats/Adaptations Plant/Animals (Structures and Functions of Living Things) Quarter 2**

**Inquiry Questions**

Science:

- How do organisms meet some of their needs from their environment?
  - How might plants or animals adapt to changes in their environment?
  - How do plant structures help them survive and reproduce? (Les. 1 pages 94-107)
  - How do animal structures help them survive? (Les. 2 pages 108-121)
  - How do animals sense and respond to information? (Les. 3 pages 122-137)
  - How do animals see? (Les. 4)
  - How are physical characteristics of plants and animals advantageous of their environment?

Technology & Engineering:

- How does technology impact nature negatively and positively?
- How do different systems interact to sustain life?
- How might human made environments impact or effect humans, plants and animals?
- What environmental factors impact planning guidelines for modern communities?
- What may happen when a part of a system is removed?

Mathematics:

- Where might you find examples of symmetry in nature and in the environment?
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Social Studies:

- How did early Indiana civilizations adapt to their environments?
- How might resources differ in various regions around Indiana and the world?
- How might the availability of natural resources impact various regions in Indiana?

**Content Area Grade Level Standards**

**Science**

4.LS.1 Observe, analyze, and interpret 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. **(traits, inherited, population)**

4.LS.2 Use evidence to support the explanation that a change in the environment may result if a plant or animal will survive and reproduce, move to a new location, or die. **(adaptation, photosynthesis, stomata, transpiration, respiration, cone, stimulus, response, tropism) Les. 1 (structural adaptation, internal structure, respiratory system, external structure) Les. 2**

4.LS.3 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction in a different ecosystems. **(Les. 2 vocabulary)**

**Note: Words in parenthesis are module and academic standard vocabulary**

**Note: 4.LS.1 will need supplemented as they are NOT covered in the book!!!!!!!!!!!!!! See vocabulary above!**

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**Technology & Engineering**

- STL 1.C Things that are found in nature differ from things that are human-made in how they are produced and used.
- STL 2. F A subsystem is a system that operates as a part of another system.
- STL 2.G When parts of a system are missing, it may not work as planned.
- STL 3. C Various relationships exist between technology and other fields of study.
- STL 4. C The use of technology can have unintended consequences.
- STL 5. C The use of technology affects the environment in good and bad way
- STL 13.C Compare, contrast, and classify collected information in order to identify patterns.
- STL 13. D Investigate and assess the influence of a specific technology on the individual, family, community, and environment.
- STL 15. C Artificial ecosystems are human-made environments that are designed to function as a unit and are comprised of humans, plants, and animals
- STL 15. E Many processes used in agriculture require different procedures, products, or systems.
- STL 20. C Modern communities are usually planned according to guidelines

**Mathematics**

- 4.OA.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- 4.NBT.2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- 4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- 4.NF.1. Explain why a fraction  $\frac{a}{b}$  is equivalent to a fraction  $\frac{(n \times a)}{(n \times b)}$  by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

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4.NF.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as  $\frac{1}{2}$ . Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions, e.g., by using a visual fraction model.  
 Connection: 4.RI.5; ET04-S1C4-01

4.G.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

**Social Studies**

4.1.1 Identify and compare the major early cultures that existed in the region that became Indiana prior to contact with Europeans (individuals, society and culture)

4.1.2 Identify and describe historic Native American Indian Groups that lived in Indiana at the time of Early European Exploration including ways these groups adapted to and interacted with the physical environment (individuals, society and culture)

4.3.4 Map and describe the physical regions of Indiana and identify the major natural resources and crop regions.

4.1.12 Describe the transformation of Indiana through immigration and through developments in agriculture, industry and transportation. (Individuals, society and culture)

4.3.2 Estimate distances between two places on a map using scale of miles and use cardinal and intermediate directions when referring to relative location.

4.3.7 Explain the effect of the Earth/Sun relationship on the climate of Indiana.

4.3.8 Identify the challenges in the physical landscape of Indiana to early settlers and modern day economic development.

4.3.12 Read and interpret thematic maps-such as transportation, population, and products to acquire information about Indiana in the present and past.

**ELA**

**Reading: Informational Text**

CCSS.ELA-Literacy.RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-Literacy.RI.4.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.

CCSS.ELA-Literacy.RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

CCSS.ELA-Literacy.RI.4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

CCSS.ELA-Literacy.RI.4.5 Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

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CCSS.ELA-Literacy.RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

CCSS.ELA-Literacy.RI.4.8 Explain how an author uses reasons and evidence to support particular points in a text.

CCSS.ELA-Literacy.RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-Literacy.RI.4.10 By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

CCSS RF 4.3 Know and apply grade level phonics and word analysis skills in decoding words.

