



The Arboretum for Educators

Resources for Teachers, Students, and Families

March 2025

Wind Driven Pollen: A Sea of Fertility



Pollination and pollinators are well known, studied and appreciated subjects in life science curricula. Who isn't fascinated by bees or enthralled by butterflies and bats? Less understood is the allergy inducing role of tree pollen and wind pollination. Yet, the story of pollination is incomplete without a study of this natural phenomenon that many people wish away.

Teachers can [read more about wind pollination](#) and [watch a video explaining conifer pollination strategies](#) for own learning. Then, be sure to check out these amazing [microscope pollen images](#) that will inspire art connections and curiosity at all grade levels! Scroll through to locate pollen grains carried by wind (pine, ragweed, plantain, oak, cryptomeria, birch, grass, corn, and alnus). What features do they have in common? Finally, check out this [National Allergy map](#) to track pollen count levels and allergy forecasts.

PreK–Grade 2: Close Observation and Modeling

On a sunny day bring students outdoors to examine yellow pollen on surfaces: on playground equipment, on water puddles or even cars. Search for the male and female flowers of the maples, oaks, birches, willows, and pines. You can also [show them these images](#), so they know what to look for. Have students collect pollen using sticky tape and use magnifying glasses to observe the powders.

Model wind pollination by clapping chalkboard erasers or squeezing puffs of talcum powder outside. Have students observe and describe the movement of the particles. Experiment with moving the air around the particles with increasing force: blowing, waving cardboard, using a handheld fan, or even watching nature's strong wind to observe how far the particles move. To help children understand how challenging it is for wind driven pollen grains to find a suitable female structure to fertilize (and also understand why a tree must create so much pollen!) place some sticky traps mounted on black paper along

the playground blacktop or nearby structures and see how much pollen lands on them and how far the grains had to travel from the source.

Grades 3–5: Compare Wind and Animal Pollination Strategies

In addition to the hands-on activities above, students can watch this [Seasonal Science video about pine pollen](#) from PBS Learning Media. Once students understand the mechanics of wind pollination, conduct a discussion about the efficiency of such a strategy for plant reproduction. Keep in mind that gymnosperms (mostly conifers) evolved earlier than angiosperms (flowering plants) and at a very different geologic time than today.

Flowering plants later co-evolved with pollinators who were able to carry larger, heavier grains of pollen to more targeted locations using scent-color incentives and nectar reward strategies. [This read-aloud](#) explains how Darwin thought about and theorized such relationships and how it took 130 years for his ideas to be proven correct!

Middle School – Understanding Leads to Action

This self-contained lesson, [Quest for Pollen](#), will guide students in collecting, analyzing, and quantifying pollen on a given day. Use the [National Allergy map](#) to help you schedule this lab for optimum success, and if students do this several times, they can compare their collection rate with the map forecasts. Wind driven pollen is a type of particulate matter that causes health problems in many people, although it is important to note this is a natural phenomenon that has been going on for millions of years.

[Human induced particulate matter](#) is a topic of interest in climate research. Wildfires, soil erosion, nitrogen deposition and vehicle emissions all contribute to higher levels of air particles that have lasting health effects and contribute to

a warming climate. Understanding this issue can lead students to create school-based solutions to reducing the impacts of particulate matter in their neighborhoods.

High School – Botanists and Paleobotanists

PlantingScience has published a comprehensive field and lab exploration of pollen in the atmosphere that is a useful template for learning, even without the mentoring aspect. Students construct traps to collect pollen, refine their microscope lab techniques, conduct pollen counts and analyze results. Students may even try to classify some of the pollen collected! Once students have seen pollen under their microscopes, show them the SEM images of pollen and watch their amazed faces!

Pollen is very useful for forensic scientists and paleobotanists. This Pollen and Paleoclimate Lab simulates the use of ancient pollen data to determine the type of climate that occurred during the same period as the pollen deposition. This is part of a larger section on Trees and Paleoclimate that is well worth examining.

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

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