Exercise walk-through

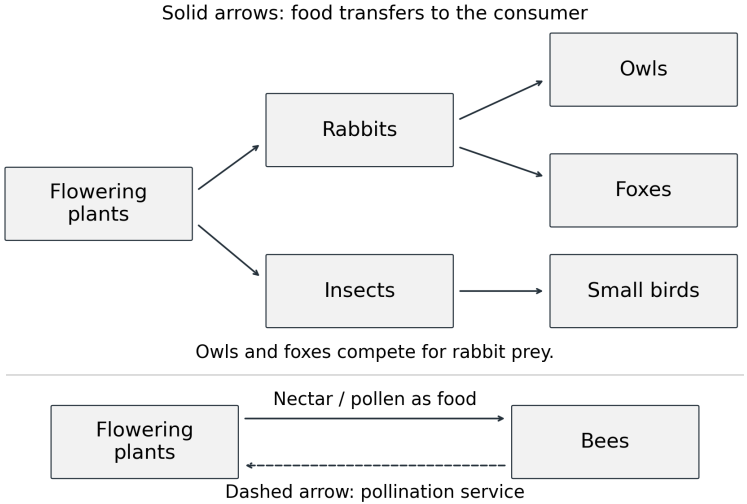
7.1
Adaptations, interdependence and competition (4.7.1)

AQA · GCSE · Biology

Communities and competition

- Plants compete for light, space, water and mineral ions from the soil.
- Animals compete for food, mates and **territory** .

Figure: Communities and competition

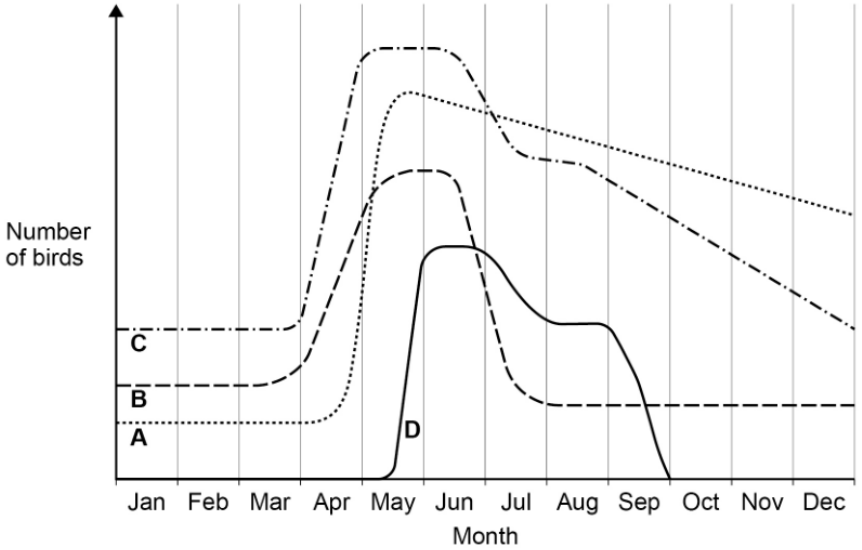


- Feeding and pollination link species in a **community**.
- Match each part of the diagram to the text.

Abiotic and biotic factors

- **Abiotic factors** are non-living.
- They include light intensity, temperature, moisture, soil pH and mineral content, wind speed and direction, carbon dioxide for plants, and oxygen for aquatic animals.
- **Biotic factors** are living.
- They include the availability of food, new predators arriving, new **pathogens**, and one species outcompeting another.

Figure: Abiotic and biotic factors



- Four bird populations through one year (AQA GCSE Biology Paper 2H, June 2023, Figure 2).
- Read the axes and units first.

Adaptations

- Structural adaptations are features of the body, such as thick fur or a layer of fat for insulation in the cold.
- Behavioural adaptations are the ways organisms behave, such as **migration** to warmer places in winter.
- Functional adaptations are processes inside the body, such as making venom or producing very concentrated urine in the desert.

