**How Do Mealworms Behave In Response To Stimuli?**

**I. Introduction**

 Mealworms are useful for studying animal behavior because they are relatively easy to manage, and they respond to many types of stimuli. A stimulus is anything in the environment to which an organism reacts. Mealworms are also excellent for studying innate behaviors of animals. Innate behaviors are those that are inherited rather than learned. Innate behaviors are important to an animal’s survival.

 Animals have two types of innate behaviors : reflexes and instinctive behaviors. The simplest innate behaviors are reflexes. Reflexes are automatic, immediate responses to stimuli. For example, blinking when an object flies toward your face is a reflex. All animals have reflexes. During a reflex, a message passes from a sense organ along the nerve to the spinal cord and back to the muscles. The message does not go to the brain.

 Instinctive behaviors are patterns of innate behavior that have evolved within an animal species over many generations. Instinctive behavior begins when the animal recognizes a stimulus and continues until all parts of the behavior have been performed. For example, salmon swimming upstream to spawn is a behavior that has allowed this species to survive and produce offspring. Salmon instinctively display this behavior. They do not need to learn it.

 In this Exploration you will predict, observe, and describe the responses of mealworms to various stimuli. You will also classify behaviors as reflexes or instinctive behaviors.

**II. Procedure**

 1. Start the activity by going to the following website :

<http://glencoe.mheducation.com/sites/dl/free/0078802849/383957/BL_19.html> .

 2. Click the “Play” button on the video controller to watch an introductory video about

 mealworms. Click the “Pause” button to pause, the “Rewind” button to go back a few frames,

 the “Fast Forward” button to go forward a few frames, and the “Stop” button to rewind to the

 beginning of the video.

 3. Click the file tab to select a stimulus to examine.

 4. Read the Stimulus Question on the file card. Predict how the mealworm will respond to the

 stimulus.

 NOTE : Your predictions will not be evaluated. Making predictions is part of the scientific

 process. Proving or disproving hypotheses is a way in which important scientific discoveries

 are made.

 5. Drag one of the three responses to the Predicted Behavior area. Enter your prediction in the

 Table.

 6. Click the “Play” button on the video controller.

 7. Watch the video to see how the mealworm responds to the selected stimulus.

 8. Drag the response that corresponds to the mealworm’s actual behavior to the Actual Behavior

 area. Record the actual response in the Table.

 NOTE : When you click a new file tab, data from the previous file card will be erased.

 9. Repeat the Virtual Lab until you have observed mealworm’s responses to four different

 stimuli.

 10. Click the “Reset” button to obtain a different set of stimuli.

**III. Data**

 1. Record your data in the Table below.

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| --- | --- | --- | --- |
|  **Stimulus** **Applied** |  **Predicted** **Behavior** |  **Actual** **Behavior** |  **Type Of** **Behavior** |
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**IV. Analysis & Conclusions**

 **1. What is the difference between a reflex behavior and instinctive behavior? Describe**

 **reflex behaviors and instinctive behaviors that humans possess.**

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 **2. Which mealworm behaviors were reflexes? Why?**

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 **3. Which mealworm behaviors were instinctive? Why?**

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 **4. How did the mealworm respond to food as a stimulus? What type of behavior is**

 **displayed in the mealworm's response to food? Why is this behavior important?**

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 **5. How did the mealworm respond to cold water as a stimulus? Was the response**

 **behavioral or metabolic?**

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