

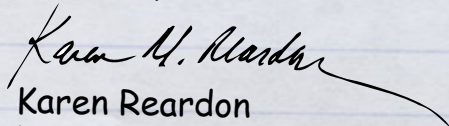
Dear Educators,

Thank you for taking the time to teach your students about the pests living in their world. We hope the lesson plan serves as a valuable tool in your classroom and encourages your students to explore their world and the different kinds of pests that surround them.

These lessons are designed to introduce students to the influence pests, particularly weeds and invasive plants, have on their environment. At the same time, students will use classification and observation skills while embarking on a fun investigation. With the knowledge they gain, they can build understanding about the different kinds of pests, both helpful and harmful, and even help their parents identify potential problems around their own homes.

We look forward to hearing back from you on how the lessons went and would welcome any feedback that you may have to share with us. A feedback form is included in the lesson plan packet to help you let us know how the lessons worked in your classroom.

Thanks and enjoy the investigation!
Sincerely,



Karen Reardon
Director of Communications
RISE (Responsible Industry for a Sound Environment)

P.S. If you are interested in also teaching your students about insect and rodent pests, download or request a copy of our accompanying lesson plan "Creepy Crawly Neighbors." The plan and the complementary book "What's Bugging You?" are available at www.debugthemyths.com.



How "Backyard Invaders" Was Developed

"Backyard Invaders" was designed and tested by Shannon C'de Baca, a high school science teacher with depths of lesson plan development experience.

In addition to her 30-plus years of teaching, Shannon is also the host of the Annenberg Public Broadcasting System television series, "The Missing Link in Mathematics." Shannon has written lessons for the PBS science series "NOVA" and has served as a consultant for the National Education and the Economy, PBS, the Council of Chief State School Officers, the National Education Association, the National Science Teachers Association (NSTA) and the U.S. Department of State. Shannon was one of two Citizen Ambassadors to Bahrain.

Known for using her classroom as a living laboratory to implement innovations and research-based strategies, Shannon has received awards from the Milken Family Foundation, Sertoma International, the Iowa Department of Education and NSTA for her work in the classroom.

Shannon is a member of The Teacher Training Corps of the Teacher-to-Teacher Initiative, which was created by and for America's teachers in 2004. The Initiative supports teachers' efforts in the classroom through professional development workshops, digital workshops and podcasts. The corps consists of teachers and practitioners who have demonstrated effectiveness in scientifically based instruction in their classrooms and districts.



Shannon C'de Baca,
lesson plan developer

The classroom activities will include the following:

Step 1: Engaging the Students

The teacher starts the lesson with a discussion in which he/she asks the students to describe weeds they have seen and where they have seen them. The main concept in this step is encouraging students to describe the weeds. As the students describe, the teacher should record these observations on the board.

Step 2: Formative Pre-Assessment

The teacher has the students write on a sheet of paper, or in their science journal, simple facts they know about weeds. He or she may begin this pre-assessment writing by asking the students to write a definition for the word "weed." The purpose of this writing is to see how much the students know about weeds and what misconceptions they hold in regards to the parts of plants. Using a set of cut-out cards that are separate drawings of roots, stems, and leaves (enclosed or available for download), the students will organize the cards into sets and explain the rule they used to organize the cards.

Step 3: Refining Observations

- A. The teacher holds up photos of weeds and asks the students to give good describing words for these plants. New words should be placed on the classroom word wall or written on the board.
- B. Students brainstorm where plants and weeds can be found around their school. The important part of this activity is for the students to identify which plants are considered weeds and why.



Step 4: Read Aloud

The teacher reads "What's Bugging You?" aloud to the students. This will give the students an opportunity to tell their own stories about how they or their parents have dealt with weeds around their home. Students can continue to build their word wall (in the classroom or online) as they hear the stories from their peers.

