

## Lab #3

Name \_\_\_\_\_

# Investigating life

### Purpose:

In this lab we will be using our science process skills to identify characteristics associated with life. We will also accurately measure mass and length using metric measurements and organize and analyze data to determine living from nonliving objects. We will find out if a gummy worm, a real worm, and a plant are living.

### Hypothesis:

If we try to find the 7 characteristics of life in certain objects, then we will know if an object is living, because all living objects have all 7 characteristics.

### Materials:

- Gummy worm
- Earthworm
- Coffee filter
- Metric ruler
- Forceps
- Magnifying glass
- Triple beam balance
- Paper towels
- Diagram of earthworm parts
- Gloves
- Sand paper
- Lilies
- Sugar solution
- Stirring rod
- Microscope
- Light source
- Colored pencils

### Procedure:

1. Examination of a Gummy worm
  - a. Get a gummy worm and make a detailed drawing of it using your colored pencils
  - b. Assign your worm a scientific name
  - c. Measure its length width and mass put measurements on table 1
  - d. Count and record the # of segments
  - e. Observe odor and elasticity of gummy worm
  - f. Gently touch worm and record what happens
  - g. Record any other observations
2. Examination of a earthworm
  - a. Moisten a paper towel and put it on a clean dissecting pan
  - b. Place the worm on the paper towel
  - c. Watch the worm move
    - i. The end that leads is the anterior end
    - ii. The back is the posterior end
  - d. Place the worm ventral side up what does it do?
  - e. Find the citellium of the earthworm near segment # 32 why do all earthworms have a citellium?

- f. Locate the setae of the worm and find out how many pairs are on each segment
  - g. Cover the beam of a flashlight with colored cellophane and shine it on the worm, write observations on table 2
  - h. Shine the light on each part of the worm and see how it reacts
  - i. Shine the light on one area of the dissecting pan and see if the worm will enter the spotlight
  - j. Place a dry towel next to the wet towel and see which one the worm prefers why does it prefer the towel it went to?
  - k. Place a piece of sandpaper next to the dry towel and see which one the worm prefers
  - l. Look at the dorsal side of the worm you will see a thick purple line running down the whole worm
  - m. Put cool tap water in a petri dish with the worm
  - n. Observe the rhythmic contractions of the dorsal aorta through a stereomicroscope this is the worms heart rate
  - o. Count the # of contractions in one minute
  - p. Do the same with warm water (NOT HOT!!!)
  - q. Record data
  - r. Return earthworm to container
  - s. Throw away paper towels
  - t. Rinse dissecting tray and return it to the counter
3. Examination of a plant
- a. Observe your flower with a magnifying glass
  - b. Write 3 observations of your flower
  - c. Carefully take the flower apart and set the pieces on a sheet of paper towel
  - d. How many colored petals are present? What advantage does this give to the flower?
  - e. How many sepals are around the flower? What is the function of the sepal?
  - f. Locate the pistil and describe its function
  - g. Find the stamen
  - h. On the tops of the stamen there are structures what are they and what do they do?
  - i. Put a drop of sugar solution on a microscope slide
  - j. Remove an anther and place it in the solution
  - k. Stir with a stirring rod
  - l. Remove anther and study slide under a microscope
  - m. What are you looking at?
  - n. Using a scalpel cut open the ovary of the flower
  - o. Ask teacher for directions
  - p. If the flower is mature you may see chambers
  - q. Clean up

**Results:**

	Mass	Length	Width	# of segments	Odor	Other
Redormges wormos (gummy worm)	5g	5.5cm	1cm	10	Sweet	Stretchy squishy
Earthworm	4g	15cm	1cm	150	dirt	Pink

**Table 2**

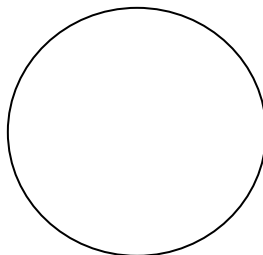
Environmental stimulus	Response
Placing ventral side up	Tries to turn back over
Touching of setae	Nothing
Colored light	Moved away
White light to anterior	Moved away
White light to midpoint	Moved away
Moist/dry environment	Goes to wet
Sandpaper/smooth surface	Goes to sandpaper

**Table 3**

Characteristic	Gummy worm	Earthworm	Lily
Cellular organization	No	Yes	Yes
Homeostasis	Yes	Yes	Yes
Metabolism	No	Yes	Yes
Responsiveness	Yes	Yes	Yes
Reproduction	No	Yes	Yes
Heredity	No	Yes	Yes
Growth and development	No	Yes	Yes
Is it alive?	No	Yes	Yes

When we placed the earthworm ventral side up it tried to turn back over because to the earthworm it was upside down. All earthworms have a clitellum because they are hermaphrodites. There are 2 pairs of setae on each segment. Every time we shined the light on the earthworm it tried to move away, this sensitivity to light might have caused earthworms to live underground. Our worm moved towards the wet towel because a dry worm is a dead worm. Our flower was yellow, it had veins going to the tips of the leaves, and the petals were soft. Our flower had 3 colored petals; this gives this flower an advantage because bees like bright colors. Our flower had 3 sepals the function of a sepal is to protect the flower. The pistil of the flower is the female reproductive system. Around the pistil there are stamens these have structures on top of them called anthers that produce pollen. When we looked through the microscope at the sugar solution we were looking at pollen.

Side view of ovary



**Conclusion:**

In this lab we used our science process skills to identify characteristics associated with life. We also accurately measured mass and length using metric measurements and organized and analyzed data to determine living from nonliving objects. We find out a gummy worm is not living and that a real worm and a plant are living. When we placed the earthworm ventral side up it tried to turn back over. Every time we shined the light on the earthworm it tried to move away. Our worm moved towards the wet towel. Our flower had 3 colored petals and 3 sepals. I accept my hypothesis because we tried to find all 7 characteristics of life in the earthworm, the gummy worm, and the lily. As table 3 shows the earthworm and the lily have all 7 characteristics of life and they are living. The gummy worm only has 2 characteristics and it is not. I think the worm went to the moist side because if a worm dries out, it dies. I do not know why the worm went to the rough side but I think it has something to do with the roughness of the soil. The gummy worm the earthworm and the lily are similar because they all resemble, or are living things. All of these objects are also similar because they each have some, or all of the characteristics of life. These objects are different because the earthworm and the lily are alive and the gummy worm is not. The gummy worm has only 2 characteristics of life homeostasis and responsiveness. The earthworm and the lily have all of the characteristics. I do not think we had any problems or mistakes in this lab everything went smoothly. I have full confidence in my results. The only limitation of the investigation was that we only had three objects to observe. In this lab I learned what an anther is and what it produces. I also learned that gummy worms have 2 of the 7 characteristics of life. I want to know what other non-living things have some of the characteristics of life. I also want to know what they put in the gummy worms that make them stretchy and squishy. I think if we did more examples of non- living things or living things I would understand more.