



Pest & Disease Control Department

Lesson 3 - Wanted and Unwanted Guests!

Essential Questions:

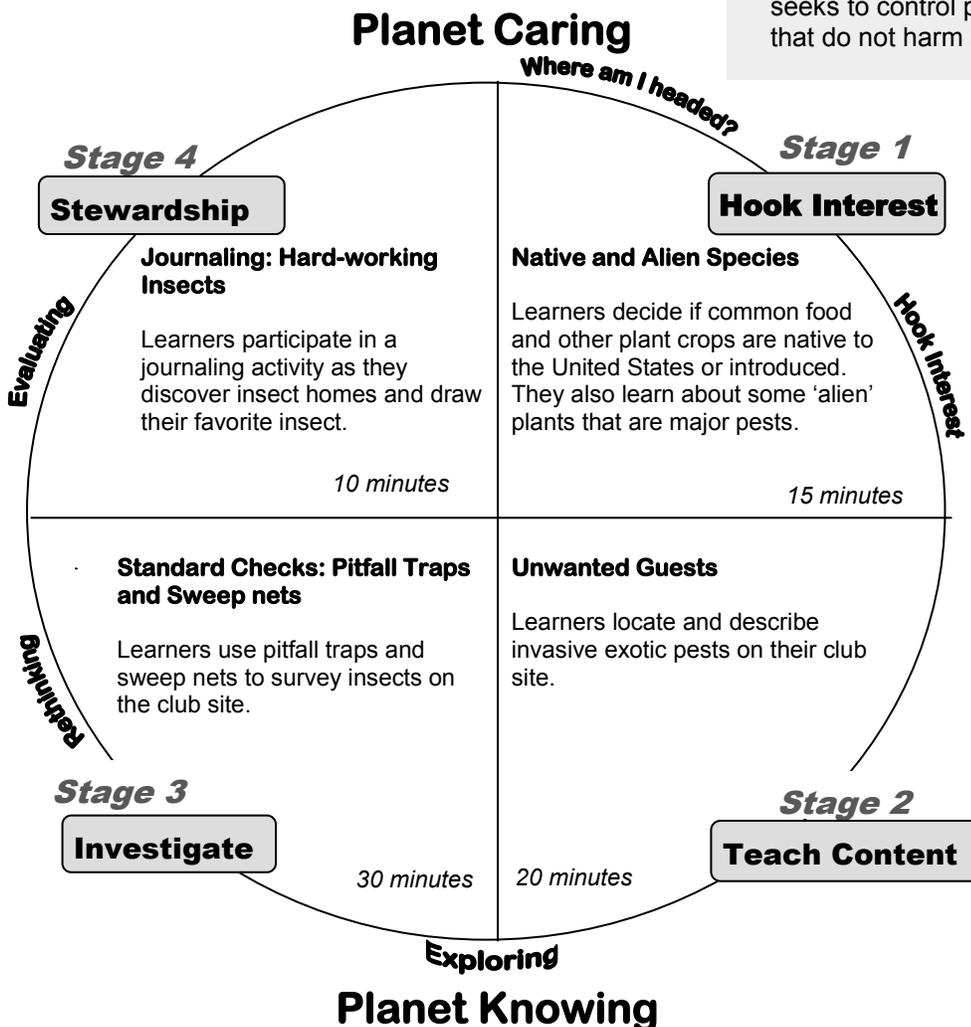
- What is the difference between introduced and invasive species?
- Are all introduced species bad?
- What are some invasive species on my club site?
- What type of insects are on my site and how can I survey them?

At a Glance:

Learners start the lesson with a list of plants. They are to decide if they are native or introduced. They then learn the difference between introduced and invasive plants and learn about some nasty 'alien' species. Learners continue their focus on invasive species by locating exotic pests on their site and designing a removal and restoration plan. Next, learners switch to crawling critters and survey insects using pitfall traps and sweep nets. The lesson is finished with a journal entry about insects and their homes.

Concepts:

- Populations of most organisms are kept in balance by interactions with other species. This is called biological control.
- In general, what animals eat determines whether humans classify them as helpful or harmful and determines their roles in ecosystems.
- Some insects and invertebrates are clearly harmful to human health, crops, and livestock and/or animals and need to be controlled.
- Most insects and invertebrates are beneficial, and all have roles in their ecosystems.
- Integrated pest management is an approach that seeks to control pest insects efficiently in ways that do not harm human health or the environment.



Objectives

Learners ...

- 1) define the terms native, introduced and invasive.
- 2) identify 3 native and 3 introduced plant species.
- 3) identify invasive plants on their club site.
- 4) design a plan for invasive plant removal.
- 5) experiment with pitfall traps to capture, ID and observe arthropods.
- 6) capture and observe insects with sweep nets.
- 7) classify organisms found during the activities as pests or beneficials.
- 8) compare different insect homes.

PROCEDURES IN BRIEF: Lesson 3—Wanted and Unwanted Guests!