Step 5: Sock Walk

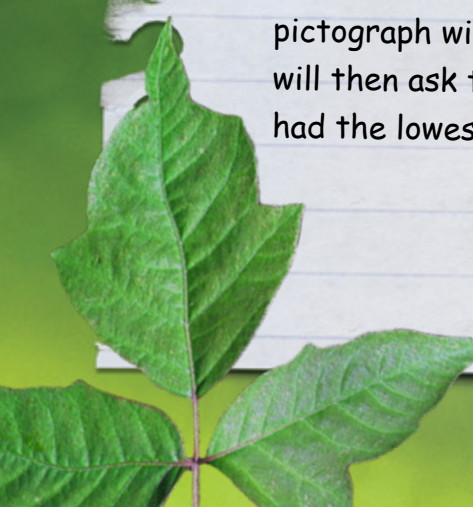
The teacher instructs the students to bring an old pair of socks to class. The students will pull these socks on over their shoes and walk outside. The students will walk around the school grounds, the parking lot, and the playground. Once they go inside, students will take off these extra socks, place them on a piece of newspaper, and pull any of the seeds that they picked up. They will then place the seeds on their desks to be sorted and counted. (Teachers will need to identify any students that have allergies to plants and will have to prevent those students from touching the seeds.) If there are no sites available where the socks will pick up seeds, there are several sites listed below where seeds are available to classes.

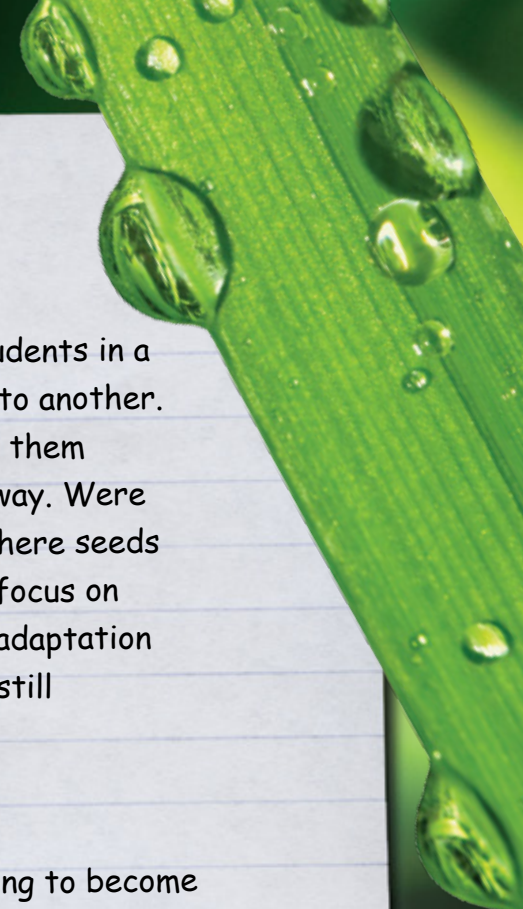
Rainy Day Alternative

(or alternative for kids with severe allergies):

The teacher places a large assortment of seeds they have gathered in advance of the lesson in a large box. Students will place socks on their hands and move their hands around the box so that some of the seeds attach to the socks.

The teacher directs the students to sort and count the seeds and make a pictograph with the type of seeds and amount of each seed. The teacher will then ask the students which seeds had the highest number. Which had the lowest? Do the students think most of their seeds are weeds?






In the last step of this activity the teacher leads students in a discussion about how seeds can travel from one area to another. As the students generate ideas the teacher will have them look for seeds in the activity that might travel that way. Were there any seeds that stuck tight to the socks? Are there seeds that might be carried by the wind? Teachers should focus on generating student understanding of the concept of adaptation and that plants that don't belong at their school can still live there.

Step 6: Weed Detective

The teacher tells the students that they are now going to become weed detectives. The teacher holds up cards with the three main parts of a plant labeled (root, stem, and leaves). The students will repeat the parts when the teacher points to each part in the photo. Each student will be given a sheet with these three parts and a space for writing or drawing (enclosed or available for download). The teacher will lead the class outside again and each student will select a secret plant in the schoolyard to study. They will sit beside their plant and describe in words and drawings each part, except the roots, as they may not be visible. Students will then trade sheets with another student who will look around the schoolyard and try to identify the plant from the word description and drawings.

