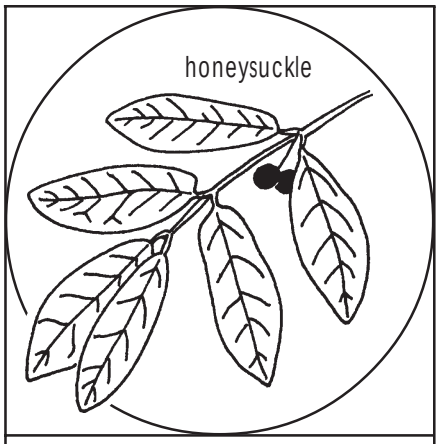
Invasive or Not?



Method

Students will visit a natural area and observe native and non-native plants. They will use a checklist of invasive characteristics to predict whether a plant is invasive or not. They will check their predictions by identifying the plant and checking its status.

Getting Ready

1. Make copies of the drawing on page 32 or copy it on a transparency for classroom viewing. Make one copy of the *Invasive or Not?* worksheet on pages 33 – 34 for each team of students.
2. Locate an area with a wide variety of native and non-native plants. While several groups of students can observe the same kind of plant, each student group will need access to a specimen.

Introducing the Activity

One of the many challenges of managing invasive species is identifying an invasive plant *before* it has become a problem. Some countries (e.g., New Zealand) and states (e.g., Hawaii) have implemented Weed-Risk Assessment programs. These programs try to screen plants before they are permitted to enter a new area. The screening process looks at the:

- Plant's observable adaptations. (Is it equipped with thorns, toxins, or other defenses? Does it stay green and photosynthesize all winter? Does it grow quickly?)
- Plant's reproductive potential. (Does the plant produce a lot of seeds? Can the plant spread vegetatively by runners or rhizomes?)
- History of the plant. (Is the plant invasive in other parts of the world? Has it repeatedly invaded new areas?)
- History of the plant's relatives. (Are the plant's close relatives invasive in this location or others?)
- Attitudes of people. (Do people want to cultivate/own the plant? Plants people want are planted frequently and are more difficult to keep from spreading.)
- Climate of the plant's native range. (Is the plant's native climate similar to the climate of the new location? Has the plant proven that it can survive in a wide range of conditions?)

Objectives

- Recognize invasive characteristics in plants.
- Identify at least one invasive plant.

Grades

6 – adult

Group Size

Small groups of 2 – 3

Activity Time

Two 50-minute periods

Setting

Outdoors in spring, summer, or fall

Materials

- Copy of *Invasive or Not?* illustration (page 32)
- Copies of *Invasive or Not?* worksheet (pages 33 – 34)
- Clipboards
- Pencils
- Trowels, pruners, scissors for collecting plants
- Plastic bags for holding specimens
- Plant identification books (See list on page 139.)
- **Invasive Plants of the Upper Midwest**

Connections

See next page.

Academic Standards

Grades 6 – 8
- Science: C.8.2, C.8.4, C.8.5, F.8.2

Grades 9 – 12
- Science: C.12.3, F.12.7, F.12.8

Weed-Risk Assessment programs are not possible or even practical for every place in the world. However, trying to identify and prevent potentially risky plants from entering countries is a great idea. This lesson includes a simplified version of a weed assessment tool that highlights invasive plant characteristics.

Doing the Activity

1. **Display the illustration on page 32.** Ask students to count how many different plants are in the illustration. (Four: Jack-in-the-pulpit, spring beauty, garlic mustard, and basswood.) Ask students what they notice about the plants.
2. **Pass out the *Invasive or Not?* worksheet.** Ask students to read over the sheet. As a group, use the worksheet to evaluate the garlic mustard in the illustration.
3. **Gather equipment and travel to the outdoor study area.**
4. **Divide into groups.** Instruct each group of two or three students to choose a plant to evaluate.
5. **Compare checkmark totals.** Ask each group to tally their checkmarks. Which plant received the highest invasiveness score? Which plant received the lowest? As a class, visit these plants.
6. **Discuss results.** Based on the field work, ask students if they think any of the plants they evaluated could be invasive.
7. **Confirm predictions.** Take samples of any possible invasives back to the classroom. Bag the plants at the collection site so that you do not spread seeds! Use plant identification books to identify the plant/plants you collected. Confirm whether the plant is invasive by using the tables on pages 195 – 204 in **Invasive Plants of the Upper Midwest**.

Assessing the Learning

Assess students' ability to use the checklist to evaluate a plant's invasive characteristics.

garlic mustard in flower – second year

garlic mustard – first year

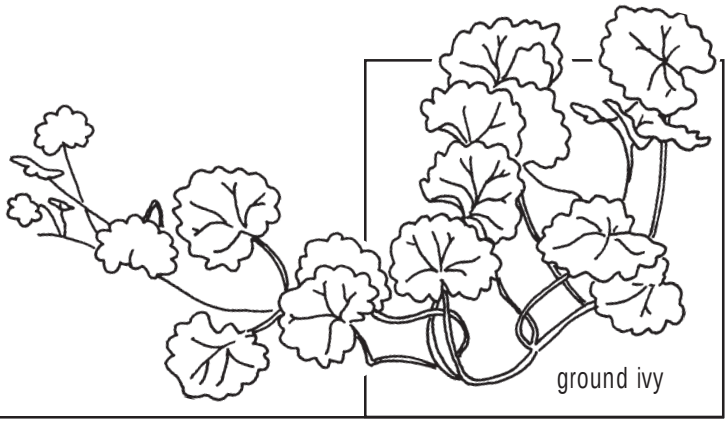
Jack-in-the-pulpit

spring beauty

Extending the Learning

Investigate current laws. Several legislative acts give authority to exclude certain species from entering the United States. Ask students to find out about current and pending legislation. <www.invasivespeciesinfo.gov> Discover how authority over border protection has changed since recent terrorist attacks, the passage of the Patriot Act, the formation of the Office of Homeland Security, and the creation of the "Intelligence Czar." Investigate black lists (banned species), white lists (permitted species), and pied lists. (Pied lists contain banned species and approved species. All species not listed are regarded as potential threats to biodiversity, ecosystems, or economy.) Discuss with students why so many people are opposed to the adoption of the "white list" approach. Debate which list would best protect America's biodiversity.

