

What's for Lunch?

Grade Level: 4-8

Students will learn about food chains and create their own. Students will also use research materials to learn about an insect of their choice.

Student Objectives

1. Design a simple food chain.
2. Describe why organisms fall where they do in a food chain.
3. Explain any survival features an insect in the food chain might have.

Materials

- ✓ Insect Investigation Worksheet
- ✓ Food Chain Worksheet
- ✓ Internet access (optional)
- ✓ Reference materials

Vocabulary

- **abdomen** – the rear part of an insect's body.
- **adaptation** – a change in a plant or animal that makes it better able to live in a particular place or situation.
- **antenna** - a thin sensitive organ on the head of an insect, that is used mainly to feel and touch things.
- **arthropods** – animals that have a hard outer shell called an exoskeleton that supports and protects the animal's soft body.
- **camouflage** - something (such as color or shape) that protects an animal from attack by making the animal difficult to see in the area around it.
- **carnivore** – an animal that eats meat.
- **consumer** – an organism requiring.
- **decomposer** – organisms such as bacteria and fungi that decompose dead plants and animals.
- **ecosystem** – a functional unit consisting of all the living organisms (plants, animals and microbes) in a given area, and all the nonliving physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size – a log, pond, field, forest or the Earth's biosphere – but it always functions as a whole unit.

- **energy** – the capacity for vigorous activity; available power; the capacity to do work.
- **entomologist** – scientist that deals with the study of insects.
- **environment** – the surrounding in which an organism lives, including air, water, land, natural resources, flora, fauna, humans and their interrelationships.
- **exoskeleton** - hard outer covering of insects or crustaceans.
- **food chain** – a sequence of organisms, each of which uses the next, lower member of the sequence as a food source.
- **food web** – a complex network of many interconnected food chains and feeding interactions.
- **habitat** – the place or type of place where a plant or animal naturally or normally lives or grows.
- **head** – the first part of an insect's body containing the brain, antennae and mouth parts.
- **herbivore** – an organism that eats plants.
- **insects** – a small animal that has six legs and a body formed of three parts and that may have wings.
- **larva** – a very young form of an insect.
- **metamorphosis** – a major change in the form or structure of some insects that happens as the insect becomes an adult.
- **mimic/mimicry** – to imitate or closely resemble another living thing/practice of mimicking.
- **nocturnal** – active mainly during the night.
- **omnivore** – an animal that eats both plants and meat.
- **predator** – animal that feeds on other animals.
- **prey** – animal that is food for another animal.
- **producer** – any organism that is capable of producing its own food, usually through photosynthesis.
- **thorax** – the middle section of an insect's body where legs and wings attach.

Background Information

Beginning with the sun, every part of a food chain is integral. If one part of a food chain disappears, it can affect all species before and after it by potentially having an overabundance of whatever would have been consumed, and a lack of food sources for those that would have fed on it.

Food webs, multiple interconnected food chains, have a variety of plants, primary, secondary, and tertiary consumers, as well as decomposers that if one food source is unavailable, another most likely is.

Procedure

1. Start the activity using Sip, Slurp, Suck and Chew
 - a. Assemble the following items:
 - pictures of a housefly, grasshopper, female mosquito and a butterfly or moth
 - spring clothespin
 - sponge
 - syringe/pipette
 - straw
 - glass filled with colored water
 - b. Hold up pictures of the insects. Ask the students to identify each of the insects and to name a food that each insect eats. Responses could include blood, leaves, nectar, dead animals, manure, fungi and wood, etc. Explain that each of these insects has a different type of mouthpart. Insects have different mouths as they all eat different types of foods. Compare the insect mouths with the following tools to demonstrate how each mouthpart works.
 - c. A grasshopper's mouthparts work like a spring clothespin to tear and chew plants. Their jaws move sideways, not up and down as people's do. To demonstrate, hold the clothespin and manipulate it back and forth.
 - d. Female mosquitoes use their needle-like mouthparts to draw up blood in much the same way as a doctor uses a needle and syringe/pipette. To demonstrate, put a syringe/pipette into a glass of colored water and draw some of it up.

- e. A housefly's mouthparts work like a sponge to soak up liquids. To demonstrate, pour out a little water and soak it up with a sponge.
 - f. Butterflies and moths feed on the nectar from flowers. They have long, tongue-like mouthparts that are used like a straw to sip up the nectar.
 - g. At the end of the demonstration, again ask your students to identify the insects and to name a food that they would eat now that they know which type of mouthpart each insect has.
2. Discuss with students that all food chains begin with the sun so that plants can make food for animals and insects to eat. After an herbivore has eaten a plant the herbivore will become prey for an animal or insect that will then become food for another animal in the chain. If any part of this chain is disturbed, it can affect the balance at both ends of the chain by an overabundance of food on one end, or a lack of food on the other end.
 3. Ask the students the following questions and, as a class, have them brainstorm some potential answers:
 - Have the students brainstorm ways that animals and insects can attempt to not become the meal for a predator. (Some possible answers may be camouflage, defensive structures, mimicking the look of a foul-tasting animal, good hearing or vision, high reproduction rates, etc.).
 - What needs to happen for a predator to be considered successful? (Surviving long enough to reproduce.)
 - What are some attributes that would help predators be more successful? (Type of mouth [piercing, sucking, chewing], claws, legs, venom, etc.).
 4. After the discussion and brainstorming session, instruct the students to choose an insect to research using any available resources and record the information on the Insect Investigation worksheet. Students should share a printed or drawn picture as well as the sources of their information.
 5. After students have completed the worksheet, have them design at least a five-step food chain using the insect they researched. This food chain may be documented on the Food Chain worksheet provided.