The teacher then directs the students to look through "What's



Bugging You?" to find the most unwanted weeds and see if any of their schoolyard weeds fit that description.

Step 7: Dangerous Weeds

To continue the students' understanding of dangerous weeds, the teacher gives each student three cards (enclosed or available for download), each with a photo of poison oak, poison ivy, or ragweed. The teacher will guide the students to develop a description of these plants and explain why they are considered dangerous. Photos and the student-generated description should be posted on the word wall (in the classroom or online).

The teacher should ask the students if they have ever seen someone start sneezing and itching after touching any of these plants.

Step 8: Extensions

The teacher will save the seeds from the sock walk.

Have available some paper cups, and potting soil or dirt to demonstrate and instruct the students to:

1. Punch some holes in the cups for drainage.
3. Fill the cups $\frac{3}{4}$ full of dirt (leave some room for watering).
4. Water the new soil so it is damp.
5. Plant several seeds of the same kind in your planter.
6. Put the planters in a sunny spot and water them regularly. When the soil feels dry give it a little water.

The plants will all look a bit alike at first, but as they grow you will be able to see some of the differences.

The teacher may also ask students to take photos of their seeds and post them to debugthemyths.com. They can compare their seeds to the photos of seeds that are posted from other students in different parts of the country to see if their seeds seem unique to their area.

Step 9: Assessment

The teacher asks the students to revisit the 'parts of a plant' card, sort, and correctly attach labels to the parts of a plant on some plant photos. Each student will then create a definition for the concept of "weeds" and will identify which seeds came back in the highest numbers and why.

Seed Sources:

Seeds: America the Beautiful Free Seeds.

http://www.america-the-beautiful.org/FreeSeeds_order_form.htm

You must fill out this form.

<http://www.tomatobob.com/Free%20Seeds%20For%20Schools.htm>

Contact your local university extension office, garden club, or local nursery.

Standards Addressed:

Abilities necessary for scientific inquiry:

- Ask questions about objects, organisms, or events in the environment.
- Employ simple equipment and tools to gather data and extend the senses.
- Use data to construct a reasonable explanation.
- As a result of activities in grades K-4, all students should develop understanding of the parts of plants and the concept of weeds.

Grade K-4 Life Science:

- The characteristics of organisms
- Life cycles of organisms
- Organisms and environments

Objectives:

- Students will explore the world around them by gathering seeds and learning about what plants live in their communities and around their schools.
- Students will learn about the different parts of the plant and how to identify the difference between good plants and harmful plants.

Assessment:

Given photos of actual plants, the students will be able to identify leaves, stems, seeds, and roots and give the rule they are using to identify each different part.

Materials List:

- ❑ Weed photos
- ❑ Plant part photo (with labels)
- ❑ Chart paper or white board
- ❑ Socks
- ❑ Newspaper
- ❑ Tape
- ❑ Hand lenses



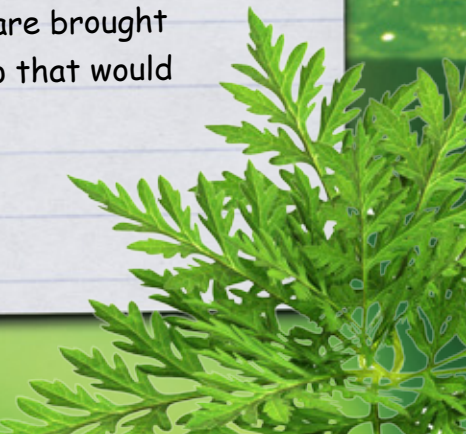
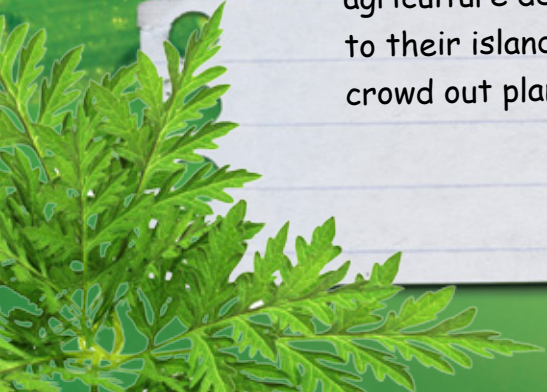


