



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. biodiversity
2. faunal
3. genetic diversity
4. quadrat
5. in-situ
6. ex-situ
7. invasive
8. sustainable development

K • 4

Each carries 0.5 mark.

2 Label the diagram

- | | |
|---------------------------------|-------------------|
| 1. steep, bare cut | 4. gabion wall |
| 2. grass, bamboo, wattle fences | 5. catch drain |
| 3. landslide | 6. roadside drain |

K • 3

Each carries 0.5 mark.

3 Multiple choice

- i. b. Brazil

K • 1

The Earth Summit was held in **Rio de Janeiro, Brazil**, in 1992, where the Convention on Biological Diversity was signed.

- ii. a. fodder and firewood are obtained from forests

U • 1

Fodder and firewood are **ecosystem services**: the variety of plants in a forest directly supports people's livelihoods. That is what makes biodiversity important to us. The others are side effects, or (the last) not a benefit at all.

- iii. c. she plants it in her kitchen garden

A • 1

Her kitchen garden is outside the plant's natural habitat, where she can look after it: **ex-situ**. Planting it back where it came from, or in a similar wild place, keeps it in natural surroundings.

- iv. d. the Brundtland Commission

K • 1

The **Brundtland Commission's** report, *Our Common Future* (1987), defined it as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- v. c. land drying out because there is less snow

U • 1

Mountain farms depend on water from **melting snow** in spring and early summer. Less snow means less meltwater: springs and streams dry up and fields go dry when the crops need water most.

4 Very short answers

- a. MARKING SCHEME
✓ Spiny babbler.

K • 1

- b. MARKING SCHEME
✓ 17.

K • 1



c. MARKING SCHEME U · 1

- ✓ To keep the crop varieties safe outside the fields, so they can be grown again if they are lost from farms (conserving genetic diversity).

5 Short answers

a. MARKING SCHEME U · 2

- ✓ Any one difference, e.g. in-situ conserves organisms in their natural habitat; ex-situ outside it.
- ✓ Any second difference, e.g. in-situ protects all the species of a large area together, ex-situ only selected (endangered) species in a small area; or in-situ: national parks, conservation areas; ex-situ: zoos, botanical gardens, seed banks.

b. MARKING SCHEME U · 2

- ✓ Within about 200 km its land rises from about 59 m to 8,849 m, so it has every climate from tropical to arctic-like, with plenty of monsoon rain and varied soils.
- ✓ Each climate has its own ecosystems (118 types), plants and animals, so Nepal has about 3.2 % of the world's plant species and 1.1 % of its animal species on 0.1 % of the world's land.

c. MARKING SCHEME U · 2

- ✓ A fire burns trees, seedlings and seeds, and kills or drives away animals, their young, eggs and nests, destroying their food and shelter at once.
- ✓ Rain then washes away the bare soil, so the forest takes many years to recover and some species may be lost from the place.

d. MARKING SCHEME A · 2

- ✓ Any one suggestion, e.g. build drains along and across the road so rainwater doesn't soak into the slope.
- ✓ Any second suggestion, e.g. cut slopes gently or in steps with gabion walls and plant grass and trees on them; or don't tip the dug-out soil down the hillside or into the river.

6 Long answers

a. ANSWER K · 4

The two methods are in-situ and ex-situ conservation.

In-situ conservation protects plants and animals in their own natural habitat, in national parks, wildlife reserves, hunting reserves and conservation areas. The organisms live naturally, all the species of the area are protected together, and it is the cheapest way to protect large numbers. Its challenges are poaching, forest fires and diseases. Nepal has 13 national parks (as of 2026), a wildlife reserve, a hunting reserve and 6 conservation areas.

Other measures: controlling poaching and the illegal wildlife trade; making more protected areas; controlling overgrazing, forest fires, pollution and unplanned urbanization; making and enforcing strong laws; and making people aware of the importance of biodiversity.

MARKING SCHEME

- ✓ The two methods named: in-situ and ex-situ conservation.
- ✓ One method explained, e.g. in-situ: plants and animals are protected in their own natural habitat, in national parks, wildlife reserves, hunting reserves and conservation areas, where all species live naturally together.
- ✓ Any one other measure, e.g. controlling poaching and the illegal wildlife trade.
- ✓ Any second measure, e.g. more protected areas; controlling overgrazing, forest fires and pollution; strong laws; awareness programs.



b. ANSWER

U • 4

The three aspects are the economic, social and environmental aspects. Draw three overlapping circles, labeled Environmental, Social and Economic: where environment and society overlap, development is bearable; where society and economy overlap, it is equitable (fair); where environment and economy overlap, it is viable; and only in the center, where all three overlap, is it sustainable. They depend on one another: the economy needs natural resources and healthy, educated people; society needs income and a healthy environment; and the environment is conserved only when poverty doesn't force people to overuse it. If one is ignored, development doesn't last.

MARKING SCHEME

- ✓ The three aspects named: economic, social and environmental.
- ✓ A Venn diagram of three overlapping circles, correctly labeled.
- ✓ The overlaps or the center named, e.g. only where all three overlap is development sustainable (bearable, equitable and viable where two overlap).
- ✓ How they depend on one another, e.g. the economy needs the environment and people; if one is ignored, development doesn't last.

7 Numerical problems

a. ANSWER

A • 2

Average = $(12 + 8 + 15 + 9) \div 4 = 44 \div 4 = 11$ per m^2 . Whole field $\approx 11 \times 50 = 550$ plants.

MARKING SCHEME

- ✓ Average = $44 \div 4 = 11$ plants per m^2 .
- ✓ About $11 \times 50 = 550$ plants in the field.

b. ANSWER

A • 2

$886 \div 9,799 \times 100 \approx 9.0\%$. $9.0 \div 0.1 = 90$ times.

MARKING SCHEME

- ✓ $886 \div 9,799 \times 100 \approx 9.0\%$ (9.04 %).
- ✓ $9.0 \div 0.1 \approx 90$ times.

8 Think

ANSWER

HA • 2

Foundation: skilled, educated people are what development is built with. Engineers design safe roads and bridges, scientists find renewable energy and better crops, doctors and teachers improve health and education, and aware citizens conserve forests and use resources wisely.

Destroyer: the same skills can be used carelessly or greedily: to cut forests faster, build badly planned roads that cause landslides, run polluting factories, poach wildlife with modern weapons, or overuse resources for quick profit.

So it depends on how skills are used. Education must teach not only skills but also **responsibility** towards the environment and future generations.

MARKING SCHEME

- ✓ Foundation: skilled, educated people design safe roads and bridges, find renewable energy and better crops, and conserve resources wisely.
- ✓ Destroyer: the same skills used carelessly or greedily cut forests faster, build roads that cause landslides, pollute or poach; so education must also teach responsibility for the environment.



9 Activity: Life in a square meter (Activity 4.1)

(not marked)

WHAT STUDENTS SHOULD FIND

For example: crabgrass and other grasses in the largest numbers (often dozens), with clover, small herbs and seedlings; among animals, ants (often the most), grasshoppers, spiders, beetles, snails and earthworms. Plants usually outnumber animals, and samples from damp and dry spots differ, which is why ecologists place many quadrats and take the average.

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.

- **Woods of Nepal** (exhibit): Compare the grain, color and weight of woods from Nepal's trees: diversity you can touch.
- **Rhododendron** (garden): Our rhododendron is lali gurans, the national flower, one of about 32 kinds in Nepal.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	15	13	7	2	37

