# Vine

Life Science | Lesson Guide

1st Grade

## Photo Description

This image shows a green vine plant growing up and over a wooden fence. The vine has long, green leaves and thick, smooth pods hanging down. The plant is climbing on the fence by wrapping around it, showing us how some plants grow upward toward the sunlight.

## Scientific Phenomena

Anchoring Phenomenon: Why does this plant grow up the fence instead of along the ground?

Scientific Explanation: This is a climbing vine (likely a legume such as a bean or pea plant) that grows toward sunlight. Plants exhibit a behavior called "positive phototropism"—they naturally grow upward and toward light sources. The vine uses the fence as a support structure, twining its stems around the wood to climb higher. This adaptation allows the plant to reach more sunlight while using less energy to create a supporting structure of its own. The pods visible are seed containers that develop after the plant flowers, representing the plant's reproductive cycle.

## Core Science Concepts

1. Plants need sunlight to grow: Plants grow toward light sources to gather energy for survival. By climbing the fence, this vine reaches more direct sunlight than it would lying on the ground.

2. Plants can grow in different directions: Unlike most plants that grow straight up from roots, some plants (like vines) have adapted to climb and wrap around objects for support.

3. Plant structures serve different purposes: The leaves capture sunlight, the stems climb and support the plant, and the pods protect developing seeds.

4. Living things interact with their environment: This vine uses the fence as a tool to survive, showing how plants adapt to their surroundings.

**Pedagogical Tip:**

When teaching about vines to first graders, use the analogy of the fence as a "helper" for the plant—just like children use chairs to climb safely, the plant uses the fence to reach sunlight. This makes the abstract concept of plant adaptation concrete and relatable to young learners.

**UDL Suggestions:**

Provide multiple means of engagement: Set up a classroom "vine station" where students can physically manipulate flexible pipe cleaners around a wooden frame or chair to simulate how vines climb. This kinesthetic approach supports learners who benefit from tactile experiences. Additionally, offer images, real specimens, and discussion so visual and auditory learners are both engaged with the concept.

## Discussion Questions

1. What do you think would happen to this plant if the fence were not there? (Bloom's: Analyze | DOK: 2)

2. Why does the vine grow up toward the top of the fence instead of staying on the ground? (Bloom's: Understand | DOK: 2)

3. How is this climbing vine different from a plant in a garden pot? (Bloom's: Compare | DOK: 2)

4. What do you think these green pods are used for by the plant? (Bloom's: Infer | DOK: 3)

## Extension Activities

1. Pipe Cleaner Vines: Provide students with green pipe cleaners and a small wooden frame or chair. Have them "plant" the pipe cleaner at the base and guide it to wrap around the frame like a real vine. Discuss why wrapping helps the plant grow taller.

2. Classroom Vine Observation Journal: Plant pole beans or peas in clear cups where students can see the roots. Over 2-3 weeks, have students draw daily observations of how the vine grows, wraps, and changes. Create a class growth chart to track the vine's height.

3. Human Vine Game: Take students outside and have them act like climbing vines. Ask them to "grow" toward a sunny spot on the playground, explaining that they need light just like real plants do. This embodied learning helps them understand plant movement.

## NGSS Connections

Performance Expectation:
1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and animals use their external parts to help them survive, grow, and meet their needs.

Disciplinary Core Ideas:
- 1-LS1.A: All organisms have external parts that they use to perform daily functions.
- 1-LS2.E: Plants get the materials they need for growth chiefly from air and water.

Crosscutting Concepts:
- Structure and Function: The vine's structure (twining stems, flexible growth) serves the function of climbing toward light.
- Cause and Effect: Sunlight causes the vine to grow upward; the fence provides the cause for the vine to wrap and climb.

## Science Vocabulary

* Vine: A plant with a long, thin stem that grows by climbing or trailing along the ground or other objects.
* Climb: To move upward using support, like a vine moving up a fence.
* Sunlight: Light energy from the sun that plants need to grow strong and healthy.
* Pod: A case or container that holds seeds inside it.
* Support: Something that holds something else up or keeps it from falling.

## External Resources

Children's Books:
- The Tiny Seed by Eric Carle – A story about how a tiny seed grows into a beautiful plant, touching on plant life cycles.

- How a Seed Grows by Helene J. Jordan – A simple, clear explanation of plant growth from seed to mature plant.
- From Seed to Plant by Gail Gibbons – Colorful, informative illustrations showing the plant lifecycle.

YouTube Videos:
- "How Do Plants Grow? | Easy Science for Kids" – A 5-minute animated video explaining basic plant growth and needs. https://www.youtube.com/watch?v=KvVrFZDKmRU
- "Climbing Plants and How They Grow" – A nature documentary segment showing real vines growing and climbing structures in slow motion. https://www.youtube.com/watch?v=4nANHWpXovY