



Pests in the Garden

Aim

Students will understand how pesticide use adversely affects other living things within the garden community.

Summary

Students play a game to demonstrate how pesticides affect other animals in the food chain, then do a garden job to control pests without the use of pesticides.

Standards

CCSS: ELA, Grade 3, SL4: Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

NYS: Science, LE 7.1c: Humans, as individuals or communities, change environments in ways that can be either helpful or harmful for themselves and other organisms.

Materials

- Dry erase board and markers
- Have You Seen These Garden Pests? worksheet
- Visuals of pesticide use
- Example of in-home pesticide (i.e. Raid)
- “Food” necklaces, some with blue lanyards and some with green lanyards
- Materials for making garlic spray, or for another garden job (optional)
- Seasonal tasting

Vocabulary

- pest
- pesticide
- poison
- food chain/food web

Procedure: Day One**Opening Circle** (5 minutes)

- *Today we're talking about bugs in our garden. What are some of the jobs that bugs do in our garden? Have students give a few examples, such as worms making compost or bees pollinating flowers.*
- *You're right that all bugs have different jobs that they do in the garden. Sometimes, there are bugs in our garden that eat our fruits and vegetables. The word that farmers or gardeners use for these bugs or animals is "pests." It's not their fault, because they need to eat, too, but that's what they do! Today, we're going to learn about these bugs and the best ways to deal with them in our garden.*

Inquiry Activity One (10 minutes)

- *Pass out visuals of different garden pests. Ask students if they recognize any of these garden pests. What would happen if our garden was full of these pests? What would happen to our fruits and vegetables? They would eat them all up!*
- *Farmers and gardeners have different strategies for dealing with these bugs on their farms or gardens. One way is by spraying a chemical poison called a "pesticide." Write the word "pesticide" on the board. Can anyone take a guess what a pesticide does? A pesticide is a kind of poison that makes the bug die. Sometimes, the pesticide kills the bug just by being sprayed on them. Sometimes, the pesticide gets absorbed by the plant, and then once the bug eats the plant, then the bug dies.*
- *Show an example of a pesticide meant for in-home use. Sometimes, people use pesticides like these inside their homes to kill bugs or insects that they don't want in their houses. But farmers don't use a spray bottle like this.*
- *Tell students that you are going to pass out some visuals of farmers using pesticides. Write prompting questions on the board:*
 - *In the picture, are the farmers using a little bit of pesticides, or a lot of pesticides?*
 - *Do you think the farmer is just killing the pest bugs, or other bugs, too?*
 - *What would happen if the farmer accidentally killed other bugs, like worms or bees?*
- *Discuss the visuals as a whole group. Farmers who use pesticides may not be trying to hurt other bugs, but they can end up killing all the bugs on their farm! Why is it a problem if all the bugs on their farm get killed?*
- *If time allows, discuss the visual with the farm workers spraying pesticides. Do you think it would be safe for the farmer to have the pesticide chemicals on their skin, or to breathe them in? Using pesticides might not be good for the farmer or workers either.*
- *I think you guys understand that pesticides can end up hurting lots of bugs and insects on the farm or in the garden. But we're going to play a game to see how the use of pesticides affects other animals, too.*

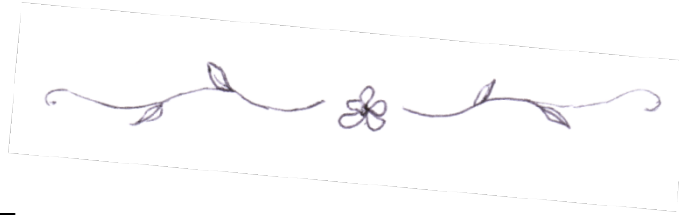
Inquiry Activity Two (25 minutes)

