



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. observation
2. hypothesis
3. test
4. research
5. survey
6. questionnaire
7. fume cupboard
8. control

K • 4

Each carries 0.5 mark.

2 Label the diagram

- | | |
|--------------------------------|---------------------|
| 1. sporangium (full of spores) | 4. spores escaping |
| 2. stolon | 5. rhizoids |
| 3. sporangiophore | 6. young sporangium |

K • 3

Each carries 0.5 mark.

3 Multiple choice

- i. d. observation

K • 1

Observation means experiencing something carefully with the senses (helped by instruments). A test checks a hypothesis; a hypothesis is a testable guess; curiosity is the wish to know.

- ii. b. a base

U • 1

Only a base turns red litmus blue. (An acid would have turned the blue litmus red instead.) Soap water, limewater and baking-soda water behave like this.

- iii. d. carry it out in a fume hood

K • 1

A fume hood (fume cupboard) sucks the fumes away from the person working and out of the room, so nobody breathes them.

- iv. c. the amount of water and the place in the sun

A • 1

Only the color should differ: that is what is being tested. Everything else (the size of the bottle, the amount and starting temperature of the water, the time and place in the sun) must be the same, or the test isn't fair. The final temperature is the result you measure.

- v. d. survey

U • 1

The information is with the farmers, so it is collected directly from them, by questionnaire or interview: a survey.

4 Very short answers

- a. MARKING SCHEME

K • 1

✓ Red.

- b. MARKING SCHEME

K • 1

✓ Microscope (or hand lens).

- c. MARKING SCHEME

U • 1

✓ Only a little reaches the nose, so a harmful chemical can't hurt the nose, throat or lungs.



5 Short answers

a. MARKING SCHEME

U • 2

- ✓ A laboratory has flames, hot and breakable glass, sharp tools and harmful chemicals, which can cause accidents (burns, cuts, poisoning, eye injuries) without precautions.
- ✓ Precautions (clean apparatus, the right method, careful handling) also keep the results correct.

b. MARKING SCHEME

U • 2

- ✓ It records what was done, how, what was found and what it means.
- ✓ Others can learn from it, check it and repeat it; it is also a record for the future.

c. MARKING SCHEME

U • 2

- ✓ Any one difference, e.g. observation is experiencing something carefully with the senses (and instruments); a test is a set procedure to check whether a hypothesis is true.
- ✓ Any second difference, e.g. observation usually comes first and gives rise to a hypothesis; a test comes after a hypothesis is made.

d. MARKING SCHEME

K • 2

- ✓ The methods used to collect data in a survey.
- ✓ Any two of: questionnaire, interview, discussion, observation.

6 Long answer

ANSWER

A • 4

Hypothesis: green plants need sunlight to make food.

Method:

1. Keep a potted plant in a dark room for two days, so that the starch already in its leaves is used up.
2. Cover part of one leaf, on both sides, with a strip of black paper held by clips.
3. Put the plant in bright sunlight for 5–6 hours.
4. Pick the leaf and remove the paper. With the teacher, dip the leaf in boiling water for a minute, then warm it in alcohol in a **water bath** (never over a flame) until it turns pale, and rinse it in water.
5. Spread it on a dish and add a few drops of iodine solution.

Result: the part that got sunlight turns **blue-black** (starch was made there); the covered part stays **brown** (no starch).

Conclusion: green plants need sunlight to make their food.

The covered part of the same leaf is the **control**: everything about it (the plant, the water, the air) is the same, except the light. A simpler version: grow two similar plants with the same soil and water, one in the sun and one in a dark cupboard, and compare them after a week.

MARKING SCHEME

- ✓ A potted plant kept in the dark for two days to use up the starch in its leaves, then part of a leaf covered on both sides with black paper.
- ✓ The plant kept in sunlight for 5–6 hours; the leaf boiled in water, warmed in alcohol in a water bath until pale, rinsed, and iodine added.
- ✓ Result: the part that got sunlight turns blue-black (starch); the covered part stays brown (no starch).
- ✓ Conclusion: green plants need sunlight to make food; the covered part is the control.



7 Numerical problems

a. ANSWER

A · 2

Compost only: $14 \div 40 \times 100 = 35\%$. Check: $18 \div 40 \times 100 = 45\%$, $8 \div 40 \times 100 = 20\%$; $45\% + 35\% + 20\% = 100\%$.

MARKING SCHEME

- ✓ Percentage = number $\div$ total $\times$ 100 used: $14 \div 40 \times 100 = 35\%$.
- ✓ The three groups come to $45\% + 35\% + 20\% = 100\%$.

b. ANSWER

A · 2

Black: $34 - 20 = 14$ °C. White: $26 - 20 = 6$ °C. The black surface absorbs more heat.

MARKING SCHEME

- ✓ Rises worked out: black 14 °C, white 6 °C.
- ✓ The black surface absorbs more heat (the white one reflects most of the light).

8 Think

ANSWER

HA · 2

Without chlorophyll it can't make its own food by photosynthesis. It feeds on the bread, a dead material: its threads give out juices that digest the bread, then soak up the dissolved food. A living thing that feeds on dead matter this way is a **saprophyte**. That is also why bread goes moldy: the mold is eating it.

MARKING SCHEME

- ✓ Without chlorophyll it can't make its own food by photosynthesis.
- ✓ It feeds on dead matter (the bread), digesting it and soaking up the dissolved food: it is a saprophyte.

9 Activity: Acid, base or neutral? (Activity 1.3)

(not marked)

WHAT STUDENTS SHOULD FIND

Lemon juice turns blue litmus red and leaves red litmus red: an acid. Soap water turns red litmus blue and leaves blue litmus blue: a base. Salt water changes neither: neutral. Red litmus can only show a base and blue litmus only an acid, so a liquid is called neutral only when neither strip changes.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	13	9	9	2	33

