



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. tulsi → f. its leaves are boiled and the drink taken for sore throats, colds and coughs
2. neem → g. its twigs are used as toothbrushes and its oil as a natural pesticide
3. asuro → d. its vasicine widens the airways, so it is used for coughs and asthma
4. turmeric → e. its curcumin gives it a yellow color; it is put on cuts and wounds
5. aloe vera → c. the gel in its leaves soothes sunburn and small burns
6. yarsagumba → b. a fungus growing out of a dead caterpillar, taken as a tonic

K • 3

Each carries 0.5 mark.

2 Label the diagram

1. greenhouse gases mixed through it: CO₂, methane, water vapor...
2. about 30% is reflected back to space (clouds, snow, ice)
3. sunlight (mostly visible light) passes through
4. some infrared escapes straight to space
5. greenhouse gases absorb much of it and give it out again in all directions: part goes back down to the ground
6. the warm ground gives off heat as invisible infrared rays

U • 3

Each carries 0.5 mark.

3 Multiple choice

- i. b. climate change

U • 1

Climate change disturbs the pattern of rainfall, bringing droughts in some seasons and places and heavy rain in others.

- ii. a. swamp deer, Asian elephant, striped hyena

K • 1

All three in the first group are on Nepal's list of protected mammals. The jackal and the common leopard are not; "antelope" and "bear" are too vague (the four-horned antelope and the brown bear are protected, but not every antelope or bear).

- iii. a. rhizome

K • 1

The rhizome, the thick underground stem.

- iv. b. parasitic

U • 1

The fungus lives inside the living caterpillar, feeds on it and kills it: it is a **parasite**. (After the caterpillar dies, the fungus goes on feeding on the dead body, as a saprotroph would; but the relationship that kills the caterpillar is parasitism.)

- v. c. antimicrobial

A • 1

Neem's antimicrobial property helps keep the spots from getting infected with bacteria. (It doesn't kill the chickenpox virus, which the body's own white blood cells defeat in a week or two.)

4 Very short answers

- a. MARKING SCHEME

K • 1

✓ Any two of carbon dioxide, methane, water vapor and nitrous oxide.

- b. MARKING SCHEME

K • 1

✓ Conservation in the natural habitat (e.g. national parks, conservation areas).



- c. MARKING SCHEME K · 1
✓ Rhizome and curcumin (both needed).

5 Short answers

- a. MARKING SCHEME U · 2
✓ Any one difference, e.g. weather change is a change in the air's condition over hours or days; climate change is a change in the average weather over decades.
✓ Any second difference, e.g. weather change is local and short-lived; climate change is regional or global and long-lasting.
- b. MARKING SCHEME U · 2
✓ As the Earth warms, seawater expands (warm water takes up more space).
✓ Ice on land (glaciers, the ice sheets of Greenland and Antarctica) melts and runs into the sea.
- c. MARKING SCHEME U · 2
✓ The natural habitat gives the animal the food, water, shelter and breeding places it is adapted to; habitat loss is the biggest reason animals become endangered.
✓ In a protected habitat the animals can feed, breed and increase in number by themselves.

6 Long answers

- a. ANSWER A · 4
A (man-made reasons): burning fossil fuels, industries, deforestation, vehicles.
B (natural reasons): changes in the Sun's activity, changes in how much sunlight the Earth reflects, volcanic eruptions.
C (effects): drought and floods, rising sea level, loss of biodiversity, harm to human health, unseasonal weather, melting glaciers.
D: measures to control climate change.
MARKING SCHEME
✓ A: any two man-made reasons (burning fossil fuels, industries, deforestation, vehicles).
✓ B: any two natural reasons (changes in the Sun, changes in reflected sunlight, volcanic eruptions).
✓ C: any two effects (drought and floods, rising sea level, loss of biodiversity, harm to health, unseasonal weather, melting glaciers).
✓ D: measures to control climate change.
- b. ANSWER U · 4
1. Study and research their numbers, where they live and what threatens them (camera traps for tigers).
2. Protect their natural habitats in national parks, conservation areas and community forests: in-situ conservation.
3. Strictly stop poaching and illegal trade, and enforce the laws that protect them.
4. Breed them in zoos and breeding centers and return them to the wild: ex-situ conservation, as with gharials at Kasara.
5. Raise public awareness, and let local people share the benefits (buffer-zone income, tourism).

MARKING SCHEME

- ✓ Any one measure described, e.g. study and research their numbers and needs.
- ✓ A second, e.g. protect their natural habitat (in-situ conservation).
- ✓ A third, e.g. stop poaching and illegal trade; make and enforce laws.
- ✓ A fourth, e.g. breed them in breeding centers and release them (ex-situ conservation), or raise public awareness.



7 Numerical problem

ANSWER

A · 4

- 12 cylinders a year: $12 \times 43 = 516$ kg of carbon dioxide.
- Half the gas: $516 \div 2 = 258$ kg saved a year.
- Almost all of Nepal's electricity comes from hydropower, which makes electricity from falling water without burning any fuel.

MARKING SCHEME

- ✓ i. 12 cylinders in a year.
- ✓ $12 \times 43 = 516$ kg.
- ✓ ii. $516 \div 2 = 258$ kg (about 260 kg).
- ✓ iii. Nepal's electricity is from hydropower, which burns no fuel.

8 Think

ANSWER

HA · 2

White snow and ice reflect most of the sunlight that falls on them. When they melt, the darker rock and ground beneath absorb more sunlight and warm up, which melts still more ice: the warming feeds itself.

MARKING SCHEME

- ✓ White snow and ice reflect most sunlight; the dark ground uncovered when they melt absorbs more of it.
- ✓ So the ground warms more and melts more ice, and the warming speeds itself up.

9 Activity: Medicinal plants in your area (Activity 6.5)

(not marked)

WHAT STUDENTS SHOULD FIND

Common answers: tulsi (leaves, for coughs and colds), neem (leaves and twigs, for the skin and teeth), aloe vera (leaf gel, for burns), turmeric (rhizome, on wounds and in food), asuro (leaves, for coughs), ghod tapre (whole plant, for wounds and colds), titepati (leaves, to stop bleeding from small cuts), gurjo (stem, for fevers), bojho (rhizome, for the throat). Plants that are dug up from the wild, such as panch aunle or jatamasi, are becoming rare because they are collected faster than they can grow back.

See it at Science Playground

Exhibits and plants at the center, Bhaktapur, that go with this unit. Book a class visit at science-playground.com/booking.

- **Lauth Salla (Himalayan Yew)** (garden): Lauth salla, the Himalayan yew, was overharvested for a cancer drug; see it growing here.
- **Jatamasi (Indian Valerian)** (garden): Jatamasi is dug from the wild for its scented roots; growing it saves the wild plants.
- **Medicinal and Culinary Herbs of Nepal** (exhibit): Find the dried herbs with a yellow dot, then their living plants in the garden.
- **Amla (Indian Gooseberry)** (garden): Amla, rich in vitamin C, is one of the three fruits in triphala; find the plant.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	8	15	9	2	34