Background

The world is full of plants. Some are grown indoors, some for food, some outside for beauty, and some grow wherever they can. A plant growing anywhere it is not supposed to be is considered a weed. A plant other than corn growing in a corn field is a weed. A vine in the south that was planted for beauty a long time ago, Kudzu, has grown and grown until it has crowded out many of the plants that were there before. When a gardener or a farmer wants to grow a specific plant and another plant that grows like crazy tries to take over, that crazy plant is considered a weed.

Some weeds, like crabgrass, try to take over the grass lawns on which we play. Other weeds, like poison ivy and poison oak, can be dangerous to humans. Even ragweed, which grows all over the United States, can cause sneezing and runny eyes. It is important to be able to identify these harmful plants.

Scientists do not know how many plants are on our planet. There could be 20 million or as many as 100 million. The most common plants are grasses. The largest plants you may know about are trees. Plants can be identified by observing their leaves, stems, and roots. Leaves can be many different colors, shiny or dull, large or small, and have different shapes. Even the seeds of plants can be used to help identify them. Some seeds attach to the fur of animals and can travel long distances from where the original plant lived. Some seeds travel on the wind or water. Dandelions have seeds that are light and float on air. Some plant seeds even hitchhike their way across the country or ocean in someone's suitcase or clothing. In Hawaii the agriculture department carefully monitors plants that are brought to their islands. They do not want any plants to show up that would crowd out plants that already live there.



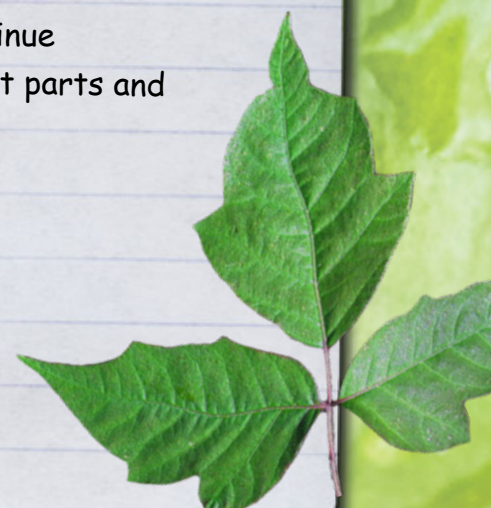


It All Starts With Observation (Brainstorm)

Ask the students:

"How many of you have seen a weed growing in the ground?
Can you tell me what it looked like?
I will write what you describe on the board."

The students will offer their descriptions and ideas. Continue prompting the students with questions about the different parts and characteristics of the plants, such as:


- What kinds of leaves did your weed have?
 - Were they large or small?
 - Were there lots of leaves or just a few?
 - Was the plant tall or short?
 - Was the weed growing in a lawn or in a sidewalk?
 - What color was your plant?
- 

Formative Pre-Assessment

After you have recorded the students' ideas about weeds on the board or chart paper, give the students a chance to add any facts or descriptive words about weeds and plants.

Next, have the students write on a sheet of paper, or in their science journals, simple facts they know about weeds. Have them write their own definition for the word "weed." Circulate around the room and read these definitions. These will tell you what misconceptions the students have about the concept.

Next pass out the set of plant-part cut-out cards with separate drawings or arrows pointing to roots, stems, and leaves. Have the students organize these cards into sets (all leaves, all stems, etc). Have the students share or write in their journal what rule they used to organize the cards.



For this activity, use the pull apart cards with photos of various plant leaves, stems, and roots.

