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**Food Chains and Food Webs**

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| **Estimated Time:** 1-2 class sessions | |
| **GSE Standard(s) and Element(s):**  **S4L1. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem.**   1. Develop a model to describe the roles of producers, consumers and decomposers in a community (Clarification statement: Students are not expected to identify the different types of consumers- herbivores, carnivores, omnivores, and scavengers.) 2. Develop simple models to illustrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers and decomposers.   **Supporting Standards**  **ELAGSE4RL1**: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.  **ELAGSE4RI1:** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.  **ELAGSE4RI3:** 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.  **ELAGSE4RI4:** Determine the meaning of general academic language and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.  **ELAGSE4RI7:** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.  **ELAGSE4RI9:** Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.  **ELAGSE4W4:** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.  **ELAGSE4W7:** Conduct short research projects that build knowledge through investigation of different aspects of a topic.  **ELAGSE4SL1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others’ ideas and expressing their own clearly.  **ELAGSE4SL4:** 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 themes; speak clearly at an understandable pace.  **ELAGSE4L1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.  **ELAGSE4L2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.  **ELAGSE4L6:** Acquire and use accurately grade-appropriate general academic and domain-specific vocabulary, including words and phrases that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and words and phrases basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation). | |
| **Science and Engineering Practices:**  **Developing and Using Models:**  Develop and/or use models to describe and/or predict phenomena. | **Disciplinary Core Ideas:**  **PS3.D: Energy in Chemical Processes and Everyday Life**  The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water).  **LS1.C: Organization for Matter and Energy Flow in Organisms**  Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. |
| **Crosscutting Concepts:**   * Energy and Matter * Systems and System Models * Patterns * Cause and Effect |
| **Authentic Scenario (Phenomena):**  Show the students a picture of a Beta fish/Peace lily Ecosystem: <https://www.pinterest.com/pin/225391156330148012/> | **Vocabulary:**   * organisms * energy * ecosystem * producers * consumers * decomposers * food web * food chain * flow * scarce * extinct * over-abundant |
| **Guiding Questions:**  What are the roles of the producers, consumers, and decomposers in an ecosystem?  How does the flow of energy go through a food chain?  Where does energy come from?  What makes an animal a consumer?  What makes a plant a producer?  What do decomposers feed on?  Why do all food chains and food webs start with the sun? |
| **Materials Needed:**   * Beta fish/Peace lily Ecosystem Picture * Tangled Web Student Recording Sheet | **Safety Considerations:**   * N/A |
| **Technology Integration:**   * Device with Internet access |

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| **5E Stage** | **Student Activities**  How will students engage actively in the three dimensions throughout the lesson?  **Teacher Activities**  How will the teacher facilitate and monitor student learning? |
| **Engage** | Show the students a picture of a Beta fish/Peace lily Ecosystem: <https://www.pinterest.com/pin/225391156330148012/>  Ask, ‘What do you notice? What do you wonder?”  Explain that these systems were very popular several years ago and that they were supposed to be very self-sufficient. The idea was that the fish ate the plant and the plant fed off of the fish waste. Ask students if they have seen or owned one. Many of the students will be familiar with the system.  Explain to the students that ecosystems are all of the living things (plants, animals, and organisms) in a given area, interacting with each other, and also with their non-living environments (weather, earth, sun, soil, climate, atmosphere). In an ecosystem, each organism has its special role to play. |
| **Explore** | Watch the video Fabulous Food Chains: Crash Course Kids #7.1: <https://youtu.be/MuKs9o1s8h8>  Then, use [Oh! What a Tangled Web](Oh!%20What%20a%20Tangled%20Web.docx) for guided reading. *Students will create simple food chain and food web models.* |
| **Explain** | Revisit the idea of the Beta fish/Peace lily “ecosystem”. Ask the students to identify the roles of the Peace lily and the Beta fish (producer and consumer). Was this a complete ecosystem? If not, what was missing?  (Decomposer was missing, which usually meant that the food web was incomplete. Also, the plant did not provide enough food for the beta fish, so fish food had to be introduced or the fish would starve.)  **Differentiation:**  Allow students with writing disabilities to videotape or share aloud their story from the Elaborate portion of the lesson.  Group students with similar learning styles.  If students struggle with individual or small group research the class could research together with the teacher’s guidance.  Students can work in pairs to discuss the food web and food chain models that they create. |
| **Elaborate** | Use the link [Wonderopolis: Who's at the top of the food chain?](https://wonderopolis.org/wonder/whos-at-the-top-of-the-food-chain) to further investigate food chains and food webs. Students could also complete the Did You Get It online quiz for a formative assessment. |
| **Evaluate** | What foods do you commonly eat? Where do they come from? Make a top ten list of the things you eat most often. Then, do some research or ask a friend, classmate, or family member to help you find out where your food comes from. Is it from a farm down the road or across the world? How do you get energy from the food you eat? Create your own food chain from your food list. Use this writing connection to evaluate students’ understanding of how energy flows through an ecosystem. |