

Means & Modes

Method

Students will pull objects from a box to brainstorm the ways that people knowingly and unknowingly spread invasive plants.

Getting Ready

1. Look through the list of *Means & Modes* items and choose the ones appropriate to your audience, topic, and personal knowledge level.
2. Gather the actual items or representative items (e.g., a toy SUV) and place them in a box. **Optional:** You can also simply write the name of each item on an index card to place in the box.

Introducing the Activity

Have you ever picked up a hitchhiker, smuggled an alien through customs, or purchased an illegal substance? If you think not, think again! No doubt at some point in your life you have, either knowingly or unknowingly, helped a potentially invasive species enter new territory. Most invasive species are incredibly adaptable and can take advantage of opportunities for invasion. However, they rarely swim across oceans, walk over mountain ranges, or hop continents without help from people! Let's find out how invasive species get around and how we might stop giving them a hand.

Doing the Activity

1. **Select items from the box.** Let students take turns selecting items from the box. If you have more students than items, ask students to work in pairs.
2. **Brainstorm connections.** Ask students to think about their items and brainstorm how they might be connected to the spread of invasive species. The items in the box simply serve as springboards for ideas. There are no right or wrong answers. Encourage them to think creatively!
3. **Share ideas.** Allow students to share how they think their items contribute to the spread of invasives. **Note:** Refrain from telling everything you know about each item. Keep the activity moving!
4. **Wrap up the activity.** Ask some of these questions:
 - Did this activity help you think of a time when you might have transported an invasive species?



Objectives

- List everyday activities that can contribute to the spread of invasive species.
- Realize that people spread invasive species both knowingly and unknowingly.
- Analyze personal actions related to the introduction and spread of invasive species.

Grades

3 – adult

Group Size

Individuals or pairs

Activity Time

20 – 40 minutes

Setting

Anywhere

Materials

- Items representing ways people spread invasives (See list on page 81.)
- Box

Connections

See next page.

Academic Standards

Grades 3 – 4

- Environmental Education: B.4.12, D.4.3
- Social Studies: A.4.4, A.4.8

Grades 5 – 8

- Environmental Education: B.8.10, D.8.5
- Social Studies: A.8.7, D.8.11

Grades 9 – 12

- Environmental Education: C.12.1, D.12.4

Scout Connections

- Boy Scouts: Leave No Trace, Camping, Hiking
- Junior Girl Scouts: Camp Together, Your Outdoor Surroundings
- Cadette and Senior Girl Scouts: Backpacking

- Would you share the circumstances with the group?
- Now that you know more about how potentially invasive species move from place to place, what will you do about it?
- Can any of these pathways of invasion be controlled or stopped? How?
- Do you think it is the job of the government or individuals to control the spread of potentially invasive species? Why?

This activity is adapted from “Means & Modes.” **Non-Native Invasive Species Learning Kits — Close the Doors.** United States Forest Service. 2005.

Assessing the Learning

Observe student participation in the discussion. Ask students to choose an item from the box, find out which invasive species might be spread by that item, and suggest ways to prevent the spread. For example, if you wear hiking boots in an area infested with garlic mustard, you are likely to pick up garlic mustard seeds. Thoroughly cleaning the mud off boots before leaving the infested area helps to prevent the accidental spread of seeds into new areas. It would also be a good idea to shake out your boots and brush off your clothes.

Extending the Learning

Leave No Weeds. In many ways, people who love the outdoors are the ones with the most to lose when invasive plants are concerned. Invasives can completely change the land – reducing recreational opportunities, limiting access to areas, and spoiling the diversity and beauty of wild places. Because people who love the outdoors have so much to lose, they have a vested interest in doing everything possible to stop and/or slow the spread of invasive plants. Ask students to develop a code of outdoor ethics that would stop or reduce the spread of invasive plants. See page 82 for a sample Leave No Weeds code of ethics based on Leave No Trace principles. Visit the Leave No Trace Web site for tips on reducing recreational impact to public wildlands. <www.lnt.org>

Investigate commercial seed mixes. Many companies offer seed mixes that are “guaranteed to grow.” These mixes are often advertised as “meadow wildflowers” or “butterfly plants.” The marketing strategy uses words like “robust plants” or “aggressive bloomers.” Investigate what these mixes *really* contain. Are the plants native to the places where they are marketed? If the plants are non-native, are any invasive? Try growing a commercial seed mix in a greenhouse or indoor planting box. Did you grow anything not on the seed list? Check out research done by the University of Washington. <www.washington.edu/newsroom/news/202archive/04-02archive/k041802a.html>