Figure: Adaptations

Figure 1



Hoverfly

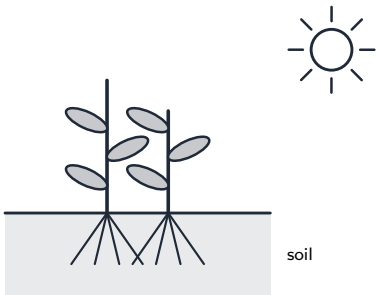


Wasp

- A hoverfly (no sting) and a wasp (AQA GCSE Biology Paper 2H, June 2024, Figure 1).
- Match each part of the diagram to the text.

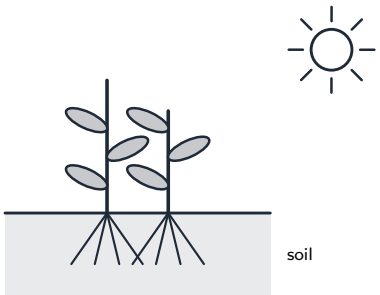
Exercise 2.1

2.1 Two plants grow close together. Give **two** things they compete for. [2]



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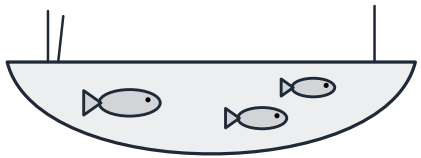


2.1

- any two: light; space; water; mineral ions

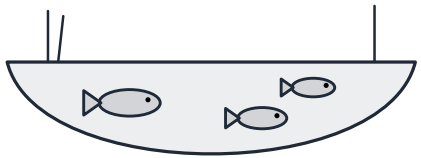
Exercise 2.2

2.2 Give **one** abiotic factor and **one** biotic factor that could change the number of fish in a lake. [2]



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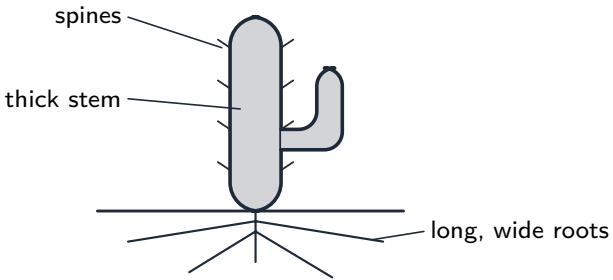


2.2

- abiotic: any one of temperature, oxygen in the water, pH, light
- biotic: any one of food, predators, disease, competition

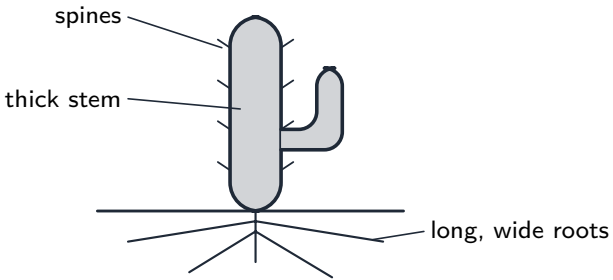
Exercise 3.1

3.1 A cactus lives in a hot, dry desert. Explain how its adaptations help it to survive. [3]



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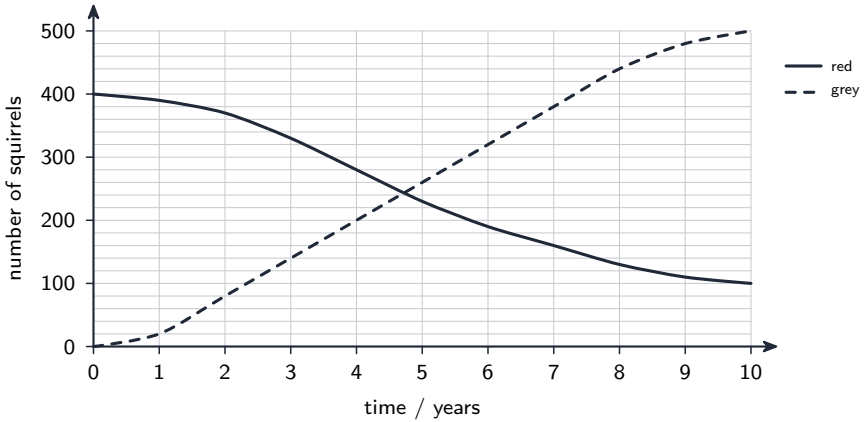
3.1

