

Details



Completion Time: 1 period

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Animal Monitoring Introduction

Overview

Students will conduct quantitative and qualitative observations on living organisms. By recording careful measurements, making and testing various hypotheses, on super mealworms, students will gain some understanding of how wildlife researchers conduct their studies.

Objective

Students learn to take measurements on living organisms and use those measurements to consider the health of the organisms. Students will make and test hypotheses and discover how difficult it can be to accurately predict the behaviour of these organisms.

Lesson Preparation

Discussion about what is known about some animals. Examine PolarTREC website, Greenland Seabird Ecology, to observe how research was conducted on an arctic seabird, the Little Auk (*Alle alle*). Have students generate a list of methods used during the Little auk field research.

Procedure

1. Students look over data sheet and read each step.
2. Hand out mealworms; one per pair of students.
3. Students observe mealworms for one minute, recording movements.
4. Students write detailed description of mealworm.
5. Students take measurements using care to protect the larvae; mass, length, circumference.
6. Pick one surface and take back to table. Record a hypothesis about how the mealworm will react to being placed on this surface.
7. Observe for one minute, record observations.
8. Repeat with additional surfaces.
9. Pick one food. Record a hypothesis about how the mealworm will react to this food.

Materials

- Super mealworms- 1 per pair of students (available at most pet stores, look for active ones)
- Triple beam balance or scale to find mass of each larvae
- Metric ruler
- 4-5 surfaces to test mealworm reaction
- 4-5 food items to test mealworm reaction



10. Place mealworm on or next to the surface and record observations for one minute.
11. Repeat with additional foods.
12. Put two mealworms together, make a hypothesis and record observations of interactions.
13. Clean up lab stations. Answer all questions.

Extension

N/A

Resources

Background information about mealworms <http://insected.arizona.edu/mealinfo.htm>

Assessment

Examine worksheet, monitor engagement, conduct formative assessment while activity is occurring.

Credits

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National Science Education Standards (NSES):

Content Standards, Grades K-4

Content Standard A: Science As Inquiry

- a. Abilities necessary to do scientific inquiry
- b. Understandings about scientific inquiry

Content Standard C: Life Science

- a. Characteristics of organisms
- b. Life cycles of organisms
- c. Organisms and environments

Content Standard F: Science In Personal and Social Perspectives

- b. Characteristics and changes in populations
- d. Changes in environments
- e. Science and technology in local challenges

Content Standard G: History and Nature of Science

- a. Science as a human endeavor

Other Standards:

California Science Standards

US.CA Life Sciences-grade 3

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

- a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
- b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
- c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

Investigation and Experimentation

5. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

- a. Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.
- b. Differentiate evidence from opinion and know that scientists do not rely on claims or con-



clusions unless they are backed by observations that can be confirmed.

- c. Use numerical data in describing and comparing objects, events, and measurements.
- d. Predict the outcome of a simple investigation and compare the result with the prediction.
- e. Collect data in an investigation and analyze those data to develop a logical conclusion.

Mealworm Observation Sheet

Organism #1 _____
Scientific name _____

Measurements
Length _____
Width _____
Mass _____

Test #1 Basic Behavior Monitoring
Hypothesis:

Observations:

Test #2 Reaction To Surface Textures
Surfaces Being Tested:

_____, _____, _____, _____

Hypothesis:

Observations:

Test #3 Food Preference
Foods Being Tested:

_____, _____, _____, _____

Hypothesis:

Observations:

Test #4 Social Contacts

Pair with another pair of students

Hypothesis

Observations

Conclusion: Please answer on a separate piece of paper.

1. How were your hypotheses different from the actual behaviors?
2. How were they similar?
3. What is the purpose of weighing the mealworms?
4. As a class, find the mean mass, length and circumference. Compare your mealworm to the mean. Is it one of the bigger or smaller ones? Is it 'healthy'?
5. How was this similar to what wildlife scientists need to do to find out about wild animals?
6. How is it different?

Extensions:

List some animals that might be found in your neighborhood or yard.

List possible behavior studies you might conduct.

What pets do you have?

How could you study their behavior?

How could you test their behaviors?