Refining the Observations

Hold up a photo of a weed and ask the students to give good describing words for the plant. Write the words on the word wall as the students share. You will want to use more than one of the weed photos for this discussion. You may want to prompt the students to refine their observations by asking some of the following questions:

- What color are the leaves in this plant?
- What shape are these leaves?
- What word would you use to describe the stem of this plant?

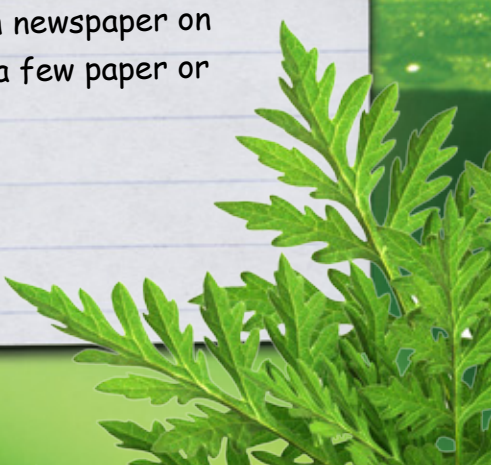
Now ask the students to brainstorm where plants and weeds can be found around their school. Prompt the students to identify where they see more weeds in these locations and why they would consider these plants weeds.


Read Aloud

Ask the students, "What is a weed?" After the students have their definition on the board, read the book "What's Bugging You?" aloud to the class. Pause frequently to allow students to share stories of plants their parents have considered "pests" around their home.

Sock Walk (Investigate)

A few days before the activity ask the students to bring some old socks to school. Explain that these socks will be used in a science lesson on weeds and seeds. Set up the classroom with newspaper on the desks or tables for when you return, and gather a few paper or plastic bags for the socks after the walk.





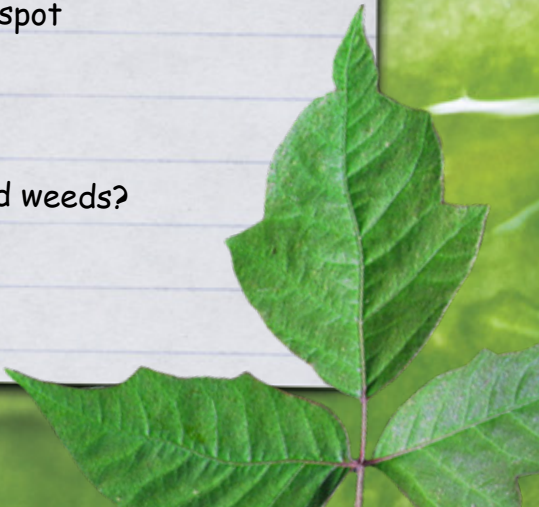
Select a location around school where there are grasses or leaves that the students can safely walk through.


Take the students outside and have them pull the socks on over their shoes. Then, guide the students on a walk through several locations where they might pick up seeds on their socks. After the walk have the students carefully take off their socks and place them in the bags and return to the room.

Rainy Day Alternative (or alternative for kids with severe allergies): Place a large assortment of seeds gathered in advance of the lesson in a large box. Have students place socks on their hands and move their hands around the box so that some of the seeds attach to the socks.

Place the socks on the newspaper-covered desks and have the students examine the seeds their socks picked up. Have the students sort the seeds and see which type of seed was gathered in the greatest number. Have the students make a pictograph with the type of seed and the number.

Your students should discuss the pictograph and the counts, and make observations. Continue the discussion by asking questions such as:

- How do you think this seed would travel from one spot to another?
 - Could any seeds travel through the air or water?
 - Describe the seeds that had the highest number.
 - Do you think any of your seeds could be considered weeds?
- 



Ask the students if they know how seeds can travel from one area to another. As you discuss this question ask the students to identify any seeds in their collection that could travel in that way. Are there any seeds that stuck tight to the socks? Are there seeds that could float on the wind? Focus the students on the concept of adaptation and that plants that do not belong where they were found can still live there.

