

Photo Description



This image shows ornamental grasses with feathery, fluffy seed heads covered in tiny water droplets. The grass seeds have long, silky hairs that help them float through the air when the wind blows. You can see how the morning dew has collected on all the fine threads, making them sparkle like tiny crystals.

Scientific Phenomena

The anchoring phenomenon here is seed dispersal by wind adaptation. The ornamental grass has evolved specialized seed structures with feathery plumes (called awns or pappus) that act like tiny parachutes. When mature, these lightweight seeds will catch air currents and travel far from the parent plant to establish new populations. The water droplets visible are dew formation - when warm, moist air cools overnight, water vapor condenses on surfaces, particularly on the many fine surfaces provided by the grass's intricate seed structure.

Core Science Concepts

1. Plant Reproduction and Seed Dispersal - Plants have developed various strategies to spread their seeds away from the parent plant to reduce competition and colonize new areas.
2. Structural Adaptations - The feathery appendages on these seeds are evolutionary adaptations that increase surface area while keeping weight minimal, maximizing wind-carrying potential.
3. Water Cycle Processes - Dew formation demonstrates condensation, where water vapor in the air changes to liquid water when temperatures drop overnight.
4. Surface Area and Physics - The numerous fine filaments create extensive surface area for both seed dispersal efficiency and dew collection.

Pedagogical Tip:

Have students compare different seed types (maple "helicopters," dandelion puffs, acorns) to help them understand that plants solve the same problem (seed dispersal) in different ways. This builds pattern recognition skills.

UDL Suggestions:

Provide tactile experiences by bringing in actual grass seed heads, feathers, cotton balls, and other materials for students to feel and compare. This supports kinesthetic learners and makes abstract concepts concrete.

Zoom In / Zoom Out

Zoom In: At the microscopic level, each seed contains an embryonic plant with stored nutrients, and the feathery structures are made of specialized plant cells with thick walls that provide strength while remaining lightweight. The dew droplets form due to molecular attractions between water molecules and the plant surface.

Zoom Out: This grass is part of a larger grassland ecosystem where wind dispersal helps maintain genetic diversity across populations. The water collected as dew contributes to the local water cycle and may provide moisture for germinating seeds, connecting to watershed systems and regional climate patterns.

Discussion Questions

1. How might the shape and structure of these seed parts help the plant survive in different environments? (Bloom's: Analyze | DOK: 3)
2. What would happen to this grass population if there was no wind for an entire growing season? (Bloom's: Evaluate | DOK: 3)
3. Why do you think dew forms more easily on these feathery grasses than on smooth leaves? (Bloom's: Apply | DOK: 2)
4. What other plants or animals have you observed that use similar strategies to move from place to place? (Bloom's: Apply | DOK: 2)

Potential Student Misconceptions

1. Misconception: "The fluffy parts are just for decoration or to look pretty."
Reality: These structures serve a specific survival function - helping seeds travel to new locations where they can grow without competing with the parent plant.
2. Misconception: "Dew falls from the sky like rain."
Reality: Dew forms when water vapor in the air condenses directly onto cool surfaces, not from water falling from above.
3. Misconception: "All plants spread seeds the same way."
Reality: Plants have evolved many different seed dispersal strategies including wind, water, animals, and explosive mechanisms.

Cross-Curricular Ideas

1. Math - Measuring and Graphing: Have students measure the length of grass seed heads and create bar graphs to compare different grass species. They can also calculate the surface area of feathery structures by estimating how many individual filaments are on each seed head and multiplying by approximate filament length.
2. ELA - Descriptive Writing: Ask students to write detailed descriptions of the grass seed heads using sensory language (what they see, feel, smell). Challenge them to write persuasive paragraphs explaining why they think wind dispersal is an effective strategy compared to other methods, using evidence from the photo.
3. Social Studies - Agricultural Geography: Explore how different grass species are found in different regions around the world based on climate and wind patterns. Students can research which grasses are native to your local area and why those particular species thrive there, connecting to concepts of place and human-environment interaction.
4. Art - Nature Sketching and Texture: Have students create detailed drawings or paintings of the grass seed heads, focusing on capturing the delicate texture and the way light reflects off the water droplets. They can also create mixed-media artwork using actual dried grasses, feathers, and cotton balls to represent different seed dispersal structures.

STEM Career Connection

1. **Botanist (Plant Scientist):** Botanists study how plants grow, reproduce, and adapt to their environments. A botanist might spend time in gardens, forests, or laboratories learning about seeds, flowers, and how plants survive different weather conditions. They help us understand which plants are healthy and which ones need protection. Average Salary: \$65,000 - \$75,000 per year
2. **Agricultural Scientist:** Agricultural scientists work to help farmers grow better crops and protect plants from diseases and pests. They study things like seed quality, soil health, and water management. Some agricultural scientists even develop new varieties of crops that can survive droughts or extreme weather using knowledge about plant adaptation. Average Salary: \$70,000 - \$85,000 per year
3. **Environmental Ecologist:** Environmental ecologists study how plants and animals live together in ecosystems. They use knowledge about seed dispersal and plant reproduction to protect natural habitats and restore damaged ecosystems. They might work in national parks, wetlands, or prairies, studying how wind-dispersed seeds help restore grasslands after fires or other disturbances. Average Salary: \$68,000 - \$80,000 per year

NGSS Connections

- Performance Expectation: 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment
- Disciplinary Core Ideas: 5-LS1.C, 5-ESS2.A, LS1.B
- Crosscutting Concepts: Structure and Function, Patterns

Science Vocabulary

- * **Seed dispersal:** The way plants spread their seeds to new places where they can grow.
- * **Adaptation:** A special feature that helps a living thing survive in its environment.
- * **Condensation:** When water vapor in the air turns into tiny water droplets on surfaces.
- * **Surface area:** The total amount of space on the outside of an object.
- * **Germination:** When a seed begins to grow into a new plant.

External Resources

Children's Books:

- The Reason for a Flower by Ruth Heller
- Seeds Move! by Robin Page
- A Seed Is Sleepy by Dianna Hutts Aston