

Activity 4 (4th Grade)

Ecosystems and Animal Behavior—Follow-up Activities

In the 4th science workshop we examined the *BEHAVIOR* of earthworms when they were exposed to different experimental treatments. We also learned about the “parts” of an ecosystem.

Use the data in the **TABLE** below to complete the table and answer the questions that follow. Data from three 4th grade classes are presented.

Earthworm Experiments	Combined Class Data 3 classes [<i>check mark (✓) indicates data point for one worm</i>]		
	Number on dark side of chamber	Number on light side of chamber	TOTALS
Response to white light	✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓✓✓✓✓✓✓ ✓	✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓	Dark: _____ Light: _____
	Number on dry side of chamber ✓✓✓✓✓✓✓✓	Number on moist side of chamber ✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓✓✓✓✓✓✓	Dry: _____ Moist: _____
Response to odor	Number on ammonia side of chamber ✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓✓✓✓✓✓✓ ✓✓	Number on water side of chamber ✓✓✓✓✓✓✓✓✓✓ ✓✓✓✓✓✓✓✓✓✓ ✓	Ammonia: _____ Water: _____

- TALLY** the total number of worms found in each experimental treatment. Place your answers in the spaces provided in the table.
- In which experiment did the earthworms show the strongest response to the choices they were given? _____
 Did the worms prefer the dark side of the experimental chamber or the light side? _____
 Do worms have a strong preference for either the smell of water or ammonia? _____
- The table above summarizes **DATA** from three classes—a total of 48 worms was used in each experiment. Examine the data in the “TOTALS” column. How many worms appear to be missing from the **LIGHT/DARK** experiment? _____ the **MOIST/DRY** experiment? _____ the **ODOR** experiment? _____

4. Give at least one reason why we did not have data for 48 worms in all experiments?

5. **Vocabulary** (match the words and definitions by filling in the blank with the appropriate **letter**)

A. Community	_____ A body part or a behavior that helps an organism meet its needs
B. Adaptation	_____ Animals lacking backbones or spinal columns, such as worms, mollusks, insects, and spiders
C. Invertebrates	_____ Different species of plants and animals living in the same ecosystem
D. Behavior	_____ The pathway by which organisms obtain, use, and transfer energy
E. Food chain	_____ (Example— plants are eaten by a grazing animal, and a larger predator eats the grazer; grass→rabbit→bobcat)
	_____ The way that animals react to situations in their environment

6. Name two of the **INDEPENDENT** variables (also called **MANIPULATED** variables) that we changed in these experiments? _____

7. What was the **DEPENDENT** variable (also called **RESPONSE** variable) that we measured in these experiments?

8. Based on what we discovered about earthworm preferences in these experiments, rank the following habitats from **1** to **4**, with 1 the “best, most likely place to find earthworms,” 2 the next best, 3 a relatively poor worm habitat, and 4 the worst worm habitat.

- _____ Dry sandy soil in open sunlight
- _____ Somewhat moist cool leaf litter
- _____ Rich, moist, earthy-smelling organic soil in a shaded forest
- _____ Very wet waterlogged clay soil

9. **Bonus**—Can you represent the results from the light experiments in the form of a circle graph (pie chart)? Do your calculations and draw it in the space below. *Hint: your circle graph should having three sections—one that represents the percentage of worms that chose the “dark” side, one section that represents the percentage that chose the “light” side, and one that represents the “missing” worms.*