- *Remind me, what is a food chain? Can you give me an example of a food chain? In our game, our food chain is going to consist of caterpillars, sparrows, and hawks. Some caterpillars can be a pest that eats the leaves of plants in the garden. Write the sequence of the food chain on the board.*
- Assign half of the class to be caterpillars. Explain that they are going to go out in the garden and find some food. For each of them in the garden, there is a necklace with the word “food” written on it. Once they find the necklace with the food on it, they should stay in their spot and wiggle their bodies to show that they have eaten some food. (Be sure you have hidden all the necklaces fairly close by, so you can keep an eye on all students.)
- Assign a smaller portion of students to be sparrows, about half as many students as were sparrows. Tell the sparrows that they are bigger animals, and pretty hungry, so they have to go out and find their food. But their food is the caterpillars! Tell them to go out and find two caterpillars to eat. In order to “eat” the caterpillars, they should take their necklaces. Once they have eaten two caterpillars, they should stay in their spot and chirp like birds to show that they have eaten their food.
- Assign the remaining students to be hawks. They eat the sparrows. They are also pretty hungry, so they should find at least two sparrows to eat. In order to eat the sparrows, they should take the necklaces from two sparrows. Once they have taken the necklaces from two sparrows, they should stay in their spot and flap their wings to show they have eaten their food.
- Call the whole group back to the circle. If any caterpillars or sparrows are still wearing necklaces, you can take them back.
- *Okay, hawks. Each of you is wearing four food necklaces. Remind me why? You ate the sparrows, and the sparrows ate the caterpillars, which ate the food in the garden.*
- *Unfortunately, hawks, not all of the food that you ate is the same. Some of the food that was in the garden at the beginning of our game was poisoned with pesticides. If your food is on a blue lanyard, you’re safe. But if you’re wearing one with a green lanyard, that means you ate poisonous pesticides! And if you have two green lanyards, the poisonous pesticides have killed you!*
- *But wait! The hawk doesn’t eat plants! How did the pesticides get into the hawks’ bodies?* Solicit from students that, because the caterpillars ate the pesticides, the pesticides traveled into the sparrows and ultimately into the hawks.
- *Oh no! The poisonous pesticides got into the hawks, too? I didn’t mean to make the hawks sick when I sprayed the pesticides on my farm!*

Closing Circle (5 minutes)

- *If a farmer or gardener sprays pesticides, does it just hurt the pests? What other animals can it hurt? How?*

- *In our garden, we don't use poisonous pesticides. Why not? Why do you think we don't do that?*
- *The next time we're together, we're going to talk about ways that we deal with pests in our garden.*



Procedure: Day Two

Opening Circle (5 minutes)

- *What did we talk about the last time we were together? What are pesticides? What do they do? Why do farmers use them? Do pesticides just hurt the pests?*
- *Of course, it's the job of the farmer to be sure that the fruits and vegetables don't all get eaten! But all around the world, there are farmers who have pledged to not use pesticides for all the reasons that we talked about. Today, we're going to practice some of the ways that farmers and gardeners can protect their plants from pests in the least harmful way.*

Garden Job (30 minutes)

- Lead students in a garden job that contributes to pest control.
- One option is to have students use a garlic spray to deter pests. Discuss with students how the garlic spray acts to keep pests away. Let students smell it to see how potent it is! Assign students to work in small groups, carefully spraying the leaves and stems of established plants, being careful to not spray one another.
- (Note: The garlic spray needs to be made ahead of time. Mince three of four cloves of garlic, and mix into two teaspoons of mineral oil. Let the mixture sit overnight, and then strain the garlic out. Add the oil to one pint of water, and add a teaspoon of biodegradable dish soap.)
- Other options include planting habitat for predatory insects or animals, or covering crops with row cover. In either instance, explain how the method being used protects fruit and vegetable crops.
- If you have chickens in your garden, discuss how pests can become food for chickens. If you have pests that can be picked off, like cabbage moths, students can pick them off and collect them to be fed to chickens.

Closing Circle (10 minutes)

- Have students share out about their work.
- Share a seasonal tasting.
- *Thanks for being careful gardeners today, everyone. We can keep our plants protected from bugs without having to use poisonous pesticides!*

Common Core State Standard Extensions

ELA, Grade 3, W1: Write opinion pieces on topics or texts, supporting a point of view with reasons.

- Have students write about pesticides from the perspective of a beneficial garden animal, such as a worm, bird, or butterfly. Students should try to convince the reader how and why pesticide use can have unintended consequences in the garden.

Other Extensions

Science: Have students draw a garden food web to the best of their ability, including and labeling the producers, primary consumers, and secondary consumers. Have students use this visual to accompany a persuasive text or presentation that shows the widespread effects of pesticide use on an ecosystem.



You found
food!



You found
food!



Have You Seen These Garden Pests?



Snails are slow, crawling creatures that like to eat tender baby plants.



Beetle grubs live underground and eat the roots of garden plants.



Aphids are tiny bugs that like to suck the sap out of plant stems.



Grasshoppers are jumping insects that chew holes in plant leaves.



Cabbage moth caterpillars especially like to eat broccoli, cauliflower, and, of course, cabbage.



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