

Birds and Bugs: Why Blending is Beneficial

THEME

Use of scientific data collected from a test of insect camouflage can help make technological exercises more meaningful.

VOCABULARY

Data, line graph, bar graph, pie chart, spreadsheet, database, analysis, hypothesis, scientific method, camouflage

ACTIVITY MATERIALS

www.butternutvalleynaturecenter.com/ComputerActivities.htm

INTRODUCTION

Preview the main points of the activity and conversationally restate the theme. Explain that scientific methodology includes the following steps:

- Make an observation
- Ask a question
- Form a hypothesis
- Test the hypothesis (data collection)
- Analyze the data
- Form a conclusion
- Communicate the results

ACTIVITY

Direct students to the web exercise. The activity is has two parts, the animation and the simulation. The animation will give a brief description of the benefits of camouflage with a video of a green praying mantis clinging to green vegetation. After the video, six images will be displayed for the students to find the camouflaged organism. A hint bubble will give them the correct location. At the end of the animation, the students will be directed to the simulation exercise by clicking the provided link. The exercise will allow the students to collect data regarding biological camouflage just described to them. They will follow six steps while using scientific methodology. The simulation will show several robins eating bugs. There are 20 green bugs and 20 brown bugs. The student can choose one of three different backgrounds: dirt, grass, or pavement. After the student clicks the “Test” button, the simulation will run and the robins will eat the bugs. When the test is done, the students will count the number of green bugs and the number of brown bugs left. They will record their data in a spreadsheet and run the test with the same background twice more. They will calculate the average number of bugs for each bug color using a spreadsheet or database. The student will then use their averages to create a

Teacher’s Corner

Grade Level(s)

5th Grade

Time

15 - 20 minutes

Learning Expectation(s)

3.1: Students will use technology tools to enhance learning, increase productivity, and promote creativity.

3.2: Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.

5.2: Students will use technology tools to process data and report results.

6.1: Students will use technology resources for solving problems and making informed decisions.

State Performance Indicators (SPIs)

- Use subject specific information gathered through technology resources for a variety of curriculum subjects.
- Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
- Recognize that different software programs are designed for specific purposes.
- Synthesize information using word processing, databases, and/or spreadsheets.
- Use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia.

Birds and Bugs: Why Blending is Beneficial

ACTIVITY (cont.)

graphic description of their results and discuss them with the class.

The students should use the scientific method while performing the exercise. For example:

- Observation – some bugs blend into their background.
- Question – would this camouflage help them to survive?
- Hypothesis – the green bugs will have a better chance of surviving in the grass than the brown bugs.
- Test – Run the test and collect the data.
- Analyze – create a spreadsheet and calculate averages.
- Conclusion – the green bugs were more likely to survive in the grass than were the brown bugs.
- Communicate results – present the results to the class and discuss that the green bugs blended into the green grass and therefore the birds could not find them to eat as easily as they could find the brown bugs.

DISCUSSION

During the discussion of results, encourage the students to talk about why they think certain bugs survived better with certain backgrounds. It is during this stage that more observations and questions can be posed for a new hypothesis and subsequent testing. For example, a student may calculate that the green bugs survived better in the green grass than did the brown bugs. The student may then observe that the brown bugs match the color of the dirt background and might therefore be more likely to survive there. They would then develop the question, “Are brown bugs more likely to survive in the dirt than the green bugs?” They could then test the hypothesis, “Brown bugs have a better chance of surviving in dirt than do green bugs”. Alternatively, they may poll other students in the class that used the dirt background in the test. This would simulate scientists using research results from published literature in scientific journals.

ENRICHMENT

Have the students present their conclusions using PowerPoint or similar software. The presentation should include the graph, table, or chart depicting their results and may also include an introduction with information gathered by researching the topic of biological camouflage.

OR

Have the students use the scientific method to test the same principle of camouflage but change what they are testing. Instead of testing the survival of the green against the brown bugs on one background, use a different background for each test. An example hypothesis would be, “The green bugs are more likely to survive in the green grass than they are in the dirt or pavement”.

ACKNOWLEDGEMENTS

- Copyright © 2008 Healing Stones Foundation. All rights reserved.
- Activity developed by Allison Mains; July 2008.
- Model developed by Thomas Jones; July 2008, in the Netlogo programming environment (Wilensky, 1999).
- Wilensky, U. 1999. NetLogo. <http://ccl.northwestern.edu/netlogo/>. Center for Connected Learning and Computer-Based Modeling, Northwestern University. Evanston, IL.