

NAME: NURTURES Team

LEARNING PLAN: Life Science – NURTURES Institute – Inquiry Lesson

GRADE: 1

LESSON NAME: Bug Life

DOMAIN: Life Science (LS)

DURATION: 5 Day (35 min / 15 min (3) / 40 min)

**NOTES:** In this lesson students plan and carry out investigations using insects in model habitats to examine animal eating habits. Next lesson the students will learn about birds and their adaptations to learn how the structure of an organisms body is related to the functions an organism must perform to survive.

## STANDARDS

*Performance Expectation (targeted by the end of the unit):*

1-LS1-1 – Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

1-LS1-2 – Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

- DCI targeted for this lesson:
  - **LS1.A: Structure and Function – Different animals use their body parts to take in food. (1-LS1-2)**
- SEPs for this lesson:
  - **Planning and carrying out investigations**
  - **Engaging in an argument stemming from evidence**
- CCs targeted for this lesson:
  - **Energy and Matter**

## LEARNING PERFORMANCE(S)

- Students **investigate** the **eating habits of insects** to understand how they **use their body parts** to **get energy**.

## INSTRUCTIONAL SEQUENCE

### **Materials needed:**

- White Board/Chart Paper
- Pencils
- Slugs
- Snails
- Ants
- Beetles
- Soil
- Small spray bottle with water

- Respective habitats for each type of insects
- Tablets/Laptops
- Cucumber
- Tomato
- Leaves
- Honey or Syrup

**Time required:** 35 min / 15 min (3) / 40 min

**Cautions:** Insects may trigger fear responses in some students. Take care to introduce students to insects carefully, and with consideration for introducing them to idea that these insects will not cause them harm, and they will have the opportunity to wash their hands should they touch any insects. Insects should remain in habitats, but students may touch them as they examine elements of the habitat.

### **Introducing the Lesson:**

- **Pre-Lesson**  
Prepare board space to highlight student ideas.
- Students should begin day one of the lesson in small group activity seating, to facilitate discussion of habitat examination.
- Each day groups should have data recording sheet and writing utensils.
- Prepare miniature habitats following guideline in the habitat document for each insect in the “materials needed” section. Insects can be found either in your local habitat or pet stores. Each group receives one insect in a

habitat, and animal food sources (also outlined in habitat document).

### **Instructional Tactics:**

- **DAY 1**
- (5 min) **Open lesson by discussing with students** what kinds of habitats animals might live in, and what makes one habitat different from another. As they come up with ways habitats are different, point out how different animal characteristics might make sense in different habitats (mouth type, fur thickness, wet v dry skin, legs or fins, etc.) As they run out of thoughts, ask them how they think they might find out what much smaller animals' diets are like? Guide the conversation to the topic of insects, finishing by asking them what they thought different types of insects might eat (e.g., ladybug, spider, moth, butterfly, etc.). **(Energy and Matter)**
- (5 min) **After the opening conversation** inform students that they will be provided with the opportunity to learn by observation with these animals, and introducing them to the insects that they will have the opportunity to observe. Make sure that students are aware that the insects are living creatures, and as such their experiences are important while they are kept by the class. They are not to try to touch the insects, although their hands may brush the insects when examining things in the habitat. Take care to assure any students nervous about touching bugs that this will be a safe and clean environment. Following this discussion, distribute the insects within habitats and food sources to groups, instructing them to keep the habitat closed unless instructed to open them.
- (5 min) **As the groups look at the enclosures**, engage students by asking them what they observe about the habitats. What are contained in the habitats, and why do they think those things are in the habitats. Make sure to ask them to elaborate on why they thought what they did. Once students have provided their answers, highlight parts of the habitat (insects, soil, food materials, water, etc.), and ask the students if these things are exactly like what the insects would encounter in their normal environment. Use this conversation to guide them to the realization that though the animals are real, the enclosures they are in are “models” representing the real environment.
- (10 min) **Ask students what they think they could learn from this “model” habitat.** Guide them toward the question for investigation: What does [insect type] eat? Over the course of days 2-5 they will take observations of the foods that the insects eat, and then at the end of the week report back to the class on their findings. To do this, they will need to agree on how they will perform their observations. Guide them to the question of – how do you find out how much food something has eaten? **(LS1.A) (Planning and carrying out investigations) (Energy and Matter)**
  - **Tips for facilitating the discussion:**
    - Students are most likely to arrive at ideas regarding visual observation and/or weighing the food. Whatever methods the students choose, assess your classroom and support them in a procedure they can handle (e.g., if they may lose the animals, let them focus on visual observation).
    - The procedure does not need to be long, just a uniform set of steps that every group will use.
    - Focus on the how, when/how often.
    - Students may also be informed of/given responsible for maintaining moist soil as an additional optional responsibility – per habitat guidelines.
- (10 min) **Ask students to label the container with their group member names** and then begin any procedures associated with the first steps in their decided upon process – such as weighing the food or recording visual appearance of food – for first observations. Containers may then be opened, and food inserted carefully, avoiding releasing or bothering the insects. Students will then seal the container, and then one student will be assigned to put it up to a predetermined storage location where it will remain when not under observation throughout the week. **(Planning and carrying out investigations)**
  - **Potential lesson extension:**
    - Students could decide on food sources to attempt, and they could be brought in and the investigation procedures begin the following day.
- **DAY 2-4**

