



Unit 3 • Organisms and their Structure: parts of a plant

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. root hairs → e. fine hairs near a root's tip that absorb water and salts K • 4
2. node → g. a joint on a stem from which leaves and branches grow
3. stomata → b. tiny pores on a leaf through which gases pass in and out
4. transpiration → h. the loss of water as vapor from the leaves
5. pollination → a. pollen grains reaching the stigma
6. pericarp → c. the wall of a fruit, which protects the seeds
7. radicle → i. the part of the embryo that grows into the root
8. parasite → d. a living thing that takes its food from another living thing

Each carries 0.5 mark.

2 Multiple choice

- i. b. to absorb water and salts from the soil and send them up into the stem K • 1
The root **absorbs** water and salts from the soil and passes them up into the stem (and it holds the plant in the soil). It is the **stem** that carries them on up to the leaves and carries food to every part. Only some roots, like carrot, store food.
- ii. b. potato U • 1
A **potato** is a stem changed into a food store (a tuber): it has eyes, which are nodes with buds. Sweet potato and carrot are roots. Sugarcane is a stem too, but an ordinary, upright one.
- iii. c. 1, 4, 6 U • 1
The **stamen** (1) is the male part; its **anther** (4) makes the **pollen grains** (6). The ovary, stigma, pistil and ovule are female parts; the sepal and petal are neither.
- iv. c. to get nutrients from insects A • 1
Catching, covering and killing the insect are all steps. The **purpose** of the change is to **get nutrients** (especially nitrogen) from the insects, which the plant can't get enough of from the poor soil where it grows.
- v. d. pollination K • 1
The order is: **pollination** (pollen reaches the stigma), then fertilization (in the ovule), then the ovule becomes a seed and the ovary a fruit.

3 Label the diagram

- | | | |
|-------------|-----------|-------|
| 1. petal | 5. stigma | K • 4 |
| 2. anther | 6. style | |
| 3. filament | 7. ovary | |
| 4. sepal | 8. ovule | |

Each carries 0.5 mark.

4 Very short answers

- a. MARKING SCHEME K • 1
✓ The leaf.
- b. MARKING SCHEME K • 1
✓ Chlorophyll.



- c. MARKING SCHEME K · 1
✓ The ovule.
- d. MARKING SCHEME U · 1
✓ A taproot (one main root with branches).

5 Short answers

- a. MARKING SCHEME K · 2
✓ Any one job, e.g. makes food by photosynthesis.
✓ Any second job, e.g. lets gases and water vapor in and out through its stomata (or stores water, protects the plant as spines, grows new plants).
- b. MARKING SCHEME U · 2
✓ i. Roots (a sweet potato has no nodes or buds).
✓ ii. Stems (a potato's eyes are nodes with buds).
- c. MARKING SCHEME U · 2
✓ Any one difference, e.g. a monocot has one cotyledon in its seed, a dicot two.
✓ Any second difference, e.g. a monocot has fibrous roots and parallel veins; a dicot a taproot and a net of veins.
- d. MARKING SCHEME U · 2
✓ Both have nodes with buds (the eyes of a potato are nodes).
✓ Only stems have nodes and buds; roots never do.
- e. MARKING SCHEME A · 2
✓ A spine has a very small surface (few stomata), so the plant loses very little water by transpiration in a dry place.
✓ The sharp spines keep animals from eating the plant.

6 Long answer

ANSWER

U · 4

- It holds up the leaves, flowers and fruits.
- It carries water and salts from the roots up to the leaves.
- It carries the food made in the leaves to every part of the plant.
- Some stems store food (potato, ginger, taro).
- Green stems make food where there are no proper leaves (cactus).
- New plants grow from the stems of some plants (sugarcane, rose).

MARKING SCHEME

- ✓ Holds up the leaves, flowers and fruits.
- ✓ Carries water and salts from the roots up to the leaves.
- ✓ Carries the food made in the leaves to every part of the plant.
- ✓ Any one more, e.g. some stems store food (potato, ginger), green stems make food (cactus), or new plants grow from stems (sugarcane, rose).

7 Think

ANSWER

HA · 2

No. The stilt roots grow out of the maize stalk above the ground and slant into the soil to hold the tall plant up against the wind. A carrot's root is swollen with food: its job is to store food.

MARKING SCHEME

- ✓ No: maize's stilt roots hold the plant up (support).
- ✓ A carrot's root stores food.



8 Activity: Inside a maize grain and a gram seed (Activity 3.7)

(not marked)

WHAT STUDENTS SHOULD FIND

Gram splits easily into two fat halves: two cotyledons, little or no endosperm, a dicot. Maize doesn't split: one thin cotyledon beside the embryo and a large starchy endosperm, a monocot. The radicle grows into the root and the plumule into the shoot.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	15	13	3	2	33





Unit 3 • Organisms and their Structure: invertebrates and the cell

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. invertebrates
2. Protozoa
3. Porifera
4. Annelida
5. Echinodermata
6. functional
7. nucleus
8. suicide bag

K • 4

Each carries 0.5 mark.

