

## Photo Description



This image shows a climbing vine plant with large, green leaves and a long, bean-like pod growing along a weathered wooden fence. The vine is using the fence as support, wrapping its stems and tendrils around the wood as it grows upward toward the sunlight. The plant appears to be thriving, with healthy green leaves and visible flowers.

## Scientific Phenomena

**Anchoring Phenomenon:** How do plants grow upward without legs or roots to hold them up?

This image illustrates plant growth and adaptation—specifically, how some plants have developed structures called tendrils and climbing stems to support themselves by attaching to nearby objects. The vine doesn't have the strength to stand alone, so it evolved to use external structures (like fences) as scaffolding. This behavior is called thigmotropism (growth in response to touch). As the vine grows, its tendrils sense contact with the fence, coil around it, and secure the plant upward. This is a survival strategy: by climbing, the plant reaches more sunlight for photosynthesis without using energy to build a thick, woody stem like a tree does.

## Core Science Concepts

- \* **Plant Growth and Life Cycles:** Plants grow by producing new leaves, stems, and sometimes flowers and seeds. This vine is actively growing, showing healthy leaves and a developing pod.
- \* **Plant Structures and Functions:** Different plant parts have different jobs—leaves capture sunlight, stems transport water and nutrients, and tendrils help the plant climb and attach to supports.
- \* **Adaptation and Survival:** This vine has adapted a special climbing strategy to survive by reaching sunlight more efficiently than it could on its own. The coiled tendrils are an adaptation.
- \* **Plant Needs:** Plants need sunlight, water, soil nutrients, and air to grow. By climbing the fence, this vine positions itself to get more direct sunlight.

### Pedagogical Tip:

Second graders are concrete thinkers and learn best through direct observation and hands-on exploration. Rather than explaining photosynthesis abstractly, have students observe a real climbing plant or vine and gently touch the tendrils to feel their texture. Ask them to predict what would happen if you removed the fence—would the plant still stand up? This makes the concept of plant adaptation tangible and memorable.

### UDL Suggestions:

**Multiple Means of Representation:** Provide images, real plant specimens, and videos showing vines in different environments (trellises, trees, walls). This supports visual, kinesthetic, and auditory learners. **Multiple Means of Action & Expression:** Allow students to sketch the vine, manipulate a model vine with string and a pencil (as a "fence"), or act out how a vine climbs. **Multiple Means of Engagement:** Connect to students' interests—do they have plants at home? Have they seen ivy on a house?

## Discussion Questions

\* "Why do you think this plant is growing up the fence instead of spreading out flat on the ground?" (Bloom's: Analyze | DOK: 2)

Students consider cause-and-effect reasoning and observe how the plant's structure supports its growth direction.

\* "What would happen to this vine if the fence were not there?" (Bloom's: Evaluate | DOK: 3)

Students use evidence from the image to predict outcomes and justify their reasoning.

\* "How are the twisted tendrils like your hand wrapping around a rope?" (Bloom's: Understand | DOK: 1)

Students make personal connections to plant structures and recognize analogies.

\* "What does this plant need to keep growing healthy and strong?" (Bloom's: Remember | DOK: 1)

Students identify basic plant needs: water, sunlight, soil, and air.

## Extension Activities

\* Grow Your Own Climbing Plant: Plant bean or pea seeds in small pots and provide a stick or pencil "trellis." Over weeks, observe and sketch how the vine grows, where tendrils form, and how they attach. Students can measure vine height weekly and create a growth chart.

\* Build a Vine Obstacle Course: Create a tabletop "fence" using craft sticks, straws, and pipe cleaners taped together. Give students string or yarn to represent a vine and challenge them to "climb" it around the obstacles in different ways. This helps them understand why tendrils spiral and adapt their grip.

\* Sensory Exploration Station: Set up a station with real plant samples (if safe and available), magnifying glasses, and textured materials (rough fabric, smooth plastic, ridged surfaces). Students observe how tendrils might "prefer" certain textures for gripping and discuss what they notice.

## NGSS Connections

Performance Expectation:

2-LS2-1: Plan and conduct investigations to provide evidence that plants get the materials they need for growth chiefly from air and water.

Relevant Disciplinary Core Ideas:

- 2-LS2.A Interdependent Relationships in Ecosystems
- 1-LS1.A Structure and Function

Crosscutting Concepts:

- Structure and Function
- Cause and Effect

## Science Vocabulary

\* Vine: A plant with a long, thin stem that grows along the ground or climbs up things for support.

\* Tendril: A thin, twisty part of a plant that wraps around things like fences or sticks to help the plant climb.

\* Adapt or Adaptation: The way a plant or animal changes its body or behavior to survive better in its environment.

\* Support: Something that holds something else up and keeps it from falling.

\* Pod: A long, green case on some plants that holds seeds inside, like the one visible on this vine.

### External Resources

Children's Books:

- Up, Up, Up in the Trees by Marianne Berkes (explores plant growth and forest layers)
- The Tiny Seed by Eric Carle (follows a seed's journey and growth process)
- How Do Plants Grow? by Gail Gibbons (nonfiction with clear illustrations of plant structures)

YouTube Videos:

- "How Do Plants Grow? | Plant Growth for Kids" by Kids Learning Tube (2:30 min) — Clear explanation of plant needs and growth stages with visuals suitable for second grade. <https://www.youtube.com/watch?v=4yqBCDtvqpA>
- "Time Lapse: Climbing Beans Growing" by BBC Learning (3:00 min) — Mesmerizing real footage of climbing beans attaching to a trellis, visually demonstrates tendrils and upward growth. [https://www.youtube.com/watch?v=xwcgw\\_gOKYs](https://www.youtube.com/watch?v=xwcgw_gOKYs)