

## Photo Description



This flower shows two different colors on the same plant—bright pink petals on the outside and a yellow center with dark red stamens. The flower is surrounded by green leaves and other smaller flowers in a garden. Scientists can see how flowers come in many different colors, shapes, and patterns, even when they are the same type of plant!

## Scientific Phenomena

**Anchoring Phenomenon:** Why does this flower have two different colors?

This flower displays natural variation in traits—a foundational concept in heredity and genetics. The pink petals and yellow center with burgundy stamens are predetermined by the plant's genes (the instructions that tell a plant what to look like). Different parts of the flower receive different genetic instructions, just like how some people have brown eyes and others have blue eyes. This is not a mutation in the traditional sense, but rather an example of distinct coloration patterns that are normal and intentional in this flower variety. The color difference helps attract pollinators (like bees and insects) to the flower so they can help the plant make seeds.

## Core Science Concepts

1. **Traits and Variation:** Living things have different characteristics (traits) like color, size, and shape. No two flowers are exactly alike, even on the same plant.
2. **Plant Parts Have Different Functions:** Different parts of a flower have different jobs. The colorful petals attract insects, while the yellow center (stamens and pistil) are the parts that make seeds.
3. **Patterns in Nature:** Flowers often have patterns—like this one with pink outer petals and a yellow center. These patterns help us identify and classify plants.
4. **Adaptation and Survival:** Bright colors help flowers attract pollinators (insects and other animals) that help the plant reproduce and survive.

### Pedagogical Tip:

For First Grade learners, use the "Notice, Wonder, Investigate" routine. Start by asking students what they NOTICE about the flower (colors, shapes, parts), then what they WONDER about it (Why is it pink AND yellow? Who visits this flower?). This builds observational skills before diving into explanations. Avoid heavy genetics terminology; instead use simple words like "instructions" or "plant recipes."

### UDL Suggestions:

**Multiple Means of Representation:** Provide close-up photos, a real flower (if possible), and a simple diagram with labels. Some students may learn better by touching real petals or examining the flower with a magnifying glass.

**Multiple Means of Action & Expression:** Allow students to draw the flower, use colored blocks to show the pattern, or sort flower pictures by color rather than requiring only one type of response.

**Multiple Means of Engagement:** Connect to student interests: "Do you like pink or yellow better? Why do you think this flower has BOTH colors?"

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## Zoom In / Zoom Out

### Zoom In: Inside the Flower (Microscopic Level)

If we could shrink down to the size of a tiny ant and look inside this flower, we would see millions of cells working together. The pink petals have special cells that make the pink color (like tiny paint factories!). The yellow center has different cells that make yellow color. Even though we can't see these cells without a special microscope, they are all following the plant's "instructions" (genes) to make the right color in the right place. Pollen grains, which are smaller than a grain of sand, sit on the yellow stamens waiting for a bee to pick them up!

### Zoom Out: The Garden Ecosystem (Community Level)

This single flower is part of a much bigger picture—a whole garden community! The pink and yellow flower is a "restaurant" and "home" for many living things: bees come to eat pollen and drink nectar, butterflies land on the petals, and tiny insects crawl on the stems. Birds might eat those insects. When bees carry pollen from flower to flower, they help make new plants grow. The garden soil feeds the roots, rain waters the plant, and the sun gives it energy. This one flower is connected to insects, soil, water, air, and animals all around it. Everything in nature is connected!

## Discussion Questions

1. What colors do you see on this flower, and where are they? (Bloom's: Remember | DOK: 1)
2. Why do you think this flower might have a bright yellow center in the middle? (Bloom's: Analyze | DOK: 2)
3. If a bee visits this flower, what do you think it might be looking for? (Bloom's: Infer | DOK: 2)
4. Look at other flowers in the garden. What do they have in common with this pink flower, and how are they different? (Bloom's: Compare | DOK: 3)

## Potential Student Misconceptions

Misconception 1: "The flower painted itself two colors."

Clarification: The flower didn't paint itself—the colors grew that way because of the plant's special instructions inside its seeds (genes). It's like a recipe that says "make pink petals" and "make a yellow center." The plant followed its recipe perfectly!

Misconception 2: "All flowers with the same name should look exactly the same."

Clarification: Even though many flowers are called "zinnias," they can look a little different from each other—some might be darker pink, lighter pink, or have bigger petals. This is called variation, and it's normal and healthy. Just like all kids have two eyes, but everyone's eyes look a little different!

Misconception 3: "The yellow part is just for decoration, like the pink."