2 Label the diagram

- | | |
|------------------|--------------------------|
| 1. cell wall | 5. mitochondrion |
| 2. cell membrane | 6. vacuole |
| 3. centrosome | 7. lysosome |
| 4. nucleus | 8. plastid (chloroplast) |

K • 4

Each carries 0.5 mark.

3 Multiple choice

- i. d. Mollusca

K • 1

A snail has a soft body, a muscular foot and a shell: **Mollusca**.

- ii. b. Ascaris

U • 1

Ascaris is round, unsegmented, a parasite in the intestine, with separate males and females. A leech is segmented; a tapeworm is flat and hermaphrodite; a slug is a mollusk.

- iii. d. segmented (jointed) legs

U • 1

The prawn is an arthropod, and the mark of every arthropod is **jointed legs**. Not all arthropods have wings or live in water, and an earthworm has a segmented body too.

- iv. a. cell membrane

K • 1

The **cell membrane** lets some substances through and not others. The cell wall is fully permeable.

- v. b. it has a cell wall, a cell membrane, plastids and a vacuole

A • 1

A plant cell has a **cell wall**, **cell membrane**, **plastids** and a **large vacuole**. The other options each include a centrosome, which a plant cell (of a flowering plant) does not have.

4 Very short answers

- a. MARKING SCHEME

K • 1

✓ Mitochondrion (mitochondria).

- b. MARKING SCHEME

K • 1

✓ Coelenterata.

- c. MARKING SCHEME

K • 1

✓ Cellulose.



d. MARKING SCHEME

U • 1

- ✓ Ribosomes.

5 Short answers

a. MARKING SCHEME

U • 2

- ✓ It has jointed legs (three pairs).
- ✓ Any one more feature, e.g. a hard exoskeleton, compound eyes, or a body in segments.

b. MARKING SCHEME

U • 2

- ✓ Similarity, e.g. most of both are parasites (neither has segments).
- ✓ Difference, e.g. a flatworm's body is flat with no anus; a roundworm's is round with a mouth and an anus (or flatworms are hermaphrodite, roundworms have separate sexes).

c. MARKING SCHEME

U • 2

- ✓ Any one difference, e.g. the cell membrane is in both plant and animal cells; the cell wall only in plant cells.
- ✓ Any second difference, e.g. the membrane is thin, flexible, living and semi-permeable; the wall is thick, stiff, non-living, made of cellulose and permeable.

d. MARKING SCHEME

U • 2

- ✓ The mitochondrion.
- ✓ It carries out respiration: it breaks down food using oxygen and releases the energy the cell uses.

e. MARKING SCHEME

A • 2

- ✓ The earthworm's body is in segments (with setae, both sexes in one animal): Annelida.
- ✓ Ascaris's body is not segmented, covered with a cuticle, a parasite with separate sexes: Nematelminthes.

6 Long answer

ANSWER

U • 4

Animal cell	Plant cell
no cell wall; only a cell membrane	a cell wall outside the cell membrane
irregular shape, which can change	fixed, regular shape
no plastids	plastids (chloroplasts and others)
small vacuoles, or none	one large vacuole
has a centrosome and lysosomes	no centrosome (in flowering plants)
nucleus usually near the center	nucleus pushed to one side by the vacuole

MARKING SCHEME

- ✓ An animal cell has no cell wall, only a membrane; a plant cell has a cell wall outside its membrane.
- ✓ An animal cell has an irregular shape; a plant cell a fixed, regular shape.
- ✓ An animal cell has no plastids; a plant cell has plastids (chloroplasts).
- ✓ Any one more, e.g. small vacuoles or none against one large vacuole, or a centrosome and lysosomes only in the animal cell.



7 Think

ANSWER

HA - 2

The chloroplasts. Their chlorophyll traps sunlight, and the plant makes food from carbon dioxide and water, giving out oxygen. So plants take carbon dioxide out of the air and put oxygen back, which animals and people breathe.

MARKING SCHEME

- ✓ The chloroplasts (with chlorophyll).
- ✓ In photosynthesis they take in carbon dioxide and give out oxygen, which animals breathe.

8 Activity: Cheek cells and onion cells (Activities 3.18 and 3.19)

(not marked)

WHAT STUDENTS SHOULD FIND

Cheek cells: flat, irregular, lying singly or in small groups; no cell wall, only a thin membrane; a dark nucleus near the middle; no large vacuole: animal cells. Onion cells: long, many-sided, packed like bricks; a thick, clear cell wall; the nucleus often near the edge; a large vacuole in the middle: plant cells. The onion cells have a fixed shape because of their thick, stiff cell wall.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	13	15	3	2	33

