Plant Pattern Lab

Compare visible structures across living specimens.

BOT.1.10 "Identify and compare various live plant examples to explore plant morphological diversity, including leaf number, structure, and arrangement; root modifications; and flower structure and arrangement. Produce a visual product (e.g...."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Part 1, READ AND MARK: Underline one leaf trait and circle one root trait for each plant. Then number the three plants' flower arrangements 1, 2, and 3 so you can compare the specimens.

Three Plants, Three Patterns

1. On a lab bench, a carrot plant, a sweet potato vine, and a sunflower offer three ways to build a plant. Count leaflets, not just leaves: a carrot leaf is compound, divided into many small segments, while a sweet potato leaf is usually a single heart-shaped blade. A sunflower leaf is also a single blade, often broad and rough. Sweet potato leaves grow one at a time at alternating points along the stem. On a sunflower, lower leaves may form opposite pairs, while higher leaves are often alternate. Carrot leaves cluster near the soil in a basal rosette.

2. Lift the plants carefully to see what lies below the soil. A carrot stores food in a thickened taproot that bears smaller side roots. Sweet potatoes form swollen storage roots from roots that grow from stem nodes. These are roots, not stem tubers like potatoes. A sunflower usually has a main taproot with branching side roots, but it is not enlarged for food storage like the carrot's. These differences show why the word "root" alone cannot fully describe a specimen. The location and shape of a swollen part help you identify which structure has changed.

3. Look closely at the blooms before calling every colorful cluster one flower. A sunflower head holds many small flowers, or florets: ray florets ring the edge, and disk florets fill the center. Carrot plants carry many tiny flowers in umbrella-shaped clusters called umbels. A sweet potato flower has a single funnel-shaped corolla, and its flowers may appear alone or in small groups near leaves. Both carrot umbels and sunflower heads group many flowers, but their shapes and individual flowers differ. Comparing leaves, roots, and blooms together gives a fuller picture than sorting plants by one feature.

2 ANSWER WITH EVIDENCE

Use the passage

1. Part 2, QUESTIONS: How does the structure of a carrot leaf differ from that of a sweet potato leaf?

2. How does leaf placement on a sweet potato vine compare with leaf placement on a sunflower?

3. Both carrots and sweet potatoes store food belowground. How do their storage roots differ?

4. How are a carrot umbel and a sunflower head alike, and how are they different?

3 YOUR TURN

Your own words

Part 3, YOUR TURN: Observe two live flowering plants with visible roots provided in class. Make a comparison chart showing each plant's leaf form and placement, root traits, and flower form and grouping; use the last row to show one similarity and one difference you observed.

SPECIMEN OR PATTERN	LEAVES: FORM AND PLACEMENT	ROOTS: SHAPE OR MODIFICATION	FLOWERS: FORM AND GROUPING

Plant Pattern Lab

PART 1 · READ AND MARK

Part 1, READ AND MARK: Underline one leaf trait and circle one root trait for each plant. Then number the three plants' flower arrangements 1, 2, and 3 so you can compare the specimens. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Part 2, QUESTIONS: How does the structure of a carrot leaf differ from that of a sweet potato leaf?	**A carrot leaf is compound and divided into many segments; a sweet potato leaf is usually one heart-shaped blade.**
2	How does leaf placement on a sweet potato vine compare with leaf placement on a sunflower?	**Sweet potato leaves alternate along the stem. Sunflower leaves may be opposite in lower pairs and alternate higher up.**
3	Both carrots and sweet potatoes store food belowground. How do their storage roots differ?	**A carrot stores food in a thickened taproot. A sweet potato stores food in swollen roots that grow from stem nodes.**
4	How are a carrot umbel and a sunflower head alike, and how are they different?	**Both group many flowers. A carrot umbel is umbrella-shaped and holds tiny flowers; a sunflower head has ray florets around disk florets.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

SPECIMEN OR PATTERN	LEAVES: FORM AND PLACEMENT	ROOTS: SHAPE OR MODIFICATION	FLOWERS: FORM AND GROUPING
French marigold	Divided leaves with many leaflets; opposite pairs	Many thin, branching roots	Head with ray and disk florets
Red clover	Leaves with three leaflets; alternate	Taproot with side roots	Rounded head of small, pea-shaped flowers
Comparison	Both have compound leaves, but their leaflets and placement differ	Clover has a taproot; marigold has many thin roots	Both group small flowers into heads, but the flowers differ in form

Accept accurate observations of the two specimens supplied, including differences from the sample plants. The comparison row should state at least one supported similarity and one supported difference.