

ANIMAL BEHAVIOR:

ISOPODS

Terrestrial isopods are commonly known as pillbugs, sowbugs, or roly-polies. These organisms are members of the Phylum *Arthropoda*, Class *Crustacea*, which also includes shrimp and crabs. Most members of this group respire through gills.

INTRODUCTION:

Ethology is the study of animal behavior. Behavior is an animal's response to sensory input and falls into two basic categories: **learned** and **innate** (inherited).

Orientation behaviors place the animal in its most favorable environment. In **taxis**, the animal moves toward or away from a stimulus. **Taxis** is often exhibited when the stimulus is light, heat, moisture, sound, or chemicals. **Kinesis** is a movement that is random and does not result in orientation with respect to a stimulus. If an organism responds to bright light by moving away or toward it, that is taxis. If an animal responds to light by random movements in all directions, that is kinesis.

Question: How does the environment direct sow bug behavior?

PART A: GENERAL OBSERVATIONS

- 1) Place 10 isopods and a small amount of bedding material in a petri dish. Isopods generally do not climb, but if they do, put the top on.
- 2) Observe the isopods for 10 minutes. Make notes on their general appearance, movements about the dish, and interactions with each other. Notice if they seem to prefer one area over another, if they keep moving, settle down, or move sporadically. Note any behaviors that involve 2 or more isopods. Try to make your observations without disturbing the animals in any way. Do not prod or poke or shake the dish, make loud sounds, or subject them to bright lights. You want to observe their behavior, not influence it or interfere with it. **Record** your observations in your lab journal.
- 3) Make a detailed **sketch** of an isopod in your journal.

You will need to draw your organism from various angles in order to record all the details.

Here are some guidelines for making an accurate sketch of your isopod, record all information in your journal:

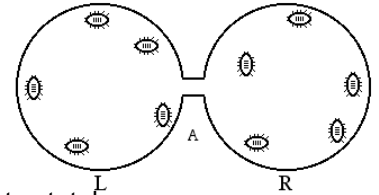
1. Determine the relative proportions
 - a. width : length
 - b. height : length
 - c. distance between eyes : width of body
 - d. length of antennae : length of body
2. Count the number of body segments
3. Count the number of legs
4. Locate the eyes
5. Label the body parts
6. Note the size of the sow bug

PART B: KINESIS IN PILLBUGS

A choice chamber is made of two or more containers that have a connection between them. This allows the model organism to move freely between the choices of environments that may be available. This allows the scientist to manipulate the environments and watch how the model organism behaves when given a choice.

The choices you will start with are moist and dry. Follow the directions below to set-up your lab for the initial observations.

- 1) Place a moist filter paper into one side of the choice chamber.
- 2) Place a dry filter paper into the other side of the choice chamber.
- 3) Place five isopods on the dry side and five isopods on the moist side.



Observations

- 1) Observe the choice chamber for five minutes.
- 2) Count the number of isopods in each dish every 30 seconds for ten minutes total
- 3) **Create a data table** in your journal to record the data collected. Continue to record even if they all move to one side or stop moving. Include qualitative data and observations.

ANALYSIS:

- 1) Make a rough sketch of your data in your journal. Share your data with the class.
- 2) Make a rough sketch of the CLASS DATA in your journal
- 3) CREATE a proper graph of Class Data for inclusion.
- 4) GRAPHING REMINDERS:
 - a. Independent variable labels the x-axis
 - b. Dependent Variable labels the y-axis
 - c. Be sure to include units in parentheses.
 - d. Title the graph using your two variables.
- 5) Explain what trends are seen in your graph and data. Include all qualitative data observed and what information this gains for you about sow bug behavior. Include whether you are seeing taxis or kinesis in your analysis.
- 6) How does your data compare to the Class Data? Why might this be the case?
- 7) **Explanation:**
Write a claim (referring back to your initial question), use evidence to support your claim (refer to data and trends), and reasoning (why did the sow bug behave that way, what physiological reasoning explains this, were you seeing taxis or kinesis and why)
- 8) If you suddenly turned over a rock and found isopods under it, what would you expect them to be doing? If you watched the isopods for a few minutes, how would you expect to see their behavior change?

PART C: Student-Designed Experiment

- 1) Investigate isopods' response to a variable(stimulus) of your choice.
- 2) Design a good controlled experiment and include procedures of how it will be conducted.
- 3) Have the experiment checked by your instructor to make sure all materials will be available.
- 4) Follow the instructor's directions on how to prepare a report/presentation of your experiment.