

Winter is Coming...to Minnesota Trees: Tree dormancy and ecosystems

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Session Goals:

1. Increase public awareness of nutrient cycling through leaf shedding and decomposition.
2. Provide visitors the chance to experimentally observe leaf decomposition.
3. Improve public knowledge of natural history (distribution, identification, ecology, physiology) of native trees.

Activities

Activity #1 – Litterbags, a tool for studying decomposition

Desired Learning outcomes:

1. Form hypotheses about how litter type (chemistry, morphology) and decomposition environment (water, light availability, organisms) affect decomposition of leaves.
2. Think about processes that affect decomposition and the ecological consequences of litter decomposition (recycling of nutrients, runoff/eutrophication, etc.).

Materials:

1. Nylon landscape mesh
2. Scissors
3. Heat sealer
4. Leaves (several species, preferably dry)

Lesson:

1. Show sample litterbags, describe how they are used, guide participants in thinking about what litter/environment will lead to slower or faster decomposition.
2. Heat seal three edges of each bag, so that each has an open top (can be done ahead of time).
3. Allow participants to fill bags as they wish.
4. Guide participants in the use of the heat sealer so that they can close their bags.

Activity #2 – Leaf Morphology

Desired Learning outcomes:

1. Observe and describe leaf morphology and gall-formation using light microscopy

Materials:

1. Light microscope
2. Various leaves (fresh or dried), especially those with galls.



Lesson:

1. Instruct participants in how to use a light microscope.
2. Ask participants what they expect to see before looking.
3. Compare to what they saw, discuss galls (plant tumors) and stomata.

Activity #3 – Resources on MN trees

Desired Learning outcomes:

1. Learn about the distribution and ecology of Minnesota's native trees
2. Visualize stem vasculature and understand how trees prevent freezing embolism.

Materials:

1. USGS range maps of common trees.
2. Field guides with illustrations (DNR guide to MN trees is good).
3. Other biology texts (esp. those with illustrations of leaf/wood morphology and anatomy).
4. Market Sci plastic tubs, chips, and mini-blackboard for polls.

Lesson:

1. Set up the blackboard, tubs, and chips to ask something like “What is your favorite tree?” or “Which MN tree has the best fall colors?” and ask people to vote.
2. This can be a lead-in to look at distribution maps and field guides. Have them open to popular trees on the table.
3. This can also be a chance to talk about stem vasculature and embolism (we made a poster, which is now in the Market Sci office).

Recommended age range

All ages

Recommended citation for this lesson plan:

Grossman, Jake. 2016. Winter is Coming...to Minnesota Trees: Tree dormancy and ecosystems. marketsci.org