Clarification: The yellow center isn't just pretty—it has an important job! The yellow stamens hold pollen, and the center parts help make seeds. The bright colors and the important job work together. The pretty colors bring the pollinators, and the pollinators help with the important job of making new flowers!

## Extension Activities

1. Flower Color Sorting Walk: Take students on a nature walk or show pictures of flowers in different colors. Have them sort by color into groups, then count which color appears most often. This builds observation and data skills.

2. Design Your Own Flower: Provide colored paper, markers, and craft supplies. Ask students to create their own flower with two or more colors, just like the zinnia in the photo. Have them explain why they chose those colors and where they put them.
3. Pollinator Hunt: Place the flower photo in the classroom. Over several days, ask students to find and draw or collect pictures of insects (real or from magazines) that might visit this flower. Create a class chart: "What visits our flower?"

### Cross-Curricular Ideas

#### Math Connection: Counting & Patterns

Have students count the petals on the flower and on other flowers in the photo. Create a bar graph showing "How many pink petals?" vs. "How many petals on other flowers?" Students can also find and extend color patterns: "Pink, Yellow, Pink, Yellow—what comes next?"

#### ELA Connection: Descriptive Writing & Storytelling

Ask students to write or dictate 2-3 sentences describing the flower using colorful words: "This flower is bright pink with a sunny yellow center." Or create a story from the flower's perspective: "I am a pink flower. A bee came to visit me today because..." This builds vocabulary and narrative skills while reinforcing science observations.

#### Art Connection: Mixed-Media Flower Creation

Students can recreate this flower using torn colored paper, paint, markers, or natural materials (flower petals, leaves, seeds if available). Display their creations and compare: "Whose flower is the brightest? Whose has the most petals? What colors did you choose and why?" This reinforces color recognition and allows creative expression.

#### Social Studies Connection: Community Gardens & Plant Care

Discuss how plants grow in gardens and need care from people. If your school has a garden, take students to observe flowers and care for them (water, pull weeds). Talk about how communities work together to grow food and flowers, just like how bees and flowers work together. This builds environmental stewardship and community awareness.

### STEM Career Connection

#### Botanist (Plant Scientist)

A botanist is a scientist who studies plants—how they grow, what colors they are, and how they survive. Botanists visit gardens and forests to observe flowers like this zinnia, draw pictures of them, and learn why they have different colors. Some botanists work to create new flower colors or help sick plants get healthy! A botanist might work in a garden, a museum, or a laboratory.

Average Annual Salary: \$65,000 USD

#### Beekeeper / Pollinator Expert

A beekeeper takes care of honeybees and other pollinators that visit flowers. They learn which flowers bees like best (like this pink zinnia!), help bees stay healthy, and collect honey. Pollinator experts also teach people why bees are important and help protect them. This job requires loving insects and understanding how plants and animals help each other.

Average Annual Salary: \$60,000 USD

#### Florist / Horticulturist

A florist or horticulturist grows flowers and plants and arranges them to make beautiful displays for gardens, homes, and events. They know the names of hundreds of flowers, understand what colors go well together, and know how to keep flowers healthy and alive for a long time. This job mixes science with art and creativity!

Average Annual Salary: \$58,000 USD

## NGSS Connections

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

Disciplinary Core Ideas:

- 1-LS1.A - Structure and Function (flower parts help with pollination)
- 1-LS3.A - Inheritance of Traits (organisms have traits; some traits are passed down)

Crosscutting Concepts:

- Patterns - Colors and shapes follow patterns in nature
- Structure and Function - Different flower parts have different purposes

## Science Vocabulary

- \* Trait: A characteristic or feature of a living thing, like its color, size, or shape.
- \* Petals: The colorful leaf-like parts of a flower that we see first.
- \* Stamens: The yellow parts in the center of a flower that make pollen.
- \* Pollinator: An animal (like a bee or butterfly) that carries pollen from flower to flower to help plants make seeds.
- \* Variation: Differences between living things, even when they are the same kind.
- \* Pattern: A repeated design or arrangement of colors, shapes, or parts.

## External Resources

Children's Books:

- Flowers by Loretta Holland (National Geographic Little Kids)
- The Tiny Seed by Eric Carle
- From Seed to Plant by Gail Gibbons

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Teacher Notes: This lesson emphasizes observable traits and natural variation—the foundation for later genetics learning. Use the flower as a real-world anchor to make abstract ideas concrete. Encourage curiosity and observation above memorization at this grade level!