

Arthropod Lesson Plan – Elementary

Recommended Grade Level: 3rd-5th grades

Duration: 3-4 class periods (2-3 class periods if a portion of the plan is independent or accomplished at home).

Scientific Background

In the age of technology, Nature Deficit Disorder is a real and chronic problem with today's youth. This lesson plan aims to increase the student's time in nature through both hands-on living wild experiences and scientific classroom research.

Objectives

- Students in Missouri schools will acquire the knowledge and skills to gather, analyze, observe, record, and apply research information and ideas.
- Students will use tools of observation and science inquiry to identify common arthropods and their group classification.
- Students will investigate a specific arthropod and its habitat.
- Students will be able to determine whether an arthropod is considered beneficial or pest ("friend or foe").
- Students will have knowledge of why certain arthropods live in specific areas.
- Students will apply their knowledge in designing, constructing, and factual interpretation for their assigned arthropod by way of a diorama and oral presentation.
- Students will be able to spell and define vocabulary words

Learning Standards

This lesson meets the criteria for more than ten Grade-and Course-Level Expectations for Science Education for grades 3-5.

Materials

- Research materials about arthropods (trunk content)
- Identification Guides (trunk content)
- Bug Viewers (trunk content)
- Paper and pencil
- Sticky Traps
- Shoebox or other container
- Modeling clay
- Glue
- Plastic, rubber, or craft made insects.
- Craft supplies (paint, markers, crayons, cardboard, felt, foam board, pipe cleaners, etc.)

Lesson Preparation

- Organize students into groups or instruct students to work on an individual basis.
- Make copies of the activity and identification guides as needed.

- Make arrangements for students to participate in a “nature walk” either during class time or at home. This walk can be conducted in the school yard, park, or the student’s yard at home.
- Give students time to familiarize themselves with trunk content of instructors choosing.
- Present students with the lesson vocabulary words and definitions listed at the end of the plan.
- Utilizing trunk contents such as acrylic blocks and laminated cards, share examples of beneficial and pest arthropods.

Challenge One:

- a. Arrange for students to venture to one or more natural areas. If working in classroom groups, this could be the school yard or park. If working independently, students can utilize an outdoor space at home. Students will need a notepad and pencil. Observe flying arthropods and collect flightless arthropods for temporary observation through bug viewers. This will include turning over rocks, logs, and debris.
- b. Students will then answer the following questions:
 - What flying insects do you see?
 - Do you hear any insect communication? If so, is it through wing beats or leg rubs?
 - Are the arthropods you have collected insect, arachnid, or myriapod?
 - How do the three groups differ? How are they similar?

Analysis:

- Back in the classroom, students will compile their observation data.
- If more than one natural area was used, or students completed the challenge independently, compare the different types of environments where the arthropods were observed.
 - Forest?
 - Grassland?
 - Wetland?
 - Yard?
 - Urban garden?
- Do the students think the arthropods observed would be considered friend or foe? Ask them to explain their answer.

Challenge Two:

- a. The instructor should explain the purpose and function of sticky traps to the class. Have students help choose areas in their classroom and school for the instructor to place traps. They need to look for secluded locations, such as near trash cans, dark corners, or moist environments. It’s best to place traps on Friday and leave in place for the weekend or an extended holiday.
- b. Upon returning, the instructor is to gather the traps (instructor may want to place a sheet of cellophane over the top of the sticky trap in order to keep students from coming in contact with the adhesive). Divide the students into groups (group size depends on number of students and amount of sticky traps used) at which time students will analyze the traps and answer the following questions:

- What types of arthropods were captured? (Insect, arachnid, or myriapod)
- How many of each group type were present?
- Did sticky traps in certain areas yield more or less specimens than other areas?

Analysis:

- The students will compile their sticky trap observation data.
- Do the students think that there are reasons why certain sticky traps attracted more specimens? Why?
- Do the students think the arthropods they captured would be considered friend or foe? Ask them to explain their answer.

Challenge Three:

- a. Each student chooses a Missouri arthropod for a case study (alternatively, the instructor may assign each student an arthropod).
- b. Utilizing the information learned in challenges one and two, students will create a diorama depicting the arthropod, its typical habitat, and food sources from materials listed above. Examples for building a diorama can be found at www.wikihow.com/Make-a-Diorama. The diorama should be labeled with the name of the featured arthropod and the student's name.
- c. Student presents their diorama to the class. They explain facts they have learned about that particular arthropod; its habitat, behavior, shelter, what it eats, and whether it is "friend or foe."

Analysis:

- Do students think there are way we can encourage "friend" arthropods to live in our outdoor areas? (Growing native plants, refraining from pesticide use, offering arthropod specific shelter.)
- Are there ways we can discourage "foes"? (Removing all food and water, keep hiding places to a minimum, control moisture.)

Lesson Plan Assessment:

- Do the students feel comfortable working in nature?
- Did the students enjoy studying these animals?
- Are students able to identify the 3 identification groups discussed in this lesson?
- Were the students engaged during the 3 challenges?
- Can students utilize the vocabulary?

VOCABULARY:

Arthropod – An invertebrate animal with an exoskeleton, a segmented body, and paired jointed appendages.

Arachnid – A class of arthropod animals with eight legs and no antennae.

Habitat – The natural home or environment of an animal, plant, or other organism.

Insect – A class of arthropod animals with six legs and antennae.

Invertebrate – Animal without a backbone, such as snails, earthworms, and arthropods.

Myriapod – A subphylum of arthropod animals that have long bodies, many legs, and antennae.

Specimen – an individual animal, plant, piece of a mineral, etc., used as an example of its species or type for scientific study or display.