

Animal Behavior-Inquiry Lab

(Superworms, pill bugs or crickets can also be used for this activity)

Part 1: Making an Observation

The first step of the scientific process is observing. After you receive the mealworm, record observations in your notebook. Below is a list of a few guiding questions to get you started.

- What unique factors do you notice about the mealworms?
- How does it move?
- What color is it? Be specific.
- Does it have eyes? How do you know?
- Does it have legs?
- How long is it?
- How tall is it?
- What happens when you touch it or blow on it?
- Is it a male or a female? How do you know? Can you tell?
- Use a hand lens or a stereoscope to help with your observations.
- Did using a tool (lens/stereoscope) change any of your previous observations?

Be sure you have recorded all observations in your notebook.

Research

- After recording your observations, complete research on the mealworm life cycle, habitat, feeding habits and ect....
 - Be sure to use websites that are credible (.org,.edu, .gov or usually more credible)
 - Wikipedia is a good starting point to find good sources. Scroll to the bottom of the Wikipedia page for a possible list of good sources.
- **Record your research facts in your notebook.** Be sure to include the source of the information (author, web address, date published and any other relevant information)

Part 2: Creating Testable Scientific Question

With your group/partner, come up with two testable scientific questions. Be sure your question requires testing in order to be answered. It may be helpful to begin your question with “Do mealworms prefer...”. Also, be sure your question is something you could answer with the materials available in the classroom.

- Record your questions in your notebook. Have your **teacher approve** one of your questions before moving on to the next section.

Create a Hypothesis- a proposed explanation for the way a particular aspect of the natural world functions.

Write the hypothesis as a statement based off of the question you are trying to answer.

- **Record your hypothesis in your notebook**

Part 3: Experimental Procedures

Experimental procedures need to be written so anyone trying to reproduce your experiment can replicate it.

Some important points to remember about a controlled experiment:

- 1.) You must use at least two mealworms and everything about the two mealworms and their environments should be the same **EXCEPT** for one variable that you are changing/testing (**this is the independent variable**).
- 2.) You must decide what you are going to measure. (**This is the dependent variable**).
- 3.) You have to think about how many mealworms you will use. If you only use one, you will be less sure of the answer than if you use two and they both do the same thing. The more tests, the better.
- 4.) You will need to decide when the experiment is over. How will you know when the mealworms have made their final “decision” on where they want to be or what they want to do? This must be consistent for all trials.
- 5.) Finally, you must decide how many trials you will run. If a mealworm does the behavior just once, it could be just plain “luck”. However, if a mealworm performs the same behavior 30 times or even 25 out of 30 that is more convincing. How many trials will you perform?

In your lab notebook, write down the following:

- Experimental groups (how many mealworms you are using)

- Control group (what you are comparing to, if applicable)
- Independent variable (the factor that you are changing)
- Dependent variable (what is being measured/counted)
- Constants (all factors that are kept the same)

Also in your lab notebook, include the following:

- **All materials and supplies that will be needed for your experiment (Do not leave anything out)**
- **Next, include step by step instructions on how the experiment will be performed.**

Part 4:

Data Collection and Experimentation

Assign roles within your group. You will need an experimenter, a data recorder, and observers.

You should design two data tables in your lab report. One data table should be for the **quantitative data** (numbers, etc.) that will be collected. The second should be for general observations or **qualitative data**. Have your teacher check your data table to ensure it is setup properly.

In your lab notebook, draw a quantitative data table and a qualitative table.

You should set up your experiment and run the procedure as many times as possible. **The more trials you run the more valid your results be.**

Allow time for proper cleanup!

In your lab notebook, record all data and observations for each trial in your data table.

Part 5:

Data

Set up a graph (line or bar) to help analyze the data you collected. The graph should consist of the independent variable on the x-axis and the dependent variable on the y-axis.

In your lab notebook, draw a graph that is consistent with the data you collected.

CONCLUSION

This is the most important part of the lab report. This is where you interpret your data (discuss the trends shown on the graph) and summarize your findings. Try to always include these items in your conclusion:

- 1.) A discussion on data shown on the graph. What trends do you notice, and why are they there?
- 2.) Was your hypothesis correct? Explain.
- 3.) What might you do differently if you repeated this experiment? What errors occurred during experimentation? What would you do differently if you performed the experiment again?
- 4.) Did this experiment cause you to think of new scientific questions?
- 5.) How does this relate to real world problems? Why do we care about your results?