Check out Australia's invasive species awareness campaign. Making people aware of the problems that invasive species cause is one way to slow the intentional and unintentional introduction of new species. Australia, with its unique plants and animals, has suffered vast ecological and economic damage from non-native invasive species. They may be way ahead of us when it comes to protecting their homeland from invasives. They've even enlisted the help of the Crocodile Hunter, Steve Irwin! Ask your students to visit their Web site at <www.affa.gov.au> and follow the links to Quarantine and Export Services. They have extensive lists of permitted and prohibited items. Find out why a country has no problem with you bringing in fruitcake, but will confiscate your citrus tea! Check out their Biosecurity Australia publications page to get an idea of how seriously they take this issue. Challenge students to create an awareness campaign for the United States. Who could be our spokesperson? What TV, print, radio, or video strategies could raise awareness?



Invasive or Not?

Invasive or Not?

Whether a plant is invasive or not depends on the plant's characteristics and its location. You will not be able to answer some of these questions at certain times of the year, but do your best. Place a checkmark next to each feature that describes your plant or its surroundings. When finished, add up the checkmarks.

Plant name

(actual name or name you have given it) _____

Location _____

Displays Desirable Characteristics

Some invasive plants are very beautiful and have been planted and cultivated in gardens. Sometimes they escape to natural areas. Check all the desirable characteristics that your plant has.

- ☐ Beautiful flowers? Look for showy or colorful blooms.
- ☐ Interesting foliage? Look for variegations, unusual color, or large size.
- ☐ Screening potential? Look for thick branches and/or foliage that could provide privacy or hide something from view.

Exhibits Bullying Behaviors

Invasive plants are usually aggressive and tend to crowd out other plants. Check all the bullying behaviors that your plant exhibits.

- ☐ Grows up and over other plants - often smothering them?
- ☐ Forms dense thickets that the sun cannot penetrate?
- ☐ Leafs out early in the spring and uses light, water, and soil nutrients before native plants?
- ☐ Stays green all winter, continuing to use resources while other plants are dormant?

Defends Itself

Invasive plants are often armed and dangerous! Check the defenses that your plant posesses.

- ☐ Spines, thorns, or burs?
- ☐ Allelopathy? Allelopathic plants produce substances that inhibit the growth of surrounding plants. Look around. Do you see any other kinds of plants growing nearby?

Produces and Distributes Lots of Seeds

Invasive plants usually produce many seeds that mature quickly. The seeds can often disperse long distances. Check all the boxes that match your plant's seed adaptations.

- ☐ Too numerous to count?
- ☐ Dispersed by the wind? Look for seeds with parachutes or helicopters.
- ☐ Edible? Look for nuts, fruits, or berries that animals can move around.
- ☐ Sticky? Look for burs or hooks that allow the seeds to catch in fur, feathers, or fabrics.
- ☐ Able to float?
- ☐ Tiny?

Reproduces in More than One Way

In addition to seeds, many invasive plants spread by vegetative reproduction. Check all the ways that your plant appears to spread.

- ☐ Rhizomes (underground stems)?
- ☐ Stolons (above-ground stems)?
- ☐ Runners?
- ☐ Tubers?
- ☐ Bulbs?
- ☐ Ability to produce new plants from fragments? Look for tiny rootlets at the stem nodules.

Shows Few Signs of Being Eaten

Native herbivores often overlook or avoid invasive plants. Some plants are toxic or unpalatable; others simply are not familiar as food choices. Check the signs that show your plant is not being eaten.

- ☐ Few or no chewed leaves?
- ☐ No leaf miners?
- ☐ No damage to stem/trunk?
- ☐ No fungi? Look for molds, mildews, and powders on the leaves and stems.
- ☐ No galls?

Tolerates a Range of Conditions

The more adaptable a plant is to wide ranges of conditions, the more likely it is to be invasive. Look around. Check each place you see a plant like yours growing.

- ☐ In the sun?
- ☐ In the shade?
- ☐ In wet soil (lowland)?
- ☐ In dry soil (upland)?

Benefits from Disturbance

The more disturbed an area is, the more likely it is to have invasive species. Look around. Check each sign of disturbance that you observe.

- ☐ Foot traffic?
- ☐ Vehicle traffic?
- ☐ Construction of trails, steps, boardwalks, roads, parking lots, etc.?
- ☐ Grazing by cattle? In a forest, look for old fencerows. Do you notice large trees and small trees, but no medium-sized trees that would indicate the forest was grazed at some time?
- ☐ Floods?
- ☐ Storm damage?

Invades Natural Areas and Displaces Native Species

If you are in a natural area, look around the plant you are observing. Is it dominant? How many other kinds of plants do you see? Check all the boxes that apply.

- ☐ In a three-foot radius, is this the dominant plant species growing?
- ☐ In a three-foot radius, are most of the seedlings the same species as the plant being studied?

Total number of checkmarks _____