Means & Modes Items

- **Bait container** – What do you do with leftover bait? Have you ever dumped store-bought worms on the ground?
- **Shoestring from hiking boot** – How could shoestrings spread invasives? Have you ever gotten seeds stuck in your shoestrings? What did you do with them? What do you do with the mud that gets stuck in your boot tread?
- **Hay for pack animals** – How could the diet of a pack animal be related to the spread of invasive species? When would you have to start feeding certified “weed free” hay to your pack animal before taking a trip into a restricted area?
- **Dirt bike** – How could vehicles like 4X4s, dirt bikes, and SUVs transport invasive plants? How might an “off road” or “off trail” vehicle damage the landscape? How could this damage increase the number of invasive plants?
- **Landscape tag** - Do landscape tags indicate if a plant is native or non-native? Why do you think nurseries sell plants that are known invasives?
- **Mailable seed packet** – What are some problems with picking up seeds on vacation and mailing them to your friends? How can seeds native to one state/country be a problem in another?
- **Dog** – Do seeds ever get stuck in pet fur? What do you do with the seeds?
- **Birdseed** – What kinds of seeds are in birdseed? Do birds completely digest all the seeds they eat? What problems could undigested seeds cause?
- **Tent stake** – Have you ever had seeds or soil stuck on your camping equipment? What have you done with the seeds? What kinds of seeds do you think invasive plants might have?
- **Plane** – How could the inside or outside of a plane transport invasive species?
- **Military equipment** – Military equipment is used all over the world. What kind of species could military equipment transport?
- **Luggage** – People travel all over the world. What could happen if they decide to carry food items, plant specimens, seeds, or wild animals from place to place?
- **Firewood** – What kinds of invasive species could firewood transport?
- **Livestock** – How could cattle, sheep, pigs, or other livestock transport invasive species? Think about what happens to the food they ate before they were transported.
- **Construction equipment** – How does development add to the problem of invasive species? Besides moving invasives on tires, can you think of ways the disturbance caused by construction adds to the problems with invasives?
- **Carabiner** – What precautions should people take when they venture into wilderness areas to participate in extreme sports?
- **Tractor** – How could raising crops encourage invasive species?
- **Blaze orange cloth** – Could hunters transport invasive species to new areas? How could hunters be sure they don't move invasives?
- **Dried flower arrangement** – How could a discarded wreath or flower arrangement be a problem?
- **Mowing equipment** – How could mowing equipment result in the spread of invasives? Do workers ever clean mowers?
- **Soil** – Think about what is in soil. What if it contained dormant plant parts?

Leave No Weeds

Adapted from *Leave No Weeds*, Lolo National Forest, Missoula, Montana.

1. **Be aware and prepare!** Be aware of and learn to identify plants in your region.
 - Know what invasive plants to expect in the areas you visit.
 - Brush and clean your shoes, clothes, pets, vehicles, and equipment when leaving an infested area to remove hitchhiking weed seeds and other reproductive plant parts.
 - If using livestock or pack animals, feed them *Certified Weed Seed Free* feed before and during backcountry trips. Animals can spread viable seeds after ingestion.
 - Clean your boat thoroughly before transporting it to a different body of water.
2. **Camp and travel carefully.** Don't be the person who brings an invasive species to a pristine area! Using equipment in or walking through weed patches will spread seeds. They'll stick to your vehicle, tent, shoes, and whatever else you have and hitch a ride to a new spot.
 - Stay on designated roads and trails – going off the beaten path helps to distribute seeds and creates soil disturbances where weeds can spread rapidly.
 - Use established campsites when possible – new campsites create disturbances where weeds can thrive.
 - Rid camping gear, shoes, and clothing of dirt and seeds before each trip and at every campsite.
 - Avoid camping in or hiking through weed-infested areas.
3. **Pull it out, pack it out.** If you find an invasive plant that hasn't gone to seed, PULL IT OUT! If it has gone to seed, at least remove the flowers or seed heads and bag them.
 - Refrain from picking wildflowers or plants, many of which may actually be invasive plants. Picking and transporting them can spread their seeds to new areas.
 - Pull only species that you can identify, and pull only taprooted species. Pulling plants with rhizomes, like leafy spurge, can help increase their rate of spread!
 - Try to get the whole root.
 - Wear gloves for protection against thorns and toxic chemicals produced by some plants.
 - Try to minimize soil disturbance when pulling weeds.
 - And remember – pulling weeds that have gone to seed can help spread the seeds. Better to leave those plants alone, or put the seed heads in a plastic bag and PACK THEM OUT. Don't pick or transport unidentified plants.
4. **Report it.** If you find a new invasive plant not yet established in your area or a small, isolated patch of common invasives, notify the authorities. This could be the landowner, Department of Natural Resources, Forest Service, etc, depending on where you found the plants.
 - Make sure you can give an exact location! If managers can catch infestations while they are new and small, they have a much better chance of controlling them.
 - In Wisconsin, report infestations of invasive plants just entering the state to the Wisconsin Invasive Plants Reporting and Prevention Project. <www.dnr.wi.gov/invasives/futureplants>