AP Biology Investigation #12 (modified)

Do sow bugs have a preference when given a choice of varying habitats?

**Learning Objectives
• To investigate the relationship between a model organism, (isopods), and its response to different environmental conditions
• To design a controlled experiment to explore environmental factors that either attract or repel isopods in the laboratory setting
• To analyze data collected in an experiment in order to identify possible patterns and relationships between environmental factors and a living organism
• To work collaboratively with others in the design and analysis of a controlled experiment
• To connect and apply concepts such as genetics, animal behavior, development, plant and animal structures from cells to organs, cell communication, and evolution.)**

**Designing and Conducting Your Investigation**

Design an experiment using the choice chamber to investigate the preferences of isopods to different environmental variables (factors). Create a table that includes the results comparing all of the substances you tested.

The following are questions that you could investigate; however, as you worked through the beginning of this lab, you should have developed your own question and an investigation to answer that question:

**•** Are all substances equally attractive or repellant to the isopods?

**•** Which substances do isopods prefer the most?

**•** Which substances do isopods prefer the least?

**•** Do preferred substances have any characteristic in common?

**•** What other factors might affect whether or not the isopods moved from one part of your choice chamber to another?

**•** Do you think that it is the food itself that attracts the isopods?

**•** Are there other factors in the environment that affect the choice?

**•** What factors must be controlled in an experiment about environmental variables and behavior?

**•** What is the difference among phototaxis, chemotaxis, and geotaxis? Do isopods demonstrate all of them?

**•** Does a phototactic response override a chemotactic response?

**•** Does the age of the isopod change its geotactic response?

**•** Are there other organisms that respond the same as isopods? Are there other organisms that respond differently from isopods?

**Directions:**

1. Read selected articles on the biology of sow bugs.
2. Brainstorm individually specific environmental factors (habitat elements) that you think could lead sow bugs to select one type of habitat over another in a choice chamber.
3. Brainstorm as a class specific environmental factors that you think could lead sow bugs to select one type of habitat over another in a choice chamber.
4. Notify your teacher before the end of the period about your material needs for your investigations- so they are available the next day.
5. Design an investigation to investigate this investigation question. Use the “pre- lab flowchart (AKA- PLF)” format you just learned about to communicate your understanding of your experimental design on the back of this handout. Make sure all elements are included in your PLF. Include all headings for your flowchart.
6. Run your investigation AFTER your teacher has checked of your PLF- everyone in your group needs one.

**Post investigation questions: ■■**

**Analyzing Results**

1. **Look for patterns in isopod behavior based on the number and ratio of isopods on different ends of your choice chamber.**
2. **Is the movement of the isopod based on kinesis or taxis?  What is the difference?  What evidence from your lab supports your choice in isopod orientation?**
3. **Develop a method for sharing your results and conclusions to classmates — and then share them!**

**■■Evaluating Results
1. Is there anything that was shared by all of the environmental factors to which the isopods were attracted?**

 **2. Is there anything that was shared by all of the environmental factors to which the isopods were repelled?**

 **3. How do you explain the behavior of isopods in someone’s wood pile or in nature based on the information you collected?**

 **4. Do your data explain all isopod movements? Explain your answers.**