- (15 min) **Transition students to their small group seats.** Once students are in their group seating arrangement, assign one group member to collect any materials students determined they would need in preparing their investigation procedures. Assign another group member to carefully collect the animal habitat. As students follow through on the procedures, circulate and facilitate discussion about what students see. **(Planning and carrying out investigations)**
  - **Tips for running investigatory procedures:**
    - If the class does not have a procedure in place for dispersing task responsibilities, rotate task responsibilities by shifting tasks around the seating arrangement in a pre-determined direction over the course of the week.
    - Encourage students to discuss what they observe of the habitat. Explain to students that they can never know what observations could help to better understand the investigation.
      - Insect appearance, the way it moves, evidence of movement, evidence of other insect activities
- **DAY 5**
- (15 min) **Transition students to their small group seats.** Follow procedures as with days 2-4.
- (10 min) **Once final observations have been made,** students will prepare to share with the class what they observed during the week about their insect's eating habits. Encourage students to include other observations about the week if they felt they were related to the eating habits, and to think back about what they observed each day. As a part of their presentation each group will provide some answer to the question: "What does [insect type] eat?" **(Planning and carrying out investigations)**
- (15 min) **As the groups complete their discussion,** bring their focus to the front of the room. Make sure that each group has decided on a group member who will share out the results of the investigation or use classroom procedures to decide this role. Have the groups present, one by one, providing a brief period for discussion after each presentation. **(LS1.A) (Engaging in an argument stemming from evidence) (Energy and Matter)**
  - **Tips for facilitating discussion:**
    - If any groups have shared the same insects, encourage a discussion between the groups regarding similarities or differences in what they observed.
    - Engage groups in discussion of whether they think what they observed is the same as what they would see from the insects out in their natural habitat.

## FOCUS QUESTION

- How can you investigate an organism, to understand the way it behaves (e.g., what food sources will an insect choose)?

## EVALUATION

- What is a model, and how can it be used to understand a habitat?
- What are some examples of food sources that insects will take advantage of?
- Why is it important that every group performing the experiment have uniform procedures?

Based on SLIDE lesson plan format used in Krajcik, J. and Czerniak, C.M. (2018). *Teaching Science in Elementary and Middle School*. New York: Routledge.



# Bug Life: Data Recording

## Directions

### Preparation

- Place the food sources app
- Weigh the food that you will be placing in the container. Use your scale.
  - To weigh:
    - Press “tare” button. Nothing should be on the scale.
    - Slowly put the food on the scale.
      - Put honey/syrup in a small plastic container first.
    - Read the mass of the food.
    - Write the entire number on the screen in the table below.
- Place all 4 kinds of food in the insect habitat – in 4 different spots.
  - Put the honey/syrup into the habitat in the same plastic container it was weighed in.
- Spray inside the habitat with water. Make sure dirt and walls look wet, but no puddles.
- Place your bug in the habitat.
- Close the habitat so that your bug can not escape.

### Daily Instructions

- Take each food source from the habitat. Weigh them each.
- Check on the bug, make sure that it looks healthy!
- Re-spray the habitat. Make sure the dirt looks wet, but no puddles.

### Data Recording

Food	Start	1 Day	2 Day	3 Day	Final	Change
Cucumber						
Tomato						
Leaf						
Honey + container						

To get “change” subtract your final number from your start number for each food source.

*Which food had the greatest change in mass?*

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