Extension Activities

1. Challenge students to construct their improved insect out of classroom or household items.
2. Have student make a diorama of their insect in its habitat.

Additional Resources

- [Peterson First Guide to Insects](#) by Christopher Leahy
- <https://forces.si.edu/main/pdf/2-5-WeavingTheWeb.pdf>
- <https://extensionentomology.tamu.edu/resources/insects/all-insects/> Texas A&M Extension Entomology insect factsheets
- <http://www.uky.edu/Ag/CritterFiles/casefile/casefile.htm> University of Kentucky Entomology Critter Files
- <https://learn.genetics.utah.edu/content/herbivores/whytheymatter> Insect Herbivores & Why They Matter video
- <https://www.calacademy.org/educators/lesson-plans/invent-an-insect>

Standards

Illinois Science Standard

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

Illinois English Language Arts Standard

RST 1: Cite specific textual evidence to support analysis of science and technical texts.

The **M**ultidisciplinary **A**gricultural **I**ntegrated **C**urriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in April 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

Insect mAGic project update writers/reviewers: Rhodora Collins – Dekalb County; Suzi Myers – Kane County; Connie Niemann – Montgomery County; Debbie Ruff – Livingston County; Jennifer Waters – Sangamon County; and Dawn Weinberg – Hancock County.

Name _____

Insect Investigation

Name of Insect:

Habitat:

Predators:

Prey/Food:

Special Features:

Interesting Fact(s):

Is this a beneficial or detrimental insect to other plants or animals? Why?

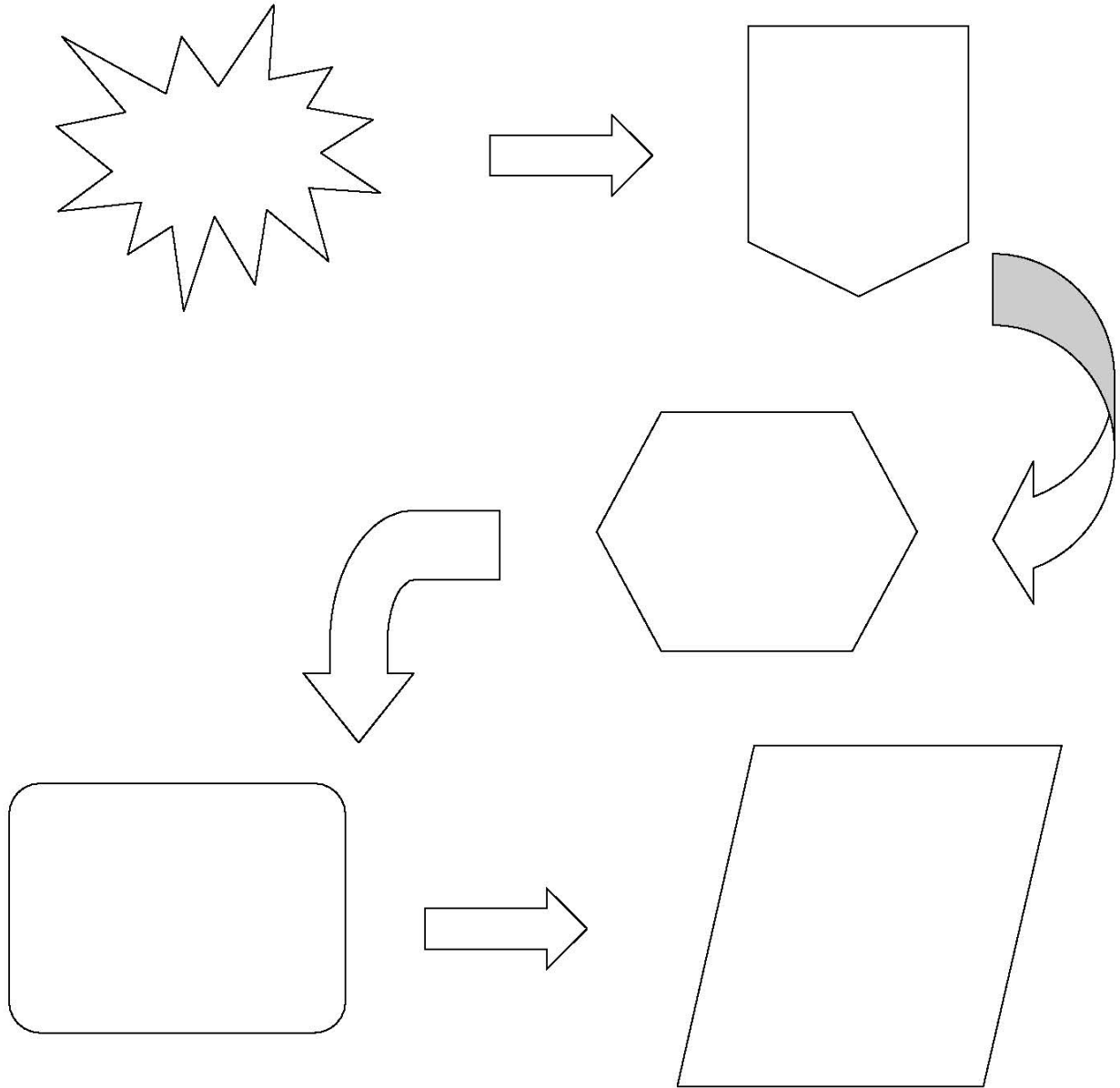
What features would you change to improve this insect? Why?

Source(s) of information:

Provide a picture (printed or drawn) of this insect (use the back of the page, if needed):

Name _____

Food Chain



Food Chain Answer Key

Answers will vary with each student. Please accept all reasonable answers.

