
Environmental Scientist

Overview:

This lesson and activity are designed to give students hands-on experience collecting and recording entomology data.

Grade: 5

TEKS

Scientific processes

5.1(A)

5.2(A,B, C, D, E)

5.4 (A)

Science Concept

5.5 (A, B)

5.9 (A,B)

Literature

Miss Spider's Tea Party Bugs!

Vocabulary

Adaptation

Entomologist

Head

Thorax

Abdomen

Pheromone

Materials

Discovery Book

Compass

Thermometer

Field Guides

Ziploc Baggies

Hand Lens or Loupe

Trapper Insect Traps

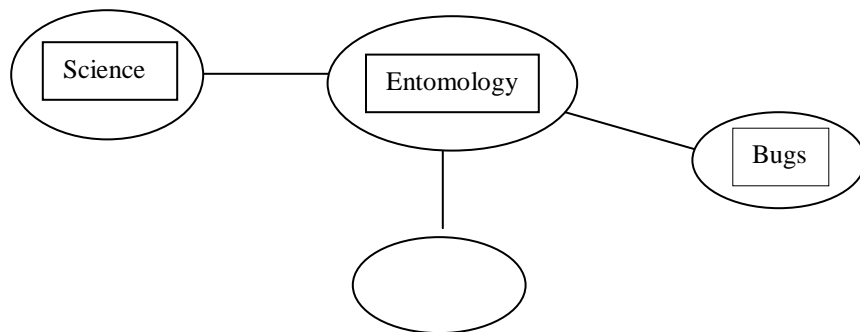
Bugs Don't Bug Me

Classroom Activity

1. Contact a local pest control company and ask for or purchase 15 to 20 "Trapper Monitor & Insect Traps." The traps are generally used by pest companies to monitor insect activity after spraying a home or business. They are excellent to use in the classroom or around the school grounds for insect experiments.



2. Introduce this entomology lesson by writing the word "entomology" on the overhead. Explain that entomology is the study of insects and that the class will extend this unit with a field trip to the Eastman Nature and Wildlife Habitat Center. Using a permanent marker, create a concept map as your students explain what they know about entomology. Date and save the transparency for the post evaluation.



3. Divide your class into "Entomology Teams" and give each team 4 "Trapper Monitor & Insect Traps." Each entomology team's objective is to answer the following question. What kinds of insects are at my school? Explain to your students each team will design their own experiment and share the scientific results with the other "entomology teams."
4. Explain to your students that scientists use a specific method to answer questions. Introduce the concept of scientific method to the class and explain that each team is responsible for following the scientific method.

Scientific Method

Question: What kinds of insects are at my school?

Gather Information: Explain the method used to collect information. This should be a good explanation of how the experiment was set up, timelines, and collection procedures.

Hypothesis: Your best guess based on initial information.

Results: After completing the experiment, identify and list specifically what insects were collected in each trap?

Conclusion: A statement, with specific details, that answers the original question.

5. Have the entomology teams number each trap and put a small amount of bait (cheese, meat, jelly) on the traps. One trap needs to be the "control" and should not have any bait placed on the trap. Have your entomology teams go around the school and set out their traps. Hang some of the traps from trees to collect a sample of flying insects too.
6. After a predetermined amount of time (1 day, 3 days or 1 week), have each team collect their traps and return to the classroom. Make copies of the "Bug Report" and have each team complete the form. There is some information on the report your students may not understand. For example, "Insect Orders" may be a new concept for your students. Explain that scientists divided insects into different groups or Orders. For example, flies are in the Order of "Diptera", beetles are in the Order "Coleoptera", and butterflies and moths are in the Order "Lepidoptera".
7. Use an Insect Guide to identify the different insects or use the Insect Identification Key on-line at <http://www.insectidentification.org/insect-key.asp>
8. After completing the "Bug Report form, have each entomology team produce the following:
 - Pie chart that represents the percentage of the Insect Orders collected.
 - Bar graphs for each trap that represent the total number of each Order collected.
 - Bar graph that represents the total number for each Order collected during the experiment.

9. Continue exploring the insects with a hand lens or loupe. Ask your students to examine the insect's head, thorax and abdomen and draw a picture of each.
10. Prior to visiting the Eastman Nature and Wildlife Habitat Center, take your class on a virtual tour of the Eastman nature trail at <http://www.eastman.com/EastmanOutdoors/trail.htm>. The trail guide developed by Dr. Eric Taylor will give your students an opportunity to learn about the many different trees along the Eastman nature trail.
11. Close the classroom lesson of "Bugs Don't Bug Me" by discussing with your students the following questions and by reading David Kirk *Miss Spider's Tea Party* or David Greenberg's *Bugs!*
 - Why are bugs an important part of the ecosystem?
 - Why is it important to study insects?
 - How does "recorded" data help us better understand our environment?
 - What are the characteristics of an insect?

