Trail Plant Detective

Compare plant structures, then follow a key to identify species.

BOT.1.11 "Compare and contrast functions of the various characteristics found in plant divisions and utilize dichotomous keys to identify plant species."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline every mention of spores and circle every mention of seeds. Number the three pairs of choices in the key to show how those traits help separate the plants.

Four Plants Along a Trail

1. On a damp trail, common haircap moss (Polytrichum commune) forms small green tufts. It has no true vascular tissue, so water moves only short distances through and across its tissues. Rhizoids anchor it, while spores develop in capsules raised on stalks. Nearby, bracken fern (Pteridium aquilinum) spreads broad fronds above an underground stem. Its vascular tissue moves water and sugars through the plant, supporting larger growth. Bracken also reproduces by spores, which form in clusters along the edges of fertile fronds. Both plants need water for sperm to swim to eggs during fertilization.

2. Farther uphill, eastern white pine (Pinus strobus) has needles grouped in bundles of five. Its vascular tissue carries water and sugars, as in the fern, but it produces seeds instead of spores. Pollen carries sperm to the ovule without free water for swimming, and a cone holds seeds that are not enclosed in fruit. At the field's edge, common sunflower (Helianthus annuus) also has vascular tissue, pollen, and seeds. Its showy flower head contains many tiny flowers. After fertilization, each fertile flower can form a dry fruit containing one seed. Flowers and fruits distinguish it from pine.

3. A dichotomous key offers two choices at each step. Start with the structure that disperses offspring: spores or seeds. If the plant produces spores, check for true vascular tissue. Without it, the trail plant is common haircap moss; with it, the plant is bracken fern. If the plant produces seeds, check whether they are enclosed in fruits. Seeds not enclosed in fruits lead to eastern white pine; seeds enclosed in fruits lead to common sunflower. Leaf size or growing place can be misleading, but these paired choices connect reproductive structures to a plant's identity.

2 ANSWER WITH EVIDENCE

Use the passage

1. Haircap moss and bracken fern both produce spores. How does vascular tissue differ between them, and what does that tissue support in bracken?

2. How are pine and sunflower alike in reproduction, and how does the location of their seeds differ?

3. A plant produces seeds enclosed in dry fruits. Follow the passage's key: which species does it identify, and which two choices lead there?

4. A plant produces spores and has true vascular tissue. Follow the key to identify it, then explain why it is not haircap moss.

3 YOUR TURN

Your own words

Write a field note for a new mystery plant that matches eastern white pine. Give two observable traits, trace your choices through the passage's key, and compare what its cone holds with what haircap moss capsules hold.

ANSWER KEY

Trail Plant Detective

HIGH SCHOOL · BOT.1.11

PART 1 · READ AND MARK

Underline every mention of spores and circle every mention of seeds. Number the three pairs of choices in the key to show how those traits help separate the plants. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Haircap moss and bracken fern both produce spores. How does vascular tissue differ between them, and what does that tissue support in bracken?	**Haircap moss lacks true vascular tissue. Bracken has vascular tissue that transports water and sugars and supports larger growth.**
2	How are pine and sunflower alike in reproduction, and how does the location of their seeds differ?	**Both use pollen and produce seeds. Pine seeds are not enclosed in fruit; sunflower seeds are enclosed in dry fruits.**
3	A plant produces seeds enclosed in dry fruits. Follow the passage's key: which species does it identify, and which two choices lead there?	**Common sunflower. Choose seeds, then seeds enclosed in fruits.**
4	A plant produces spores and has true vascular tissue. Follow the key to identify it, then explain why it is not haircap moss.	**Bracken fern. Haircap moss also produces spores, but it lacks true vascular tissue.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

My mystery plant has needles in bundles of five and cones with seeds that are not enclosed in fruit. I choose seeds, then seeds not enclosed in fruits, so the key identifies eastern white pine. Its cone holds seeds, while haircap moss capsules hold spores.

For the field note, accept other observable pine traits from the passage if the route uses seeds and seeds not enclosed in fruits. The comparison must correctly distinguish seeds in cones from spores in moss capsules.