

What types of insects are living in our garden?

MY OWN FOOD CHAIN PROGRAM (K-2)

Integrated Pest Management

(ILS 11A, 11B, 12A, 12B)

Overview

This curriculum explores the relationship between people and the food they eat. It aims to give children in grades K-2 a basic understanding of the flow of energy through the food chain, and the place of people in the food chain. If teachers complete the entire curriculum, their classes will explore food chains in nature, focusing on its individual links and looking at the flow of energy as a whole. Students will then look at the place of people in the food chain, and discover how people have appropriated nature's systems in agricultural practices – making the food chain our own. Classes will compare traditional and sustainable agricultural practices.

Sustainable Agriculture, for the purpose of this curriculum, shall be defined as "a system of food production, supported by consumers, where farming operations, practices and technologies work in harmony with the natural systems that sustain life on earth."

Suggested Grade Level

This curriculum is designed for kindergarten through second grade levels. The topics covered can be built upon in complexity throughout that age range.

Approximate Time

About 45 minutes

Objectives

1. The students will create a bug trap and place it in their garden.
2. The students will discover what types of insects are living in their garden and try to find out if they are helpful or hurtful to the plants

Activity Abstract

In this lesson, students will follow instructions to build insect traps. They will place the traps in the garden and discover what insects live in their garden. They will learn what these insects eat, and whether they hurt or help the plants there.

Background Information

INSECT AND DISEASE CONTROL

From http://edis.ifas.ufl.edu/scripts/htmlgen.exe?DOCUMENT_VH019



During periods when infestations of various garden pests are high, control by natural means becomes very difficult. However, the following practices will help to reduce losses without use of chemical pesticides.

1. Plant resistant varieties.
2. Plant seed from disease-free plants.
3. Select pest-free transplants.
4. For cutworms, place a cardboard or tinfoil collar around plant stems at ground level.
5. Spade garden early so vegetation has time to rot before planting.
6. Use a mulch; vegetables touching the soil may rot.
7. Clean up crop refuse early.
8. Plant as early in the spring as practical.
9. Keep out weeds which harbor insects and diseases.
10. Summer fallowing (clean cultivation) helps control nematodes.
11. Summer flooding, where soil type permits, helps control nematodes.
12. Hand-pick insects.
13. Water in morning so plants are not wet at night.
14. Dispose of severely diseased plants before they contaminate others.
15. Some insects, like cabbage worms, may be killed by spraying with natural preparations such as *Bacillus thuringiensis*.
16. Rotate garden areas.
17. Bake transplanting soil in oven at 160°F for 1 hour.
18. *Crotalaria spectabilis* and marigolds, when planted as cover crops, tend to reduce some kinds of nematodes. The use of marigolds to *repel* nematodes from interplanted vegetables is not effective control.
19. A good garden mulch tends to reduce *damage* caused by nematodes.
20. Many organic gardeners approve of and use sprays and other preparations containing naturally occurring materials. Diatomaceous Earth comes from petrified sea life. Pyrethrin, rotenone, and ryania are examples of natural poisons from plant parts. These give some control to some insects under certain conditions.
21. Natural predators should be encouraged wherever possible; however, predators raised in captivity, then released into the garden area are usually ineffective.
22. Insecticidal soaps, made from fatty acids tend to work well for some insects under average conditions.
23. Insect traps, baited with pheromone lures, work well in some instances. Many of these have sticky adhesives to catch insects.
24. Solar fumigation is effective in reducing some soil-borne problems such as nematodes. Refer to "Nematology Plant Protection Pointers", such as NPPP-17, for details.

Materials

For each group of four students, you will need:

- Three bottle tops (about ¼-1/2 inch high).



- A 1-qt. pickle (or similar) jar, cleaned (no label).
- Cap from a plastic milk jug.
- Plastic disposable dinner plate
- ½ tsp. honey

For the class, you will need:

- double-sided tape
- pencils
- cardboard scraps
- bug boxes, or babyfood jars with lids, to keep insects in when traps are cleaned out.
- Insect field guides
- Internet or library access

Procedure (Session 1)

1. **Review prior knowledge.** Ask students to draw an insect and label its parts, based on the insect intro lesson.
2. Explain that today we are going to begin to find out what types of insects live in our garden. Have students predict: Will they be the same types that live in the wild spot where they used the insect nets? Why or why not? Will you find more or fewer insects?
3. **Hands on Experience.** Create insect catchers, having each group of four students make their own. Instructions and illustrations are in the appendix.
4. Place the catchers around the garden.

Subsequent sessions:

5. Check them each day for insects. Transfer the insects from the trap to the bug boxes (or jars) to take back to the class and study. Check for at least a week, preferably two.
6. Try to identify the insects using the field guides. **THIS MAY BE HARD!** Insects are the most numerous creatures on earth, and it's not unusual for professional entomologists to run into species they don't recognize!
7. **Introduce Scientific Principle.** When you identify an insect, look it up on the internet. Try to figure out what the insect eats and what eats it! (With younger kids, this may be a job for the teacher to do and then share with the students.)
8. Have students share information with the class.
9. If the insects are bad for plants, try to brainstorm ways to reduce their populations. For example, if birds eat the insect, have the class make birdhouses and place them by the garden to attract the insects' predators.
10. Unless the insect is damaging to the garden, release all the insects back into the wild.

Extensions (optional)

Try an experiment to see if you can catch different types of insects in your catchers. Instead of using honey as the bait in each trap, have the class brainstorm other things insects might eat – from plant leaves to candy! Put different things in each bug catcher and see what types of insects are attracted to what types of bait.



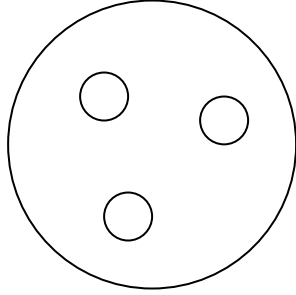
References

Pfiffner, G. (1996). Earth-friendly outdoor fun. (New York: John Wiley and Sons.)



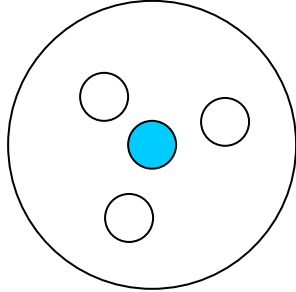
Appendix A. Bug catcher instructions.

1. Arrange the three bottle caps upside down on the plate in a triangle, so that they will hold up the jar when it's upside down.



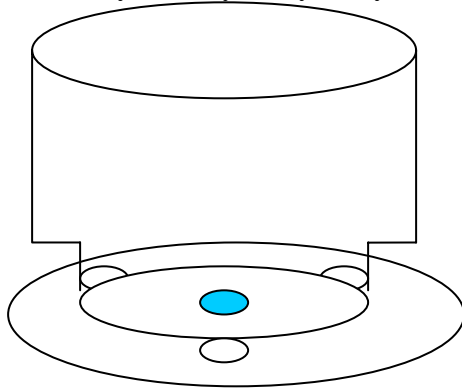
(view from the top)

2. Mark the positions of the caps with a pencil; use double-sided tape to affix them in the correct position.
3. Tape the milk top, upside-down so it forms a small bowl, in the middle of the plate.



(view from the top)

4. Fill the milk lid with honey.
5. When the jar is placed on top of the plate, insects will enter looking for the honey, eat, try to fly away, and be trapped by the jar, which they can't see.



(view from side)

