# Unit 5 Section 3 Lesson 1: Danger, Destruction Zone

**Focus Areas:** Pest Control: Chemical; Science
**Focus Skills:** observing, experimenting, understanding cause and effect

## Objectives

- To recognize the value of wetland ecosystems
- To understand the negative effect chemicals cause to wetland ecosystems

## Essential Questions

- How are wetlands threatened?
- Why are wetlands important to preserve?

## Essential Understandings

- Wetlands in the United States are adversely affected by an increasing human population.
- Invasive species, such as purple loosestrife, dry out wetlands by reducing the water supply and crowding out other plants.
- Wetlands act as a sponge for pesticides that run off from higher ground. The pollution may cause creatures, such as frogs, to be deformed.

## Background

A wetland is a special type of habitat for certain plants and animals. The organism's environment includes everything that surrounds it – the air, water, soil, and other plants and animals that live there. An organism's habitat is that part of the total environment that it uses to find all the things it needs to survive. Each organism has unique ways of obtaining the resources it requires from the habitat to meet its needs. It has a special niche, a specific place where it interacts with the environment in order to survive. There can be niches for many different organisms in a certain habitat.

IZZY PRAYING MANTIS
*Dedicated to Reducing Pesticides*
IPM INTEGRATED PEST MANAGEMENT
University of Connecticut
College of Agriculture and Natural Resources
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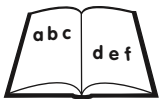
# Unit 5 Section 3 Lesson 1: Danger, Destruction Zone

Wetlands throughout the United States are threatened by humans and farming. People build houses near them and drain the water. Without water, the plants die and the animals that live in the marshes and swamps die without the plants to eat. Farmers spray pesticides that leach into the soil and contaminate the ground water we use. Wetlands help to filter out pesticides and other pollutants before the water reaches streams and rivers. Wetlands are the earth's breeding nurseries for insects and amphibians. These poisons may cause birth defects in animals, such as frogs. An additional threat is invasive species, such as purple loosestrife, that invade the wetland, choke out other plants, and break the food chain.




## Vocabulary

| | |
|---|---|
| **food chain** | the pattern of one organism eating another to survive (predator and prey) |
| **marsh** | an area of soft, wet, low-lying land, characterized by grassy vegetation |
| **pesticide** | a chemical used to kill pests |
| **pollution** | material (liquid, gas, or solid) that contaminates and damages the natural environment |
| **swamp** | a seasonally flooded bottomland with more woody plants than a marsh and better drainage than a bog |
| **wetland** | a lowland area, such as a marsh or swamp that is saturated with moisture |


## Logistics

**Time:** 45 minutes
**Group size:** 4 to 30
**Space:** a classroom

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## Materials

Wetland Plants and Animals Picture Card Set *
experiment: Polluting Wetlands
measuring cup (250 ml)
tap water
1 gallon (4 liter) glass jar
red food coloring
spoon
paper food chain
Izzy puppet *

* single copy provided

## Preparation


1. Prepare links for paper food chain demonstration.
2. Get picture cards from the kit.
3. Assemble **Polluting Wetlands** experiment materials.

## Activity

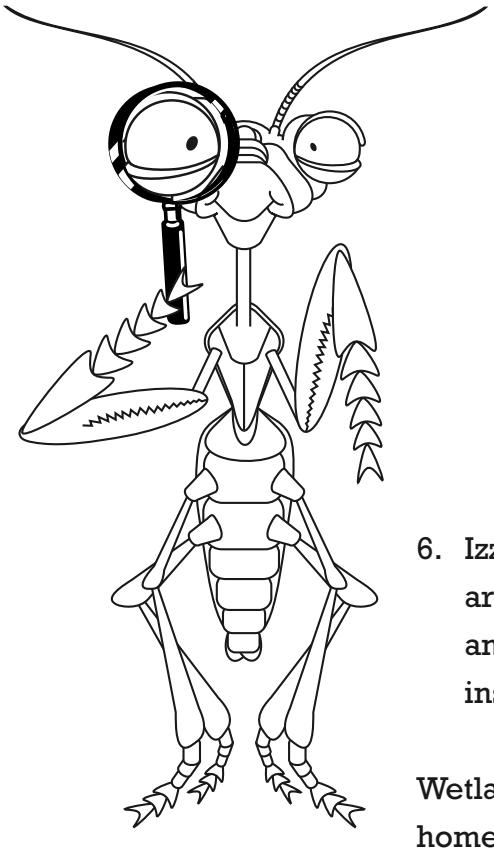
### Introduction

1. Write the word **WETLAND** on the board.
2. Izzy asks,

    a. "What two words do you see in this word?"
    b. "What do you think a wetland is?" (a low area covered by shallow water for at least part of the year)
    c. "Can anyone give me an example of a wetland?" (swamp, marsh)

