

Exercise walk-through

1.1

Introduction to Ecosystems

AP Environmental Science

Ecosystems and niches

An **ecosystem** = living things
+ their non-living surroundings.

- **biotic** vs **abiotic**
factors
- organism → **population** →
community → ecosystem

A **niche** is a species' full "job." Two species can't share one – **competitive exclusion**.



Coral reef biome

The three ways organisms interact

predation

one organism eats another – the predator's numbers track the prey's

competition

two organisms need the same limited resource; one is excluded or the two divide the niche

symbiosis

a long-term association: *mutualism* (both gain), *commensalism* (one gains, one unaffected), *parasitism* (one gains, one is harmed)

An ecosystem is the **biotic** (living) and **abiotic** (non-living) parts of an area *interacting*. Take the interactions away and you have a list, not an ecosystem.

Exercises 2.1-2.2

2.1 Define an ecosystem.

[1]

2.2 Classify each as biotic or abiotic: (a) sunlight, (b) a frog, (c) soil, (d) bacteria.

[2]

Exercises 2.1-2.2

2.1 Define an ecosystem.

[1]

2.1

- All the living (biotic) and non-living (abiotic) things in an area, interacting

2.2 Classify each as biotic or abiotic: (a) sunlight, (b) a frog, (c) soil, (d) bacteria.

[2]

2.2

(a)

- abiotic

(b)

- biotic

(c)

- abiotic

(d)

- biotic

Exercises 2.3-3.1

2.3 Name one type of interaction between organisms.

[1]

3.1 Which is an abiotic factor?

[1]

☐

A a fish

B water temperature

C algae

D a bacterium

Exercises 2.3-3.1

2.3 Name one type of interaction between organisms.

[1]

2.3

- Any one: predation, competition, symbiosis

3.1 Which is an abiotic factor?

[1]

☐

A a fish

B water temperature

C algae

D a bacterium

3.1 B

- water temperature

Exercise 3.2 (a)

3.2 A student studies a grassland ecosystem.

(a) Give two biotic and two abiotic factors.

[2]

Exercise 3.2 (a)

3.2 A student studies a grassland ecosystem.

(a) Give two biotic and two abiotic factors.

[2]

(a)

- Biotic: e.g. grass, grasshopper; abiotic: e.g. sunlight, soil

Exercise 3.2 (b)

3.2 A student studies a grassland ecosystem.

(b) Describe one interaction between two organisms in it.

[2]

Exercise 3.2 (b)

3.2 A student studies a grassland ecosystem.

(b) Describe one interaction between two organisms in it.

[2]

(b)

- Any valid interaction, e.g. a grasshopper eats grass (predation/herbivory)

Exercise 3.3

3.3 Explain why both biotic and abiotic factors must be considered when studying an ecosystem. [2]

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3.3

- Organisms depend on abiotic conditions (light, water, nutrients) and on each other; both together determine what can live and how the ecosystem functions