



Unit 1 • Scientific Learning: observing, testing and apparatus

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. curiosity
2. observation
3. experiment
4. inquiry
5. conclusion
6. schematic

K • 3

Each carries 0.5 mark.

2 Label the diagram

- | | |
|----------------|-----------------|
| 1. thermometer | 4. tripod stand |
| 2. beaker | 5. clamp |
| 3. wire gauze | 6. burner |

K • 3

Each carries 0.5 mark.

3 Multiple choice

- i. c. sense organs

K • 1

We observe with our **sense organs**: eyes, ears, nose, tongue and skin.

- ii. d. whether it burns

U • 1

Whether a thing burns (its **combustibility**) is found only by testing it with fire. Taste, roughness and warmth we find with the tongue and the skin.

- iii. c. a measuring cylinder

A • 1

Pour the water into a **measuring cylinder** and read the scale. A balance and weights measure mass, not volume.

- iv. d. it is two-dimensional

U • 1

A schematic diagram is **flat (two-dimensional)**, with no color or shading.

- v. c. glass is transparent and isn't harmed by most chemicals

U • 1

We can see **through** glass, and most chemicals don't eat it away. Glass is not very strong: it breaks if dropped.

4 Correct or wrong?

MARKING SCHEME

U • 4

- ✓ i. Correct, ✓ (we feel roughness with the skin, a sense organ).
- ✓ ii. Wrong, X (observation gives only a guess; we must measure).
- ✓ iii. Wrong, X (we can learn this way anywhere: a kitchen, a field, a farm).
- ✓ iv. Wrong, X (a thermometer does that; a measuring cylinder measures volume).

5 Match the apparatus

1. Bunsen burner → e. to make heat
2. tripod stand → a. to hold up a beaker while it is heated
3. physical balance → d. to measure mass
4. thermometer → c. to measure temperature

K • 2

Each carries 0.5 mark.



6 Very short answers

- a. MARKING SCHEME K · 1
✓ Eyes, ears, nose, tongue and skin (all five).
- b. MARKING SCHEME K · 1
✓ The skin.
- c. MARKING SCHEME U · 1
✓ Only small amounts of chemicals (samples) are used.

7 Short answers

- a. MARKING SCHEME K · 2
✓ Any two of: exact mass, exact volume, exact length, exact temperature.
✓ Any two more, e.g. whether it dissolves in water, whether it burns.
- b. MARKING SCHEME U · 2
✓ It is an experiment.
✓ Looking or lifting gives only a guess; we have to do something (put it on a balance) to find the exact weight.
- c. MARKING SCHEME A · 2
✓ No; looking can't tell whether a thing dissolves.
✓ She should do an experiment: put a little sugar in water, stir, and see whether it disappears.
- d. MARKING SCHEME U · 2
✓ Any one reason, e.g. they are quick and easy to draw.
✓ Any second reason, e.g. they show clearly how apparatus is set up; anyone can understand them; they show sizes in proportion.
- e. MARKING SCHEME U · 2
✓ Inquiry (asking, reading, searching) helps us find the reason for what we observe and test.
✓ A correct example, e.g. Ayusha can learn by asking or reading why milk won't burn in a lamp (it is mostly water); a farmer asks and reads to learn which seeds and manure suit his field.

8 Think

- MARKING SCHEME HA · 2
✓ She used observation (lamps burning with ghee and oil) and an experiment (trying milk).
✓ To find why, she must do inquiry: ask her teacher, read, or search the internet.

9 Activity: Things in your kitchen (Activity 1.1)

(not marked)

WHAT STUDENTS SHOULD FIND

Water: no color (clear), no smell, no taste, a liquid. Salt: white, no smell, salty, a solid. Sugar: white, no smell, sweet, a solid. Only the taste (the tongue) tells salt and sugar apart, which is why we use more than one sense.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	13	14	3	2	32





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. measurement
2. unit
3. mass
4. volume
5. time
6. kilometer

K • 3

Each carries 0.5 mark.

2 Label the diagram

1. thread
2. stone
3. rise: 12 ml
4. 62 ml

A • 2

Each carries 0.5 mark.

3 Multiple choice

- i. b. mass

K • 1

The amount of matter in a thing is its **mass**. Volume is the space it takes up.

- ii. a. 52 m

A • 1

100 cm = 1 m, so 5200 cm = $5200 \div 100 = 52$ m. (0.52 km would be 520 m.)

- iii. b. cm, cm³

U • 1

4 cm × 4 cm × 4 cm = 64 cm³. If the length is in cm, the volume is in cm³.

- iv. d. 6 hours 15 minutes

A • 1

9:45 AM to 10:00 AM is 15 minutes. 10:00 AM to 4:00 PM is 6 hours. Total **6 hours 15 minutes**.

- v. b. 1.8

A • 1

$1800 \div 1000 = 1.8$ kg.

4 Correct or wrong?

MARKING SCHEME

K • 4

- ✓ i. Wrong, X (a glass of gravel has much more mass than a glass of cotton).
- ✓ ii. Correct, ✓.
- ✓ iii. Correct, ✓.
- ✓ iv. Correct, ✓.

5 Match the units

1. kilogram → e. mass
2. meter → g. length
3. second → d. time
4. square meter → b. area
5. liter → f. volume
6. degree Celsius → c. temperature

K • 3

Each carries 0.5 mark.



6 Very short answers

- a. MARKING SCHEME K · 1
✓ 10.
- b. MARKING SCHEME K · 1
✓ A measuring cylinder.
- c. MARKING SCHEME A · 1
✓ A stopwatch (it measures short times exactly, to parts of a second).

7 Short answers

- a. MARKING SCHEME K · 2
✓ Mass is the amount of matter in a thing.
✓ One instrument (physical balance with standard weights, or a digital balance) and one unit (gram or kilogram).
- b. MARKING SCHEME U · 2
✓ Both are equally heavy (both are 1 kg).
✓ The cotton takes up much more space (its particles are packed loosely).
- c. MARKING SCHEME U · 2
✓ Any one, e.g. keep the tape straight, along the thing.
✓ Any second, e.g. pull it tight; start from the zero mark; read with the eye straight above the mark; measure twice.
- d. MARKING SCHEME U · 2
✓ A stopwatch starts at zero and counts up; it measures how long something takes (e.g. timing a race).
✓ A timer counts down from a time you set and rings when it is over (e.g. cooking rice for 15 minutes).
- e. MARKING SCHEME A · 2
✓ Fill a big pot to the brim with water, standing in an empty bowl, and lower the stone in until it is fully under water.
✓ Pour the water that spills into the bowl into a measuring cylinder; its volume is the volume of the stone.

8 Think

- MARKING SCHEME HA · 2
- ✓ It floats, so it doesn't go fully under the water, and the rise in the water level would be too small.
- ✓ She can tie a small stone (a sinker) to it to pull it under, and take away the reading with the stone alone (or push it under with a very thin pin).

9 Activity: A stone in water (Activity 1.14)

(not marked)

WHAT STUDENTS SHOULD FIND

The water level rises each time. Volume of the thing = (water and thing) - (water alone); $1 \text{ ml} = 1 \text{ cm}^3$. For example, water alone 50 ml, water and stone 62 ml: the stone is 12 cm^3 . A bigger thing makes the water rise more.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	15	7	8	2	32

