
Inquiry Learning: *What's Your Favorite Color?*

Activity Overview

Students conduct research with colored plastic bowls

Objectives

Students will: learn a simple experimental procedure, ask questions, collect, interpret and present data

Subjects Covered

Science, Math, Language Arts

Grades: 5 through 12

Activity Time: 20 mins. discussing and outlining experimental procedure; 20 mins. students ask questions, devise procedure; 20 mins. set up for data collection; 1-2 days to conduct experiment; 20 mins. to collect data; 20 mins. to interpret data; 40 mins. to design report; 10 mins. to present findings.

Season: Spring, summer, fall

Materials

For collecting:

- Solo bowls- 6 ozs. or smaller is better
- Tap water is fine
- Dish soap (unscented)

For Sorting:

- Notebook
- Sorting tray
- Tweezers

State Standards

Science:

Use scientific equipment (C.4.4)

Use data to answer questions (C.4.5)

Communicate results (C.4.6)

Support conclusions with logic (C.4.7)

Ask new questions (C.4.8)

Identify questions using available resources (C.8.1)

Design and conduct investigations (C.8.3)

Use inferences and observations (C.8.4)

State learning from investigations (C.8.6)

Explain data & conclusions (C.8.7)

Background

Inquiry in schoolyard restorations need not be “rocket science.” This activity attempts to demystify the process with materials available in any discount store or supermarket.

What animals are most abundant in your schoolyard habitat? On pristine grasslands or woodlands of thousands of acres, it's likely you could monitor large animals like buffalo, deer or fox. As your habitat gets smaller, larger animals are probably no longer present. It's guaranteed that insects will represent the most diverse fauna of your schoolyard habitat, and there are many ways to sample them.

Activity Description

One way to sample insect populations and diversity is to use colored bowls called “pan traps.” These bowls come in a variety of colors and allow for a multitude of questions to be asked by researchers of every age.

Basic set up procedure for a “pan trap”: place water in the bottom of the bowl, add a few drops of unscented liquid soap to the water, to break the surface tension.

Why color? Color (and smell) are utilized by flowers to attract organisms such as insects for pollination. These bowls come in a variety of colors, sample a few colors at a time.

Things to sample: Types of insects, number of insects, color associations by insect families/orders, and phenology. There are many more, but let your students develop their own questions

1. Discuss how scientists work and that students can be the scientists in this activity.
2. Outline a simple experimental procedure:
 - a. Ask a question (hypothesis).
 - b. Devise a procedure for collecting data (What are the variables?).
 - c. Conduct the procedure.
 - d. Collect the data.
 - e. Interpret the data.
 - f. Draw conclusions (answers).
 - g. Report results.
 - h. Suggest next steps for further research.
3. Orient students to the materials and how to use them.
4. Let groups of students devise their own questions (hypotheses).
5. Students use steps in #2 to design, conduct and report on their experiment.

Inquiry Learning: *What's Your Favorite Color?* (cont)

Evaluate questions, hypotheses, conclusions (C.8.9)

Discuss results (C.8.10)

Identify further questions (C.8.11)

Ask questions, build hypotheses, design investigations (C.12.1)

Identify issues, questions, research; design & conduct investigations (C.12.2)

Evaluate data (C.12.3)

Choose & evaluate data collection methods (C.12.4)

Use explanations & models to describe results (C.12.5)

Present results (C.12.6)

Explain data & conclusions (C.8.7)

Math:

Work with data in real-world situations (E.4.1, E.8.1, E.12.1)

Describe a set of data (E.4.2)

Use graphs, tables, or charts (E.4.3)

Determine if future events are likely or unlikely to occur (E.4.4)

Predict outcomes & test predictions using data (E.4.5)

Organize & display data from statistical investigations (E.8.2, E.12.2)

Analyze information from organized & displayed data (E.8.3, E.12.3)

Use results of data analysis (E.8.4)

Compare several sets of data (E.8.5)

Evaluate presentations & statistical analyses from a variety of sources (E.8.6)

Determine the likelihood of occurrence of simple events (E.8.7)

Organize & display data from statistical investigations (E.12.2)

Analyze information from organized & displayed data (E.12.3)

Analyze, evaluate, and critique statistical experiments in reports (E.12.4)

Determine the likelihood of occurrence of complex events (E.12.5)

Source

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Notes:

Make it clear that *simplicity* is useful in this introductory learning process. Present the materials and basic idea, but let the *students do the thinking, ask the questions, devise the procedure.*

The materials help to limit the scope and complexity. Shorter time frames can also be useful ---a few hours, overnight, two days.

It is not necessary to identify individual species or know all of the names, just that the insects are different. However, it's student driven so if they want to know more, let them find out!

Extensions

- Students present their results in a mini-research symposium.
- Repeat the experiments with different variables, questions.
- Design additional experiments using the process above.

Additional Resources

- Section 6 in the EPS Resource Binder: Inquiry Learning

Website

- <http://www.eman-rese.ca/eman/ecotools/protocols/terrestrial/arthropods/pan.html>