**Schoolyard Plant Bingo Activity Outline**

**Topic:** Plant species identification (native- and non-native species)

**Target Grade Range:** elementary and secondary

**Time:** 30 minutes (could extend with discussion)

**Category:** Observe, connect to place

**Summary:** Students practice observation skills using a photo “bingo” card to explore and identify species around school property.

**Goals:**

* Students become familiar with species in their area (native- and non-native species)
* Students gain observation and identification skills.
* Students spend time outside observing and exploring their environment

**Objective(s):**

* Students become familiar with common native-, non-native, and invasive plant species in their area.
* Students understand what an invasive species is and the impact it can have on a native ecosystem

**Background knowledge:**

* No background information necessary. This can be used as an introduction to plant observation skills without needing to identify or name specific plant parts.
* Follow-up Resource: Introduction to invasive species video, Michigan Department of Environment, Great Lakes, and Energy (MI EGLE), *Invasive Species: The Basics* (<https://www.youtube.com/watch?v=yIgysZ5Hho8>)

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# **Procedure:**

# *Materials:*

* Camera
* Technology (for uploading pictures and formatting bingo card)
* “Plant Bingo Card Template” document
* Clipboards or other hard writing surface such as a book, whiteboard, or piece of firm cardboard (one per student or team)
* Writing utensil (one per student or team)

*Set-Up:*

* Survey the school property for invasive plants and take pictures of native- and non-native plants around school grounds.
  + Use identification apps such as Seek/iNaturalist to help identify the plants iNaturalist and Seek: (<https://www.inaturalist.org/>; <https://www.inaturalist.org/pages/seek_app>)
  + Local Cooperative Invasive Species Management Area (CISMA) personnel or websites may have information on common native and invasive species in your area to look for (<https://www.invasive.org/cismas/>)
  + Midwest Invasive Species Information Network (MISIN), (<https://www.misin.msu.edu/>) has a “species data viewer” map (<https://www.misin.msu.edu/webapp/mapviewer/>) to find previously-identified invasive species in your area.

Note: the MISIN resource is something students can add to if the class discovers a previously-unreported invasive species in their area. Partner with your local CISMA for support.

* Arrange the pictures onto a bingo card using the template provided.
  + Depending on the number of unique species in the area or the educational focus, multiple cards may be made.

Students might have a different combination of pictures on their cards.

* + Bingo cards might have a combination of native-, non-native, and invasive species depending on the plants in the region.
  + See the “Example Plant Bingo Hunt” or “Rain Garden Picture Hunt” PDF

*Activity Description:*

1. Review class outdoor standards for safe exploration such as those provided by Michigan Environmental Education and Curriculum Support (MEECS) 10 Tips for Taking Students Outdoors

Note: Students should not touch unknown plants in case of toxins or unknown allergies.

1. Hand out the bingo cards and allow students to look for the species in the pictures (checking off pictures found).
2. Gather back together
3. Discuss and summarize student findings

**Discussion:**

* Students share what plants they were able to find on their bingo card
* Discuss what features helped students make a match between the photo and plant
* If plant identification is of interest for a next step, introduce some of the suggested apps or use field guides to help identify what was found

*Sample inquiry questions based on data and observation are below* (allow for open discussion). Example student answers are in red.

* How did you decide that the plants you found matched the photo?
  + Leaf shape, color, etc.
  + Have students use descriptive terms to describe patterns such as shapes, leaf edges, plant/flower colors, etc.
* If focusing on invasive species, ask: What do you think makes these species invasive?
  + There are a lot of individual plants of the same species; they reduce diversity in ecosystems; they use up resources so other plants can’t access; they are able to reproduce faster/easier than native species; etc.

**Variations and Extensions:**

* Use only native plants on the bingo card to focus on native plant identification; have some cards with only invasive species; some cards with a mix of species. Design the bingo card based on the ratio of plants in an area.
* Compare the plants found in the schoolyard with another natural area.
* Have students make a similar bingo card from a local park or someplace near their home where plants grow (Students can be creative, plants grow in a vacant parking lot).
  + Assess diversity of plants in their chosen area
  + Students compare findings from their different areas
* For older students, focus on identification skills. Allow students to use identification apps and/or dichotomous keys to identify species
  + Seek by iNaturalist: (<https://www.inaturalist.org/pages/seek_app>)
* Use the center square of the bingo card as an open space for students to find and draw a new plant. To extend the activity further, have students identify and research their plant and share their findings with the class.
* Use the original search as a jumping off point to, introduce the idea of invasive species.
  + The Introduction to Invasive Species video is a good introduction to the topic (*Invasive Species: The Basics,* <https://www.youtube.com/watch?v=yIgysZ5Hho8>)
  + Use MISIN (or a CISMA professional) to give students an overview of the common invasive species in their area. Include distinctive features that may help them to identify the species on their bingo cards.

**Additional Resources:**

* Local CISMA finder (<https://www.invasive.org/cismas/>)
* Michigan invasive species website (<https://www.michigan.gov/invasives>)

**Research Connections:**

**Lake Superior State University Center for Freshwater Research and Education (LSSU CFRE) *Hydrocharis morsus-ranae* (European frogbit) research:**

CFRE research teams collaborate with EGLE and Three Shores CISMA to conduct field and lab experiments on the invasive plant European frogbit. The goal is to gain more knowledge on the distribution and winter survival of the species as well as how to effectively remove it.

**Lake Superior State University Center for Freshwater Research and Education (LSSU CFRE) *Didymosphenia geminata* (didymo) research:**

CFRE research teams conduct lab experiments and field sampling for didymoin order to understand what is causing the growth of the invasive algae. LSSU CFRE also conducts eDNA and water quality analyses. University of Wisconsin Oshkosh, Michigan Sea Grant, and EGLE all partner with CFRE on this project.

**Michigan Department of Education Standards**

**2-LS4-1** Make observations of plants and animals to compare the diversity of life in

different habitats.

**3-LS4-3** Construct an argument with evidence that in a particular habitat some

organisms can survive well, some survive less well, and some cannot

survive at all.

**3-LS4-4** Make a claim about the merit of a solution to a problem caused when the

environment changes and the types of plants and animals that live there

may change.

**5-ESS3-1** Obtain and combine information about ways individual communities use

science ideas to protect the Earth’s resources and environment.

*This activity provides background information to support the following standards:*

**MS-LS2-1** Analyze and interpret data to provide evidence for the effects of resource

availability of organisms and populations of organisms in an ecosystem.

**MS-LS2-4** Construct an argument supported by empirical evidence that changes to

physical or biological components of an ecosystem affect populations.

**MS-LS2-2** Construct an explanation that predicts patterns of interactions among

organisms across multiple ecosystems.

**MS-LS1-4** Use argument based on empirical evidence and scientific reasoning to support

an explanation for how characteristic animal behaviors and specialized plant

structures affect the probability of successful reproduction of animals and

plants respectively.

**MS-LS4-4** Construct an explanation based on evidence that describes how genetic

variations of traits in a population increase some individuals’ probability of

surviving and reproducing in a specific environment.