



University of Kentucky Entomology
Insects in the Classroom Lesson Plan No. 103

Termite Trails

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Activity Description

Hands-on Discovery Lab

Age Group: Can be adapted for elementary through high school.

Class Time: One class period (55 minutes)

Objectives

- ⌘ Students will observe the behavior of termites and draw conclusions about their behavior.
- ⌘ Students will record data as to termite behavior.
- ⌘ Students will analyze data and discuss in a summary their results.

Academic Expectations

The above objectives fall under the Science Expectation or at least part of it.

- ⌘ 2.1 Understand scientific ways of thinking and working and use of those methods to solve real-life problems.
- ⌘ 2.2 Identify, analyze, and use patterns such as cycles and trend to understand past and present events and predict possible future events.
- ⌘ 2.3 Identify and analyze systems and the ways their components work together or affect each other.
- ⌘ 2.4 Use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.



Termites

Background information:

Termites are small, soft bodied, usually pale-colored insects. These are social insects with a caste system. They live in colonies in the ground or in wood. Their food consists primarily of wood or other vegetable material. The workers are sterile and lack compound eyes. They do the main work of the colony—

collecting food, feeding the queen, soldiers, and young as well as constructing galleries. Many species cause considerable damage to buildings, furniture, utility poles, fence posts, and other materials. In addition, termites are important decomposers breaking down dead trees and other plant materials into nutrients useful to plants. The cellulose in the termite's food is digested by protists living in the termite's digestive tract. This association is an excellent example of symbiosis or mutualism.

Termites frequently groom each other with their mouthparts, a result of the attraction of secretions that are usually available on the body.

Scientific Inquiry

This lab is useful in introducing the scientific method or reinforcing it. It could be set up to be very structured or used as a discovery lab with few instructions.

Termites are attracted to the ink in Papermate ballpoint pens but not those of rollerballs or felt tips. They seem to respond to other ballpoint pens but will not respond to all inks. What happens, is the termites will follow whatever design is



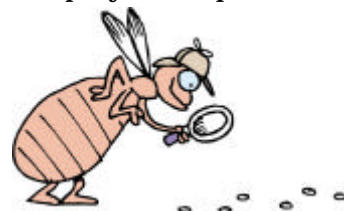
drawn as long as the lines are heavy and well spaced.

Figure eight works well but testing different designs may be part of the investigation.

It turns out that the ink in the Papermate ballpoint has a substance that resembles pheromones that the termites recognize.

Discovery Lab

Use a blue Papermate pen and another blue pen to which the termite will not respond. Ask "Why does this happen?" and then let the students experiment with different inks, pencils and designs. Record the data as a class or in groups and have students try to determine **why** this happens. They may make predictions about different ink pens or different colors. Students will need to do research on termites to realize that color will have no effect because as stated before these workers have no eyes (that's why pheromones play an important role in their society)



More Structure?

For a more structured lab the procedures that follow can be used or adapted to your classroom needs.

(Student Handout)

Name _____

TERMITE TRAILS

Problem: Observe the behavior of termites and make conclusions about their behavior.

Materials: Petri dish, Paper, Papermate ballpoint pen, rollerball pen, Termites, forceps (tweezers), other pens and pencils, colored pencils, and scissors.

Procedure:

1. Cut a piece of paper to fit the inside of your petri dish.
2. Draw a large figure eight on the paper with the Papermate ballpoint provided (go over it several times with the pen) and place the paper in the petri dish.
3. Using forceps, CAREFULLY place a termite on the paper and observe its behavior.
4. Make a chart or table to record your data. Use the following: (termite responds) +, (no response) 0, (termite avoids the markings) –
5. Repeat steps 1-4 using the rollerball pen provided.
6. Now, suggest a hypothesis to be tested in an experiment. Use the other side of this paper to write down your hypothesis.
7. Test as many other pens and pencils as available and record your data in the table that you have made.
8. Test different designs drawn.
9. Make conclusions about your observations and give a scientific explanation as to why the termites respond as they do.

(Student Handout)

Scientific Method Format

Observations:

Hypothesis:

Variables to be tested:

Control group:

Chart your data (response) +, (no response) 0, (avoidance) -

| Type of writing instrument | Response + | No Response 0 | Avoidance - |
|----------------------------|---------------|------------------|----------------|
| | | | |

Conclusion: Did your results support or refute your hypothesis?

Termites can be found in decaying logs and stumps in wooded areas. When it gets too dry, the termites burrow deep into the soil looking for moisture so may be difficult to locate. They may also be ordered from Carolina Biological Company or possibly a local exterminator may be able to provide a supply. They may last a few weeks if they have wood and are kept moist. They may be kept indefinitely with very low maintenance making observations on new broods.

References and Resources

This lab on Termite Tracking was adapted from one created by Lana Hayes of Simon Kenton High School in Independence, Kentucky.

Carolina Biological Supply Company
2700 York Rd.
Burlington, NC 27215-3398
Telephone for Orders: 1-800-334-5551
Fax: 1-800-222-7112
Technical Support: 1-800-227-1150

Wards Natural Science Establishment, Inc.
P.O. Box 92912
Rochester, New York 14692-9012
Customer Service and Ordering Telephone:
1-800-962-2660
Fax Ordering: 1-800-635-8439
Catalog Request Only: 1-800-892-3583

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