3. Hang up the picture of a wetland.
4. Izzy tells the group, "Not only plants live in a wetland."

5. Show picture cards as children identify the following organisms:



Turtles
Frogs
Salamanders
Otters
Dragonflies
Birds: Herons and Ducks
Pitcher Plant: Insect-eating plant that traps insects in its pitcher-like stem
Fish
Mosquitoes

6. Izzy says, "Wetlands are beautiful and important habitats. They are home for hundreds of kinds of plants and animals that feed and raise their young there. Wetlands are nurseries for fish, insects, and frogs that begin their life in the shallow water."

Wetlands are in trouble. People drain them and fill them in to build homes. Invading plants, such as purple loosestrife, move in and choke out the native plants, the plants that grow there. One of the biggest problems is **pesticides**, the poisons that farmers use on their fields to kill insect pests and homeowners use to kill weeds. These chemical poisons get washed off the plants by the rain and soak into the soil. In addition, fertilizers from lawns, gardens, and farmer fields also pollute wetlands. Once in the soil, they seep down through the layers and **pollute** underground streams that provide us with drinking water. Even a small amount of **pesticides** can have a **big** effect.

We need to protect the wetlands because the wetlands protect us. They filter the pollutants that might eventually get into our streams, lakes, and ponds and maybe even our drinking water.

## Involvement

**Experiment: Polluting Wetlands** (do as a demonstration or in pairs)

**Purpose:** To observe the effect a small amount of pesticide has on a stream and its wildlife

**Procedure:**

1. Pour ½ cup of water into a jar.
2. a. Add and stir in two drops of food coloring.
   b. Izzy says, "We can see the pollution, but watch what happens as we add more water."
3. a. Add 1 cup of water at a time to the jar until the red color disappears. (about 7 cups)
   b. Izzy says, "This is what happens with some water pollutants - pesticides that find their way into streams and lakes. At first, when they get dumped, we can see them, but as they flow downstream and get mixed in with more and more water they become weaker and invisible. This doesn't mean they are gone. Just like the red food coloring, the pesticides are still in the water. Animals and plants in the wetlands are affected by pollution that happens many miles away."
4. Izzy says, "Wetland plants and animals depend on each other to survive."
5. Izzy asks:
   a. "What do living things need to survive?" [food, protection (clothing, shelter), air, light (usually), and room to grow]
   b. "Do all plants and animals need the exact same things?" (No)
6. Izzy asks, "Why do plants need sunlight?" (They use sunlight to make food to help them grow.)
7. Choose children to come up to the front of the room to become part of a food chain.