Stage 1. Native and Alien Species

Procedure:

1. Introduce the terms Native and Introduced species. Complete the 'Are You Native or an Alien?' worksheet.
2. **Answers:**
 - **List 1: Peanuts**-S. America, **Pecans**-U.S., **Corn**-Central America and Mexico, **Wheat**-Middle East, **Oak trees**-U.S. (some species)
 - **List 2: Daffodils**- Mediterranean, **Tulips**- Mediterranean and Middle East, **Azaleas**-U.S. (some species), **Magnolias**-U.S. (some species), **Sunflowers**-U.S.
 - **List 3: Oranges**-S.E. Asia, **Blueberries and Raspberries**-U.S., **Peaches**-China, **Grapes**-U.S. (some species)
 - **List 4: Pumpkins, Squashes, Potatoes, Beans**-Mexico and South America, **Tomatoes**-South America
3. Allow time to complete the 'Dangerous Beings on the Loose!' worksheet or send it home with the learners to do with their parents.
4. Brainstorm bad effects of introduced species and how to help protect biodiversity. Is introducing a plant or animal ever okay? (Yes – not every introduced species is invasive; biological control of an invasive introduced species).

Supplies

- chalkboard or large piece of paper
- 'Are You a Native or an Alien?' worksheet
- 'Dangerous Beings on the Loose!' worksheet

Stage 2. Unwanted Guests

Procedure:

1. For this activity choose a loop to walk on your school site and walk the same way each time you do this standards' check.
2. Using the diagrams provided or a field guide, survey the club site for invasive plants.
3. Record information in the table on the Standards Checks Data Sheet.
4. Determine course of action to save your club site from the aliens!
5. Depending on the species of plant, you may be able to pull it out by hand or you may need a shovel or trowel. If you have gloves, wear them to protect your hands. You may want to gather all information and then plan to pull the plants on at another club meeting.
6. After digging or pulling the plant, put in a place where it can be composted. A pile separate from compost that you are planning to use for amending soil. Watch out for seeds! If the plants has ripe seeds, they can spread.
7. Pulling a plant can create an excellent opportunity for planting another one! The soil will be loosened and the hole practically dug. Your club may have plants growing in a grow lab or plans for a service learning project to beautify your club site. If planting is a possibility, consider plants that will provide food sources and good habitat for pollinators, birds and other creatures that make up you club site ecosystem.

Supplies

- SC Data Sheet
- SC Map
- Clipboard
- Pencil
- Invasive plant identification
- Shovel/trowel
- Gloves
- flagging

Stage 3. Pitfall Traps and Sweep nets

Procedure: *In depth activities-Please see full write-up.*

Pitfall Traps

1. Choose several places to sample insects and other arthropods. Note their locations on the Standard Check (SC) map and data sheet.
2. Place the pitfall traps in the ground according to the instructions in the full activity write-up.
3. Explain that insects that crawl across the trap will slide through the hole in the funnel into the cup below. The funnel will keep flying or jumping insects from getting out.
4. Mark the location of the pitfall trap with a flag.
5. Leave the cups in place for approximately 24 hours.
6. On the following day, help learners carefully remove the inner cup without allowing insects to escape. Empty the cup into the vial or insect box.
7. Identify the insect using a field guide. Learners should record the insects and other arthropods that are found on their worksheets.

Supplies

- pitfall traps
- bulb planter or a trowel
- flags
- vials or insect boxes
- Data Collection worksheets
- an insect field guide
- sweep nets
- pens/pencils
- magnifying lenses
- compass

Sweep Nets

1. Distribute the data sheet and explain how to survey using a sweep net.
2. Divide learners into three teams and send each team to a Checkpoint.
3. Allow each student to make five sweeps with the net at 2 paces N and 2 paces S of the Checkpoint. Brush the net on the vegetation while sweeping. Remove the contents of the net and place the insects in a vial or insect box for further observation.
4. Each student should record the number and types of insects or other arthropods in his or her net. Learners can use a field guide to identify the insects and arthropods that they caught.

Stage 4. Hardworking Insects *Journaling*

Procedure:

1. Discuss insects as beneficial members of ecosystems, even though we see some as pests.
2. Ask learners to name a few insect homes and what they look like. Why do insects have different types of homes (some in the ground, some in trees)?
3. Give a brief overview of the 'Hard Working Insects' journal entry. Tell learners to use caution when looking at insect homes. Be careful not to disturb the insects as well as to avoid bites or stings.
4. Learners will need to walk around and explore the area before starting their journal writing. Provide learners with magnifying glasses, if available.
5. Allow learners to find a quiet place outside with their journals and/or 'Hard Working Insects' worksheet. To start, have learners record the date, time, and surroundings of their journal entry.
6. Give learners time to read through and complete the journaling activity (15-20 minutes).
7. Gather learners back together and allow those who want to share to read or discuss their journal entries.

Supplies

- Journal or 'Hard Working Insects' worksheet
- Pencil or pen
- Magnifying glass (optional)