

Science

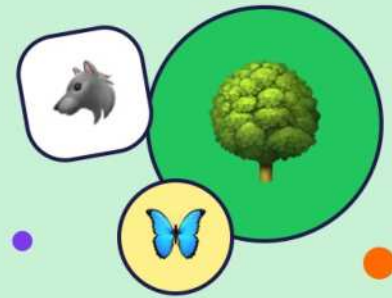
Grade 11

Ecosystems and biodiversity

Study how living things interact and why biodiversity matters.



I can explain interactions in ecosystems and the value of biodiversity.



1 Match up

Draw a line to match each pair.



☐ Mutualism •

☐ Parasitism •

☐ Competition •

☐ Predation •

☐ Decomposition •

• A. one species hunts another

• B. both species benefit

• C. breaking down dead matter

• D. one benefits, one is harmed

• E. species fight for the same resource

2**Pick the answer**

Circle the right answer.

1. Wolves were returned to a national park. Deer numbers fell and trees grew back. This is an example of...

A a trophic cascade

B photosynthesis

C mutation

2. Which increases biodiversity?

A clearing forest for one crop

B restoring wetlands

C draining ponds

3. Only about 10% of energy passes to the next level because...

A plants waste it

B animals store it all

C most is lost as heat and movement

3**True or false**

Circle true or false.

1. Biodiversity includes the variety of genes, species and ecosystems.

True

False

2. Abiotic factors are the living parts of an ecosystem.

True

False

3. Decomposers return nutrients to the soil.

True

False

4. A keystone species has a large effect on its ecosystem compared with its numbers.

True

False

5. A field with a single crop usually supports more species than a mixed woodland.

True

False

4 Biotic or abiotic?

Write each word in the right box.

temperature

fungi

soil pH

earthworms

light intensity

bacteria

rainfall

predators

Biotic factor

Abiotic factor

5 Energy in a food chain

Assume that 10% of the energy passes on to the next level. Fill in the empty boxes.

Trophic level	Energy (kJ)
Producers	20,000
Primary consumers	
Secondary consumers	
Tertiary consumers	

6 Field work calculations

Work out the missing numbers.

1. A plant stores 2,000 kJ. A rabbit gains 180 kJ from it. Efficiency = _____ %
2. 40 snails are marked and released. Later 50 are caught, and 10 of them are marked.
Estimated population = _____ snails
3. 5 quadrats contain 3, 5, 4, 6 and 2 daisies. Mean = _____ daisies per quadrat
4. Each quadrat is 0.25 m². Density = _____ daisies per m²

7



Primary succession

Number the boxes to put them in the right order.

☐

Shrubs grow as the soil gets deeper.

☐

Lichens and mosses colonise bare rock.

☐

Trees form a stable climax community.

☐

The pioneers break down rock and, when they die, form a thin soil.

☐

Grasses and small plants start to grow.

8



Apply your knowledge

Circle the right answer.

1. A farmer removes the hedgerows around a field. The most likely effect is...

A fewer habitats for birds and insects

B more pollinators

C more plant species

2. Which method estimates the population of a mobile animal?

A quadrats

B mark-release-recapture

C a belt transect of plants

3. Why are nitrogen-fixing bacteria important?

A they make oxygen

B they eat pests

C they turn nitrogen gas into compounds that plants can use

9



Think and write

Choose a local ecosystem. Describe one threat to its biodiversity and one realistic way to protect it.

How did it go?



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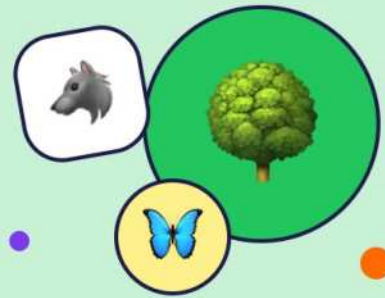
Answer key

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**B** Mutualism**D** Parasitism**E** Competition**A** Predation**C** Decomposition● **A.** one species hunts another● **B.** both species benefit● **C.** breaking down dead matter● **D.** one benefits, one is harmed● **E.** species fight for the same resource

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True or false

Circle true or false.

1. Biodiversity includes the variety of genes, species and ecosystems.

☒ True

☐ False

2. Abiotic factors are the living parts of an ecosystem.

☐ True

☒ False

3. Decomposers return nutrients to the soil.

☒ True

☐ False

4. A keystone species has a large effect on its ecosystem compared with its numbers.

☒ True

☐ False

5. A field with a single crop usually supports more species than a mixed woodland.

☐ True

☒ False

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Write each word in the right box.

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fungi

soil pH

earthworms

light intensity

bacteria

rainfall

predators

Biotic factor

fungi, earthworms, bacteria, predators

Abiotic factor

temperature, soil pH, light intensity, rainfall

5 Energy in a food chain

Assume that 10% of the energy passes on to the next level. Fill in the empty boxes.

Trophic level	Energy (kJ)
Producers	20,000
Primary consumers	2,000
Secondary consumers	200
Tertiary consumers	20

6 Field work calculations

Work out the missing numbers.

- A plant stores 2,000 kJ. A rabbit gains 180 kJ from it. Efficiency = 9 %
- 40 snails are marked and released. Later 50 are caught, and 10 of them are marked.
Estimated population = 200 snails
- 5 quadrats contain 3, 5, 4, 6 and 2 daisies. Mean = 4 daisies per quadrat
- Each quadrat is 0.25 m². Density = 16 daisies per m²

7



Primary succession

Number the boxes to put them in the right order.

4

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1

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5

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