In the Field

Bugs Don't Bug Me

1. Prior to leaving your school make sure you have the following items.
 - Discovery Books
 - Ziploc Baggies (1 gallon size)
 - Pencils (inexpensive mechanical pencils are excellent)
 - Compass
 - Thermometer
 - Trapper Insect Traps
 - Water
 - First Aid Kit
 - Sack Lunch or light snack
 - Camera
 - Backpack(s)
 - Hand Lens or loupe
 - Packages of artificial sweetener and regular sugar
2. Before getting on the trail, remind students their observations and data collected will be used back in the classroom to create charts and graphs of their observations.
3. Set your behavior expectations before leaving the parking lot. Explain how students are to behave along the trail and in small groups. State specifically what behaviors you want to see along the trail. Remind students the higher their voices are the less likely they will see wildlife along the trail.
4. Distribute Discovery Books to students and record weather data observations. Teachers a gallon size ziploc baggie make an excellent container for pencils and Discovery Books during lunch or at the end of the day.
5. Walk through the gate and follow the trail. Remember to go slow and listen to your student's observations along the trail.
6. If you have enough adult supervision, divide your class into two groups. Have each group go in opposite directions along the trail. This will help reduce the noise level and also give your students an opportunity to share their observations when the class comes together at the halfway point. This is a good opportunity reinforce the idea that scientists share data too.

Post Eastman Activities

Bugs Don't Bug Me

- Write the word "Entomology" on the overhead and create another concept map. Compare with the one the class constructed at the introduction of the Entomology study.
- Research the history of the Lady Beetle at <http://www.ext.colostate.edu/pubs/insect/05594.html>
- Write a narrative about their experiences at the Eastman Nature and Wildlife Habitat Center.
- Have your students create charts and graphs of the data they collected while at the Eastman Nature and Wildlife Habitat Center. Compare the Eastman data with the data collected at your school. Have your students draw conclusions about their observations.
- Invite an Entomologist to visit your classroom and discuss the importance of insects.
- Students create an "Entomology Report" based on their Discovery Book observations at the Eastman Nature and Wildlife Habitat Center.
- Create an Insect Zoo in your classroom.
- Create bar graphs at home or in the Computer Lab. Use the data collected in the field to compare and contrast your school's environmental observations with that of the Eastman Nature and Wildlife Habitat Center's.
- Using 1 liter plastic coke bottle, students compete to build a better insect trap.
- Student produced books about their observations.
- Build insect models out of clay.

Bug Report

Date: _____ Time: _____

Location: _____

Present Weather: _____
(Clear, Cloudy, Overcast or Raining)

Air Temperature: _____ Celsius Air Temperature: _____ Fahrenheit

Wind: _____
(Which direction is the wind coming from?)

Trap #1

Location of Trap _____ Type of bait used _____

Total number of insects collected _____ Number of different "orders" of insects _____

Number in each insect order _____

Trap #2

Location of Trap _____ Type of bait used _____

Total number of insects collected _____ Number of different "orders" of insects _____

Number in each insect order _____

Trap #3

Location of Trap _____ Type of bait used _____

Total number of insects collected _____ Number of different "orders" of insects _____

Number in each insect order _____

Trap #4

Location of Trap _____ Type of bait used _____

Total number of insects collected _____ Number of different "orders" of insects _____

Number in each insect order _____

Resources

Publications

Kirk, David. *Miss Spider's Tea Party*. Scholastic Inc., 1994.

Greenberg, David T., *Bugs*. Little, Brown and Company., 1997.

Field Guide for the Eastman Nature and Wildlife Habitat Center by Eric L. Taylor, Ph.D.

Carle, Eric. *The Honeybee and the Robber Fly: A Moving Picture Book*. New York: Putnam Publishing Group, 1981.

Dahl, Raold. *James and the Giant Peach*. Illustrated by Nancy Ekholm Burkert. New York: Puffin Books, 1961.

4-H Entomology Leader's Guide to Study of Insects. Contact your local extension office and 4-H agents.

Dunn, Gary A. *YES International Entomology Resource Guide: The Insect Study Sourcebook 4th Edition*. Lansing, MI: Young Entomologists' Society, 1992.

Web Pages

Acorn Naturalists

<http://www.acornnaturalists.com/store/>

Digital Dragonflies

<http://dragonflywebsite.com/gallery/digital.htm>

Entomological Society of America

<http://www.entsoc.org/>

Insects in the Classroom

http://iitc.tamu.edu/lesson_plans.html

Insects as Food

<http://www.ent.iastate.edu/Misc/insectsasfood.html>

The Butterfly WebSite

<http://butterflywebsite.com/>

Using Live Insects

<http://insected.arizona.edu/uli.htm>

Africanized Honey Bees

<http://ag.arizona.edu/pubs/insects/ahb/>

Creepy Crawly Zoo

<http://www.creepycrawlyzoo.com/>

Insect Lore

<http://www.insectlore.com/>

Insect Sounds

<http://www.naturesongs.com/insects.html>

Bug Identification

<http://www.insectidentification.org/insect-key.asp>