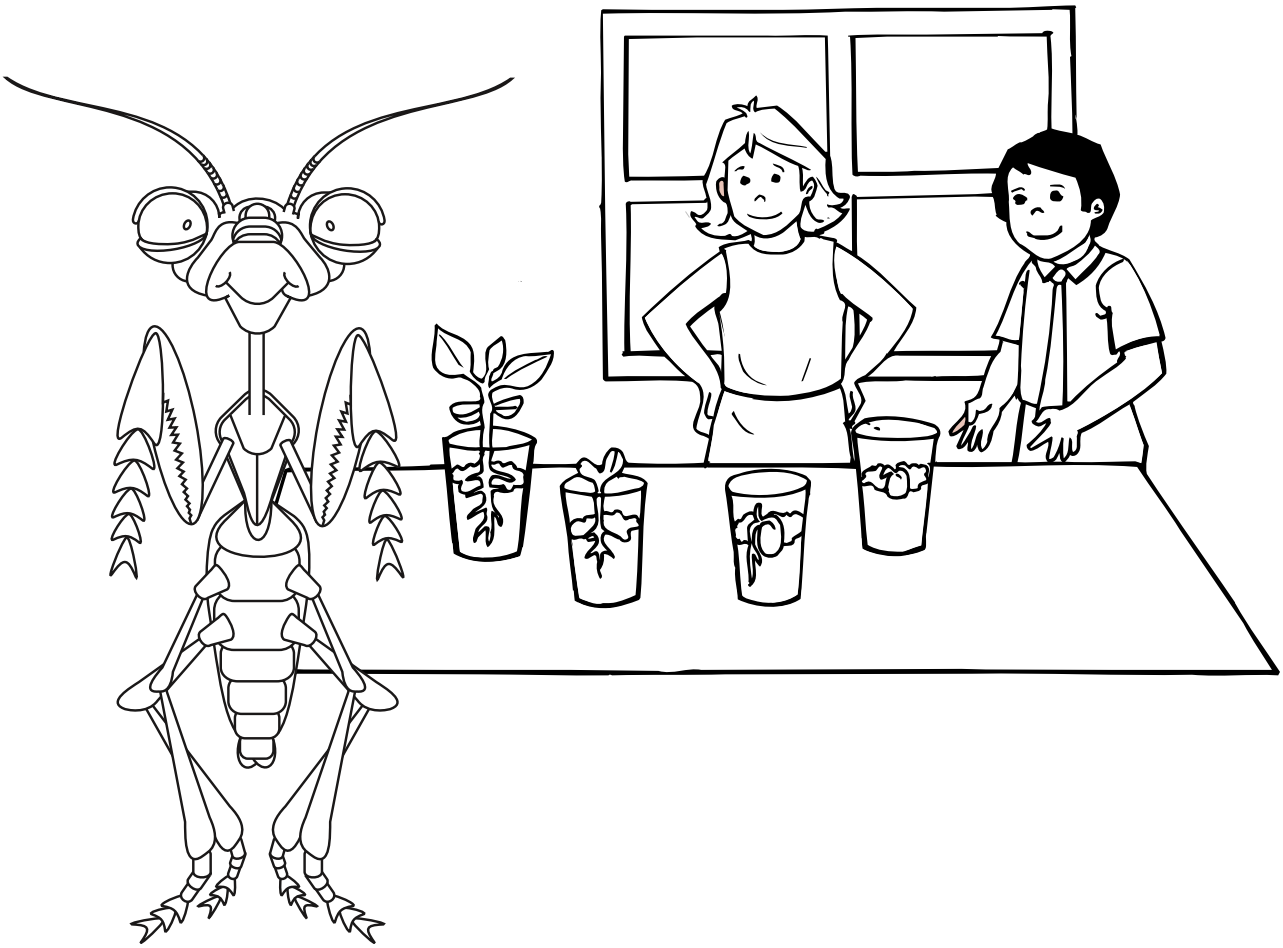
a. Call on a child to be a green plant, the first link in the food chain.
    1. Give him/her a paper link.
    2. Izzy sings (to the tune of *Farmer in the Dell*) with the children, "Green plants produce their food (repeat), Hi Ho the Derry-O, green plants produce their food."
b. Choose an insect to gather the nectar from the plant.
    1. Give him/her a link and tell him/her to join it to the plant.
    2. Izzy sings with the children, "An insect gathers nectar (repeat), Hi Ho the Derry-O, an insect gathers nectar."
c. Choose a child to be a frog.
    1. Give the frog a paper link to connect to the insect.
    2. Izzy sings with the children, "The frog eats the insect (repeat), Hi Ho the Derry-O, the frog eats the insect."
d. Choose a snake to eat the frog.
    1. Give him/her a paper link and tell them to join it to the frog.
    2. Izzy sings with the children, "The snake eats the frog (repeat), Hi Ho the Derry-O, the snake eats the frog."
e. Choose a bird to eat the snake.
    1. Give him/her a paper link and tell them to join it to the snake.
    2. Izzy sings with the children, "The bird eats the snake (repeat), Hi Ho the Derry-O, the bird eats the snake."

8. Izzy explains to the children that as each creature eats the other, they get energy to live and asks:
    a. "What is this called?" (a **food chain**)
    b. "What would happen if the plants died from the pollution in the water?" (All the insects would have to find a new home with food or they would die.)
    c. "What would happen if all the frogs were born with only two legs instead of four legs because of poison in the eggs?" (They couldn't hop to catch the insects so the insects would multiply and cause a problem.)

9. Izzy asks the children why pesticides that get mixed in streams, rivers, and lakes may be dangerous. (They can poison animals in the food chain.)

## Follow Up

Distribute art materials and have the children illustrate a flow chart of a wetland food chain.



## Notes