EXPLORATION 4

How Plants Change

Activity Guide, pages 39-40

TIME ESTIMATE

30 min

INVESTIGATIVE PHENOMENON
Plants react to their environments.

Phenomenon Explained Students explore the **investigative phenomenon** by investigating how plants react and move in response to their environments. They also use evidence gathered to support their claim about why trees make fruit.

Seasonal Changes

Everyday Phenomenon **Some trees drop their leaves in the fall.**

Use the images in this Exploration to discuss the **everyday phenomenon** of seasonal changes, and guide students in connecting it to the **anchoring phenomenon** that plants have structures that change through the seasons. Ask students if they have noticed differences in how trees look from one season to the next. Have students discuss their answers. If you live in a climate that lacks distinct seasons, ask students why the trees that live there might not change dramatically in appearance.

Students infer factors that cause a tree to lose its leaves. **Sample answer:** Fewer hours of daylight might cause a tree to drop its leaves.

SOCIAL EMOTIONAL LEARNING

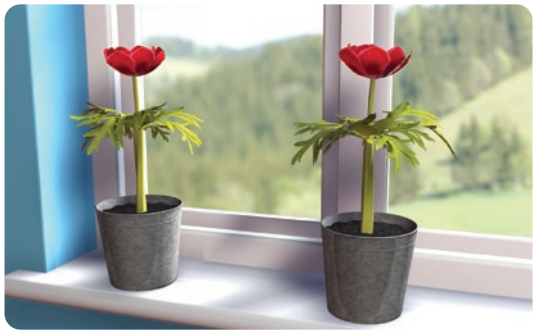
Have students work together in small groups to brainstorm ideas to answer the question. Encourage students to listen respectfully to others even when their opinions or ideas differ.

How Do You Grow?

Students learn about and predict how plants respond to light and gravity.

Response to light: students should circle image a

Response to gravity: students should circle image b



Everyday Phenomenon **A plant's structures help it survive.**

Use the images in this Exploration to discuss the **everyday phenomenon** of plant structures and survival, and guide students in connecting it to the **anchoring phenomenon** that plants have structures that change through the seasons.

Remind students that the parts of a plant's system work together to help it survive.

Ask: How do a plant's movements help it survive? Sample answer: Roots move toward a water source and leaves move toward a light source so the plant can produce food.

Materials Alert Encourage students to use free online resources to find additional evidence of plants responding to light and gravity. Suggest they search "free slow motion (or time-lapse) phototropism" and "free slow motion geotropism."

FORMATIVE ASSESSMENT

MAKING SENSE OF PHENOMENA

Students gain understanding that plants react to their environments as they explore the **investigative phenomenon.** They should connect this to the **anchoring phenomenon** that plants have structures that change through the seasons. Students should understand that trees only have fruit at certain times of the year because they need certain conditions such as day length and temperature to flower and make fruit.

REMEDIATION If students struggle to connect the **investigative phenomenon** back to the **anchoring phenomenon,** have a class discussion about seasonal changes students have observed in your local area and in local plants.

MAKING SENSE OF PHENOMENA IDEA ORGANIZER

After completing Exploration 4, students can fill in the **Idea Organizer** to summarize the connection between plants reacting to their environments and the anchoring phenomenon that plants have structures that change through the seasons.