Weed Detective (Investigate)

Tell the students that detectives are good at observing things. Now they are going to become weed detectives. Hold up cards with the three main parts of a plant labeled root, stem, and leaves. Have the students repeat the parts as you point to each part in the photo. Give each student a sheet with these three parts and a space for writing or drawing (enclosed or available for download). Lead the class outside again and have each student select a secret plant in the schoolyard to study. Have them sit beside their plant and describe in words and drawings each part of their plant, except the roots, as they may not be visible. After allowing time for recording observations, have the students trade sheets with another student. Ask this second student to look around the schoolyard to try to identify the plant from the word description and drawings. Have the students reconnect with their detective partner to see if they were able to correctly identify the plant that was described.

Have the students look through "What's Bugging You?" to find the most unwanted weeds and see if any of their schoolyard weeds fit that description.

Dangerous Weeds (Remember)

Explain to the students that there are some weeds that are dangerous. Ask them if they know the names of any dangerous weeds. Pass out three dangerous weed cards to each student. The set includes photos of poison ivy, poison oak, and ragweed.

Give each student a post-it note and have them write describing words for each of the dangerous plants. Then, have them trade post-it notes with another student to see if they can use only the description to identify the plant that matches.

On the board, guide the students to develop a class description of each of the dangerous weeds.

Assessment

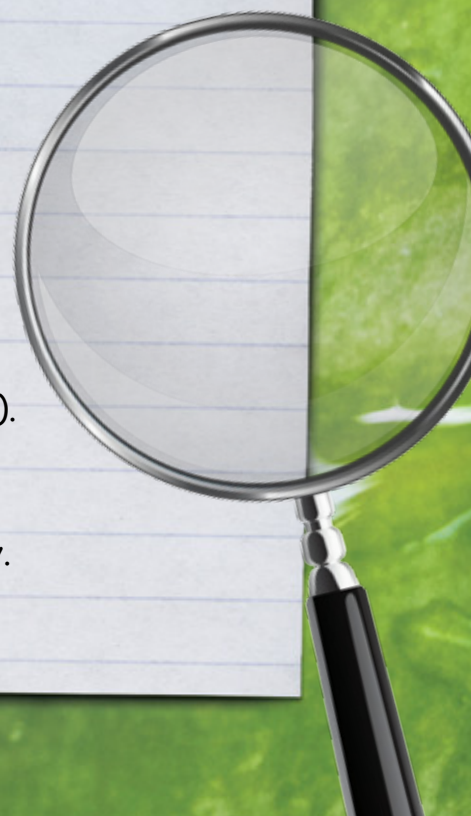
Have the students return to the card of plant parts. Ask them to hold up one plant part and tell why they are labeling that a leaf, a stem, or a root. You may want to have them record their rules in their science notebook. Direct the students to the class definition of a weed and offer any revisions based on their new learning. Ask them why the seeds they gathered in the largest number might be considered weeds.

Extension

Save the seeds from the sock walk.

Have available some paper cups, and potting soil or dirt to demonstrate and instruct the students to:

1. Punch some holes in the cups for drainage.
2. Fill the cups $\frac{3}{4}$ full of dirt (leave some room for watering).
3. Water the new soil so it is damp.
4. Plant several seeds of the same kind in your planter.
5. Put the planters in a sunny spot and water them regularly.
6. When the soil feels dry give it a little water.



"What's Bugging You?" Feedback

Thank you for using "What's Bugging You?" in the classroom. To help us improve on this lesson plan and future lesson plans we may develop, please provide feedback using the form below, or simply e-mail us at becky.johnson@fleishman.com.

1. Using the scale below, how would you rate the effectiveness of the "What's Bugging You?" lesson plans?

- 1 = Very effective
- 2 = Effective
- 3 = Neutral
- 4 = Ineffective
- 5 = Very ineffective

2. Which activity in the lesson plans did you find to be the most popular with your students? Which activity did you, as an educator, find the most effective?

3. What suggestions do you have to improve on the lesson plans?



Debug
THE Myths