

Ivy the Invader: An Active Game about the Impacts of Invasive Plant Species

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Grade Level: 2-5

Subject Area: Science

Duration: 20 min of active game time

Description: In this game, a forested park (Eg. the students) is invaded by “Ivy the Invader” (1-2 students). Plant species battles are waged by rolling large dice.

Learning Objectives:

At the end of this activity, students will be able to:

- Describe biodiversity as it relates to plants
- Recognize different plant growth forms (trees, shrubs, fern and flowering herbaceous plants)
- Describe how an invasive species such as Ivy impacts biodiversity of a forest

Materials:

- Plant species cards (*Tip:* You can print coloured cards on cardstock and “lamine” the cards with clear packing tape, if it is not possible to laminate the cards)
- Use the card slides 1-10 if you have a class of 24 or less.
 - Use the additional cards 11-15 if you have more students. There are enough cards for up to 36 students.
- ~12 large foam dice (1 die per 2-3 students)
- Large bag/container to hold dice and small bag/container for the Ivy the Invader cards
- Large open area (E.g. Gym or field)

Instructions:

Before starting the activity:

- Discuss the difference between trees, shrubs, ferns and flowering (herbaceous) plants
- Discuss the difference between native and invasive species
- Introduce Ivy as an invasive species
 - Students may use the associated “The Plants Among Us” guide to research the above concepts. Note that flowering plants in the game are labelled as ground plants in the guide.

Ivy the Invader Game

- Select 1-2 students to be “Ivy the Invader”. With 24 students, you can have 2 Ivy the Invaders. With a smaller class, 1 Ivy the Invader should be sufficient. If the class is larger (36), you can add a 3rd Ivy the Invader at the beginning.
- Hand out the other species cards with 1 species card to each student.
- Use the cards on pages 1-10 if you have a class of 24 or less.
 - Use the additional cards on pages 11-17 if you have more students. There are enough cards for up to 36 students with 3 Ivy the Invaders. The additional Ivy the Invaders will be handed out as Ivy takes over the forest.
- Have students read the directions on their cards.
- Line students up according to their plant category which is listed at the bottom of the plant species card (Tree, Shrub, Fern or Flowering Plant)
- The students should see that there are many flowering plants and ferns, fewer shrubs and fewer trees
- Briefly discuss the concept of biodiversity and go over the rules of the game (Eg. no running, no tackling, or other roughhousing, etc)
- Ask the students to spread out around the field or gym
- Give one die to “Ivy the Invader” who will approach and battle other plant species by rolling the die.
- Use the rules on the plant species card to decide who the winner is. If Ivy the Invader wins, take the plant species card and provide the student with an Ivy the Invader card, and new die, if there are still die to hand out. The new Ivy the Invader can now go and battle other plants.
 - Note that trees are harder for Ivy to kill, so it takes 2-3 rolls of same number for Ivy to take down a tree. This situation could occur between 1 Ivy the Invader and a tree, or two Ivy the Invaders and a tree (for maple, cottonwood and willow) and three Ivy the Invaders for Cedar, in which case each of the students would roll the die once.
- Continue the game until all the Ivy the Invader cards are handed out, or you feel that sufficient time has passed.
- Have the students line up again according to their plant categories to see how the diversity of the forest has changed. What species are left? Why might they have survived? What does the forest now look like? How has the biodiversity changed?
- If you are conducting the activity in a park, you may be able to have the students locate Ivy and observe how Ivy has changed the diversity of an area where it has invaded.

Teaching Notes:

The plant species included in the game are those that are typical of many urban forested parks in New Westminster, Vancouver and the Fraser Valley. The plant species are separated by their growth characteristics into trees, shrubs, ferns and flowering (herbaceous) plants. Both trees and shrubs have woody stems, but trees are taller than shrubs and have one main thick trunk. Shrubs are shorter than trees and have many small woody stems coming from the base of the shrub. Ferns versus flowering herbaceous or annual plants? These look alike, but reproduce by producing spores rather than seeds, and they do not have flowers. Flowering plants all reproduce by seeds. Spores are a single cell and are microscopic, whereas seeds are larger and have a thick outer covering that protects the young plant embryo inside. Forests in the Vancouver region are very moist which allows ferns that produce spores to thrive. Spores are very susceptible to desiccation, so ferns do not do well in drier areas.

Why is Ivy so invasive in our urban parks? Many people plant Ivy in containers and gardens from which Ivy can easily escape into surrounding natural areas through the spread of seeds. Many bird species feed on Ivy berries and they can spread Ivy even further. Once established, Ivy can very quickly cover the ground and smother small plants and shrubs creating what are known as “Ivy deserts or Ivy barrens”. Ivy can also grow up trees, deform and break tree stems and branches. It can shade out leaves of deciduous trees and increase the chance that a tree will be damaged or blown over after a heavy snowfall or high winds. Deciduous trees that drop their leaves are more vulnerable to Ivy which is an evergreen and can grow through the winter.

References

Elliott, C. 1995. The ivy debate: Is this vine a friend or foe? Horticulture 73(3): 21-25

Strelau, et al. (2018) The Biology of Canadian Weeds: 157. *Hedra helix* L and *Hedera Hibernica* (G. Kirchn.) Bean. Canadian Journal of Plant Science <https://doi.org/10.1139/cjps-2018-0009>

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