

***Dedicated  
to Reducing  
Pesticides***

## Unit 2 Lesson 3: CAUTION: Chemicals

**Focus Areas:** IPM, Science

**Focus Skills:** understanding cause and effect, conducting an experiment, observing, drawing conclusions

### Objectives

- To recognize that chemicals can spread through soil and water
- To understand that chemicals can endanger plants and animals
- To realize that the use of chemicals to control pests is not a wise FIRST choice

### Essential Questions

- What happens to the chemicals we use to control pests in our lawns and gardens?
- Why should we try to control pests using other IPM methods before using chemicals?

### Essential Understanding

Chemicals, whether liquid or powder, used to control outdoor pests are easily moved by wind and water to places we never wanted them to go!

### Background

Chemicals are considered by many to be the most effective form of pest control. However, they pose a potential danger to every part of the Earth's environment. The very ingredients that make various chemical products devastating to targeted pests are often highly toxic to non-targeted plants and animals as well. Powders and sprays don't stay in a precise location when applied. Wind drift disperses the toxins to the surrounding area. When mixed with water, chemicals can seep into groundwater, affecting rivers, streams, and wells. Evaporation of these same products pollutes the air and contributes to the formation of acid rain.

Chemical controls are a part of IPM, but because of the potential dangers involved in their use, chemicals should never be the first line of defense in the war on pests.



**University of  
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College of Agriculture  
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### Vocabulary



<b>chemical control</b>	a product containing toxic ingredients used to control pests
<b>dilute</b>	to make something weaker by mixing it with other materials
<b>herbicide</b>	a chemical used to control weeds
<b>hypothesize</b>	to make a guess based on what you have observed
<b>insecticide</b>	a chemical used to kill insect pests
<b>pesticide</b>	a chemical used to control pests
<b>pollution</b>	something that damages the natural environment
<b>seep</b>	to slowly leak through from one place to another
<b>toxic</b>	something that hurts plants, animals, and our environment

### Logistics

**Time:** two 20-minute sessions, plus 2 to 3 minutes per day to observe plants

**Group Size:** 2 to 25

**Space:** a classroom

### Materials



paper cups (2 per individual or team)  
white plastic plates  
soil (enough to fill paper cups 1/2 full)  
red food coloring in a clear container  
blue food coloring in a clear container  
3 liters of water  
measuring cup  
celery stalks  
white carnations  
eyedropper  
Izzy puppet \*  
(\* single copy provided)



## Unit 2 Lesson 3: CAUTION: Chemicals

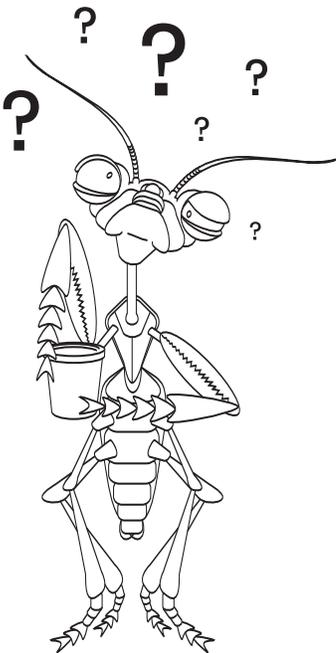
### Preparation

1. Put three holes in the bottom of each cup.
2. Fill enough cups (for teams or individuals) 1/2 full with soil.
3. Put each cup on a plastic plate.
4. Fill remaining cups with water (1/2 full).
5. Prepare containers with food coloring and clear water.
6. Purchase celery stalks with leaves.
7. Place celery stalks in cups 1/2 filled with clear water.
8. Obtain carnations (1 per team of 3 or 4).

### Activity

#### Introduction

1. Izzy calls the children's attention to the celery stalks in the water-filled cups and asks why the celery is in water. (Plants need water to live.)
2. Izzy shows the children the container of red food coloring and tells the children that the colored liquid is a pretend **chemical control** for pests that adults use to get rid of pests in their yards and gardens.
3. Izzy asks why adults use chemicals in their yards and gardens to get rid of pests. (Chemicals work well to kill pests.)
4. Izzy tells the children that the celery represents a weed pest and invites them to put some pretend weed killer in their cup.
5. The children add a drop of food coloring to their cup and set the cup aside.





## Unit 2 Lesson 3: CAUTION: Chemicals

### Involvement

1. The children observe what happens to the celery stalk over the next few days. (The colored water will be taken up by the celery stalk and show in the leaves.)
2. Izzy discusses with the group what will happen to these poisoned weeds. (They will die.)
3. Add more water, a new celery stalk, and a carnation to each cup.
  - a. Izzy explains that the carnations are not weeds, but rather plants that are wanted in the yard or garden.
  - b. Izzy explains that adding extra water **diluted** (weakened) the **toxic herbicide** and asks the children to **hypothesize** what will happen to the carnation.
4. The children observe the celery and carnations over the next few days. (The carnation as well as the celery will show signs of absorbing the food coloring.)
5. Izzy asks the children what might happen if bunnies or deer ate these plants. (They might get sick, too!)
6. Izzy discusses why adults might not want the herbicides to be absorbed by their flowers and vegetables. (The poison will make these plants sick, and if people eat them without washing them well first, they could get sick too!)
7. Izzy asks the children why using chemicals to kill animal and plant pests in their yards and gardens might not be the wisest choice. (Chemicals that kill pests can also hurt plants and animals that are wanted in the yard or garden.)

### Follow Up

1. Izzy asks the children if lawns and gardens are planted in just water. (no)
  - a. Izzy asks a volunteer to explain how lawns and gardens are **REALLY** planted. (in dirt and then watered)
  - b. Izzy polls the group to determine if they think the soil (dirt) will protect the plants from absorbing (drinking) the chemicals. Record the results of this poll.



## Unit 2 Lesson 3: CAUTION: Chemicals

### Follow Up (continued)

2. Distribute to teams the plastic cups, filled with soil and with holes in the bottom.
3. Display the chemical (food coloring) and add it to the dirt in each cup. (or to individuals)
4. Have the children place their cups on a plastic plate.
5. Have the children water their soil.
6. Check the cups and plates at the end of the day. (The water in the plates should be tinted with the **chemical control**.)
7. Izzy explains that the water that seeped through the soil is now **polluted** and will mix with rain, underground water, and streams! It will **dilute**, but it won't go away.
8. Izzy helps the children form a generalization about the dangers of using chemical controls to stop pests. (Chemicals that destroy pests can also harm plants and animals that aren't pests!)



## Unit 2 Lesson 3: CAUTION: Chemicals

### Notes



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