



The Arboretum for Educators

Resources for Teachers, Students, and Families

February 2025

Winter Natural Phenomena



Even during the coldest winters, natural phenomena abound. Plants are always responding to their environment. By observing and tracking these phenomena, students continue to learn that plants are dynamic and adapted for survival. Scientists have specific words to describe what is happening, and learning about it is fun when paired with actual hands-on observations and wonderings. The suggestions below, while assigned to grade levels, would be interesting to students of all ages.

PreK–Grade 2: Rhododendron Leaf Curl and Droop

Take students outside to observe a rhododendron or an azalea shrub. This evergreen normally has broad, oval shaped, thick leaves that are relatively flat and held at a horizontal position relative to the stem. When temperatures start to reach 32°, leaves respond first by drooping (changing direction towards vertical position) and as temperatures continue to fall below freezing, leaves begin to curl. The tightest curls occur at the lowest temperatures. [Read more about this phenomenon](#) called *thermotropism*.

Students can keep track of daily temperatures, sun exposure and take photos or create observational drawings of rhododendron leaves to understand cause and effect. Cut a small stem and place it in water indoors. Observe how the leaves respond to a change in temperature over time. Use flashlights and leaf paper models to understand why curling and drooping helps deflect sun intensity in winter. Continue to take weekly data and observe how the leaves respond as the winter season moves towards spring. The Arboretum website is a [good source of leaf images](#) as well.

Grades 3–5: Skunk Cabbage Heats Up!

[Introduce students to the Eastern skunk cabbage](#), a North American wetland plant that is one of the first to flower in late winter, even when there is still snow on the ground! It does this because the skunk cabbage can generate its own heat through a [phenomenon known as thermogenesis](#). There are plenty of skunk cabbages at the Arboretum, along our wetland areas, for investigation.

In the classroom, explore the idea of heat helping to transmit odors. Heat essential oils or burn scented candles and compare the intensity of the smell with non-heated oils and candles. Do some simple cooking by using an electric hot pot to make applesauce and enjoy the aroma. To approximate what

happens in a skunk cabbage, heat old kitchen scraps in a sealed container, or simply place the container in a sunny window or on a heater. Allow students to take a whiff! Imagine what experiments can be done if you locate an outdoor electrical outlet to see if your “skunk cabbage” attracts pollinators – beetles and ants in particular!

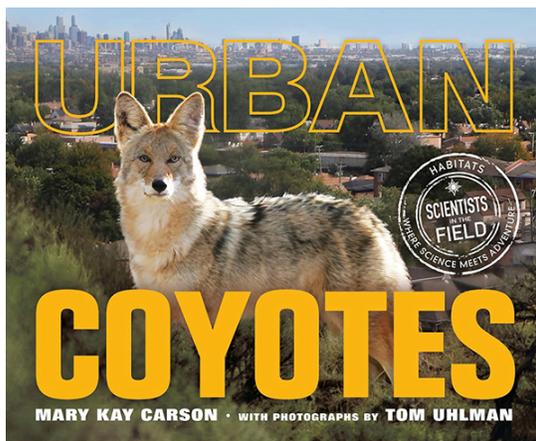
Middle and High School – Ice Flower Formations

The ephemeral – transient – nature of ice flowers makes them fascinating to learn about and a joy to discover in the landscape. Ribbons of ice are formed when (warm) moisture from inside the stem of a plant seeps through cracks and encounters (cold) air temperatures, thereby freezing water into intricate swirls, threads, and curlicues that resemble spun sugar or cotton floss. Your schoolyard may be growing such ice flowers and the best time to find them is early morning during spells of freezing temperatures.

This phenomenon is not unique to plants; there are ice formations that occur on ocean water, rocks, soil, and even metal pipes. They have their own names and methods, but all rely on a difference in temperature. This article from *American Scientist* shares tips on how to experiment creating your own ice ribbons.

While on the subject of heat, use these videos to explain thermogenesis for middle school, and for high school students.

More...



Coyotes make appearances at the Arboretum in February during mating season. Read this book about these common, yet elusive, animals and how scientists are tracking and studying their behavior.

One can hear territorial and courtship calls made by owls in February at the Arboretum. [Download and use this fun slide deck](#) to listen to owl calls and learn to identify 4 common MA owls.



The Arnold Arboretum of Harvard University, 125 Arborway, Boston, MA 02130

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