# Plant Science

Use this key to check answers and read the explanations.

1. Fine root hairs make contact with soil. How do they help a plant take in water and dissolved minerals?

A. They increase the root’s surface area.
B. They move flowers above the soil.
C. They carry pollen to the roots.
D. They store most of the plant’s seeds.

Correct answer: A. They increase the root’s surface area.
Root hairs extend from surface cells and increase contact with the surrounding soil.

2. Which part of a typical flowering plant holds leaves above the ground and connects them to the roots?

A. Seed coat
B. Petal
C. Stem
D. Root cap

Correct answer: C. Stem
Stems support leaves and other shoot parts. They also contain tissues that connect the roots and shoots.

3. Which structure on a twig contains a young shoot or flower that can open later?

A. Root hair
B. Bud
C. Petiole
D. Fruit wall

Correct answer: B. Bud
A bud encloses developing parts of a shoot or flower. It can remain dormant until it resumes growth.

4. What are the usually leaflike structures that surround and protect many unopened flower buds?

A. Ovules
B. Anthers
C. Stigmas
D. Sepals

Correct answer: D. Sepals
The sepals typically enclose the inner flower parts before the flower opens.

5. Which structure protects the growing tip of a root as it moves through soil?

A. Petiole
B. Root cap
C. Stigma
D. Seed leaf

Correct answer: B. Root cap
The root cap covers the growing tip, where new cells are produced.

6. Plant A has one thick main root with smaller branching roots. Plant B has many similarly sized roots spreading from its base. Which is the taproot system?

A. Plant A
B. Plant B
C. Both plants
D. Neither plant

Correct answer: A. Plant A
A taproot system has a prominent main root. Plant B describes a fibrous root system.

7. A bee carries pollen from one flower to the receptive surface of a second flower of the same species. What is this transfer called?

A. Seed dispersal
B. Germination
C. Transpiration
D. Pollination

Correct answer: D. Pollination
Pollination transfers pollen to a receptive structure. Fertilization is a later event involving the joining of gametes.

8. After fertilization in a typical flowering plant, which structure usually develops to form the fruit surrounding the seeds?

A. Petal
B. Anther
C. Ovary
D. Stigma

Correct answer: C. Ovary
The ovary matures into a fruit in many flowering plants. Its ovules develop into seeds.

9. A strawberry plant sends a horizontal stem along the ground, and a plantlet forms where it touches soil. What kind of stem is the runner?

A. Stolon
B. Taproot
C. Petiole
D. Anther

Correct answer: A. Stolon
A stolon runs along the surface and can produce shoots and roots at its nodes.

10. Clusters on the underside of a fertile fern frond contain structures that release what?

A. Seeds
B. Pollen grains
C. Fruits
D. Spores

Correct answer: D. Spores
Many ferns form clusters of spore-producing structures on their fronds.

11. Two seedlings have light available only from the right. Their shoots gradually bend toward that light. Which response is shown?

A. Positive gravitropism
B. Negative phototropism
C. Positive phototropism
D. Seed dormancy

Correct answer: C. Positive phototropism
Positive phototropism is growth toward a light source.

12. A young plant is turned on its side in darkness. Its new roots curve downward. Which response is most directly demonstrated?

A. Negative gravitropism
B. Positive gravitropism
C. Positive phototropism
D. A response to touch alone

Correct answer: B. Positive gravitropism
New root growth follows the direction of gravity. Darkness removes directional light as the explanation in this setup.

13. In a classroom seed trial, 18 of 24 seeds sprout in tray A and 15 of 20 sprout in tray B. How do the sprouting percentages compare?

A. Tray A is 90 percent and tray B is 75 percent.
B. Tray A is 80 percent and tray B is 75 percent.
C. Tray A is 75 percent and tray B is 60 percent.
D. Both are 75 percent.

Correct answer: D. Both are 75 percent.
Divide the number that sprouted by the starting total for each tray. Both 18 over 24 and 15 over 20 equal 0.75.

14. A student takes two stem cuttings. One includes a node with a visible bud. The other comes entirely from the space between nodes. Which feature gives the first cutting a ready site for shoot growth?

A. An existing axillary bud at the node
B. A mature fruit inside the stem
C. A root cap at the cut surface
D. An anther buried in the stem

Correct answer: A. An existing axillary bud at the node
Nodes are places where leaves attach and axillary buds may develop. An existing bud can grow into a shoot.

15. In a temperate tree that normally produces one growth ring per year, what does an unusually narrow ring show directly?

A. The species of every plant that grew nearby
B. Exactly how much rain fell in that year
C. Less radial wood growth in that year
D. The tree’s exact height in that year

Correct answer: C. Less radial wood growth in that year
Ring width measures how much wood was added outward during the interval. Other observations are needed to isolate the cause.