**WRITING**

CCSS.ELA-Literacy.W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- W.4.2a Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
- W.4.2b Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
- W.4.2c Link ideas within categories of information using words and phrases (e.g., *another, for example, also, because*).
- W.4.2d Use precise language and domain-specific vocabulary to inform about or explain the topic.
- W.4.2e Provide a concluding statement or section related to the information or explanation presented.
- W.4.4 Produce clear and coherent writing in which the development and organization are appropriate to the task, purpose and audience.

CCSS.ELA-Literacy.W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.

CCSS.ELA-Literacy.W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

CCSS.ELA-Literacy.W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-Literacy.W.4.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences

**SPEAKING AND LISTENING**

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SLA 4.1 Engage effectively in a range of collaborative discussions. With diverse partners on grade 4 topics and texts, building on others ideas and expressing their own clearly.

SLA 4.2 Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

SLA 4.4 Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or things; speak clearly at an understandable pace.

SLA 4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or things.

SLA 4.3 Use knowledge of language and its conventions when writing , speaking, reading, or listening.

SLA 4.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being and that are basic to a particular topic.

## Science Process Standards

## Standards for Mathematical Practice

## Science Process Standards

***Nature of Science***

- Make predictions and formulate testable questions
- Design a fair test.
- Plan and carry out investigations—often over a period of several lessons—as a class, in small groups or independently.
- Perform investigations using appropriate tools and technologies that will extend the senses.
- Use measurement skills and apply appropriate units when collecting data.
- Test predictions with multiple trials.
- Keep accurate records in a notebook during investigations and communicate findings to others using graphs, charts, maps and models through oral and written reports.
- Identify simple patterns in data and propose explanations to account for the patterns.
- Compare the results of an investigation with the prediction.

***Design Process***

- Identify a need or problem to be solved.
- Brainstorm potential solutions.
- Document the design throughout the entire design process.
- Select a solution to the need or problem.
- Select the most appropriate materials to develop a solution that will meet the need.
- Create the solution through a prototype.
- Test and evaluate how well the solution meets the goal.
- Evaluate and test the design using measurement.
- Present evidence by using mathematical representations (e.g. graphs, data tables)
- Communicate the solution (including evidence using mathematical representations (graphs, data tables), drawings or prototypes.
- Communicate how to improve the solution.

## Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7. Look for and make use of structure.
- MP.8. Look for and express regularity in repeated reasoning.

## Vocabulary

Habitat, adaptation, environment, genetic, offspring, reproduction, stimuli, survival, latitude, longitude, cardinal directions, intermediate directions, agriculture, physical characteristics, lithosphere, hydrosphere, climate, population, civilization, biome

## Resources

- <http://www.need.org/needpdf/Energy%20Math%20Challenge.pdf>
- <http://www.partselect.com/JustForFun/Electric-Math-Numbers-Behind-Appliances.aspx>
- <http://www.eia.gov/kids/energy.cfm?page=6>

**Guiding Questions – Plan of Work**

**Common Misconceptions**

What misconceptions might students have with these ideas?

- Structures don't have a function or a purpose.
- Plants don't reproduce as well as animals.
- Humans are animals.
- Animals in Indiana live everywhere and other animals from around the world live here as well.
- Research biomes from around the world

**Profiles of Practice**

- Growing hydroponic plants
- Growing seeds using different stimuli and variables.
- Studying various habitats and biomes
- Observing the physical structures various living organisms
- Build an ecosystem in a bottle
- Research family tree and genetics, family characteristics. How offspring are very much like their parents
- Create a new organisms and/or plant
- Picture match baby animals with parents

**Assessment**

Type of Assessment	Example
<input type="checkbox"/> Observation	Record observations in notebooks, journal. Observe animal structures
<input type="checkbox"/> Oral Questioning	Ask comprehension questions frequently over the unit
<input type="checkbox"/> Exit Slip	
<input type="checkbox"/> Journal	Science notebooks, keep accurate notes and diagrams
<input type="checkbox"/> Graphic Organizers	
<input type="checkbox"/> Self-Assessment	
<input type="checkbox"/> Writing Prompt	List 6 animals and 6 possible adaptations; students match them up and write how they use them.
<input type="checkbox"/> Presentation	Create biome posters and present to class/school display

**Guiding Questions – Plan of Work**

<b><u>Guiding Questions – Plan of Work</u></b>	
<input type="checkbox"/> Electronic media	
<input type="checkbox"/> Think Pair Share	
<input type="checkbox"/> Whiteboards	
<input type="checkbox"/> Experiment/projects	
<input type="checkbox"/> Quiz	Paper pencil test
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	