Name: _____ Date: _____

Lab #: _____ **Biology**

Aim: How Does the Earthworm Respond to Various Stimuli?

Purpose: An organism responds to changes in its environment. Biologists refer to these adjustments as adaptations.

In this investigation, you will:
a. conduct activities that will show the earthworms' response to light and gravity.
b. observe and record earthworm behavior.
c. identify adaptations that help the earthworm survive.

Materials:

live earthworms	glass plate
dissecting tray	metric ruler
paper towels	ammonia
flashlight	vinegar
cotton swabs	textbook

Procedure:

1. Soak two paper towels in water. After squeezing the excess water from the towels, line the bottom of a dissecting tray with them. *It is very important to keep the towels and the earthworms moist. If the earthworm dries out, it will die.

2. Examine each end of the earthworm. Find the anterior or head region of the earthworm. The bandlike structure is known as the clitellum. How can you differentiate the posterior region of the earthworm from the anterior? Use drawings as well as a verbal explanation. _____

_____

_____

3. Determine the dorsal and ventral surfaces of the earthworm. How do they differ from one another? _____

_____

4. Measure the length of the earthworm in centimeters. _____ cm

5. Predict how the earthworm will respond when you touch it. _____

_____

Lightly touch the front of the earthworm. Record the earthworms' responses:

Repeat this procedure but touch the posterior end of the earthworm. After recording your observations, touch the side of the earthworm and record your observations.

posterior:_____

side: _____

6. Cover the earthworm with a damp paper towel and let it rest for a few minutes. Raise the towel and shine a flashlight on the anterior (front) end of the earthworm. What was the response of the earthworm?_____

_____

7. Cover the worm with a damp towel and let it rest again. Repeat procedure 6 but shine the light on the earthworm's posterior (rear) end. How did the worm respond? _____

8. Gently move the earthworm to a glass plate. How does it move when on the plate? _____

_____

Explain why there is a difference in the worm's ability to move on the rough paper and on the glass plate. _____

_____

_____

Place the earthworm back on the moist towels, cover it and allow it to rest for a few minutes.

9. Create a ramp by placing the dissecting tray at an angle against your textbook. Position your worm so it is in the middle of the tray and its anterior end is facing the high end of the tray. After two minutes, record the position of the earthworm.

_____

_____

After allowing the worm to rest, place the posterior end of the worm facing the high end of the tray. After two minutes, record the position of the earthworm. _____

_____

Allow the worm to rest for a few minutes.

10. Dip the cotton swab into some ammonia. Hold the swab close to the front end of the earthworm but DO NOT touch the worm with it. How does the earthworm respond? _____

_____

Cover the worm with damp paper towels and allow it to rest.

11. Repeat procedure 10 using a swab dipped in vinegar instead of ammonia. Record your observations. _____

_____

12. Put the earthworm back in its container and clean up.

Conclusion Questions:

1. Which part of the worm responded most to touch?_____
How did your observations compare with your prediction? _____

_____

2. Explain how the earthworm's behavior is influenced with light as a stimulus at its
a) anterior end:_____

b) posterior end: _____

3. Based on your answer to question 2, offer experimental evidence as to whether all areas of the earthworm's body respond equally to light?

_____

_____

_____

4. Why do you seldom see earthworms on the surface of the ground during the day? _____

How is this an adaptation for survival? _____

_____

5. Provide an explanation for the earthworm's response to gravity.

_____

_____

_____