- any three: spines instead of leaves, so less water is lost; spines stop animals eating it; a thick stem stores water; long or wide roots take in water from a large area

Exercise 3.2 (a)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

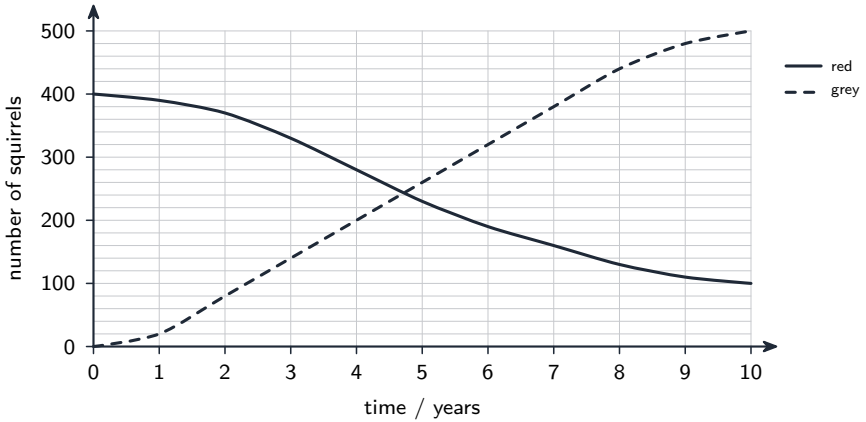
(a) Calculate the percentage fall in red squirrels from year 0 to year 10. [2]



Exercise 3.2 (a)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(a) Calculate the percentage fall in red squirrels from year 0 to year 10. [2]



(a) $\frac{400-100}{400} \times 100 = \mathbf{75}\%$

Exercise 3.2 (b)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(b) Explain why the number of red squirrels fell after grey squirrels arrived. [3]

Exercise 3.2 (b)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(b) Explain why the number of red squirrels fell after grey squirrels arrived. [3]

(b) grey squirrels compete with red squirrels for food and space; grey squirrels are better competitors, so they get more of the food; fewer red squirrels survive and breed, so the number falls

Exercise 3.2 (c)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(c) Use the graph to calculate the mean increase in grey squirrels per year between year 2 and year 8. [2]

Exercise 3.2 (c)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(c) Use the graph to calculate the mean increase in grey squirrels per year between year 2 and year 8. [2]

(c) $440 - 80 = 360$ in 6 years; $360 \div 6 = \mathbf{60}$ per year

Exercise 3.2 (d)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(d) Explain what is meant by interdependence in a forest community, and how removing one species could affect other species. [6]

Exercise 3.2 (d)

3.2 Grey squirrels were brought into a forest where only red squirrels lived. The graph shows the numbers of each over 10 years.

(d) Explain what is meant by interdependence in a forest community, and how removing one species could affect other species. [6]

(d) points to include:

- species depend on each other for food, shelter, pollination and seed dispersal
- e.g. squirrels eat seeds and also bury them, so new trees grow
- e.g. trees give food and shelter to insects and birds
- removing a prey species means less food, so predators fall
- removing a predator means prey numbers rise, then plants are over-eaten
- in a stable community these numbers stay in balance

Levels: **5–6** a full, logical answer with correct biology and correct terms; **3–4** several correct points, partly linked; **1–2** one or two relevant points.