

Combined science - Biology - Key stage 4

Ecology

Review 1

Dr Clapp



Independent practice

1. Describe how abiotic factors might explain the distribution of organisms from a wooded area out into an open field. (3)
2. A simple food chain is shown below:
Grass \Rightarrow Grasshoppers \Rightarrow Bluebirds \Rightarrow Sparrows
Explain what would happen if numbers of bluebirds started to decrease. (2)
 1. Explain why it is unlikely to be as straightforward as your answer to question 2 suggests (2)
 2. Define interdependence and provide three ways in which it occurs (4)



Independent practice - answers

1. Describe how abiotic factors might explain the distribution of organisms from a wooded area out into an open field. (3)

There would be less sunlight and lower temperatures in the wooded areas so only certain species would be able to survive. (1)

As you move out into the open field temperature would increase as would light intensity. (1)

This means that different species would be able to survive compared to in the woods. (1)



Independent practice - answers

2. A simple food chain is shown below:

Grass \Rightarrow Grasshoppers \Rightarrow Bluebirds \Rightarrow Sparrows

Explain what would happen if numbers of bluebirds started to decrease. (2)

If the numbers of bluebirds started to decrease then the numbers of grasshoppers would increase as they wouldn't be being eaten by the bluebirds. (1)

The numbers of sparrows would decrease as there wouldn't be as many bluebirds for them to eat so it would be harder to survive. (1)



Independent practice - answers

3. Explain why it is unlikely to be as straightforward as your answer to question 2 suggests (2)

**Because it is unlikely that there is a single food chain containing the 4 organisms. There is more likely to be a more complex food web containing multiple organisms (1)
so the decrease in bluebirds would affect many more species than the food chain implies (1)**



Independent practice - answers

4. Define interdependence and provide three ways in which it occurs (4)

Interdependence is the reliance of one organism on another in order to survive. (1)

Three ways in which interdependence can occur are for food, (1) for shelter (1) and for materials. (1)



Independent practice

1. Sort the following into whether they are competed for by plants or animals: (2)

Mates

Water

Sunlight

Shelter

Food

Territory

Nutrients

Space

Water

1. A gardener places bird food in his garden. He observes several pigeons, blackbirds and a squirrel all eating the food. Describe the two different types of competition that are taking place with examples. (4)



Independent practice

3. Define the three types of adaptation and give an example of each. (6)



Independent practice - answers

1. Sort the following into whether they are competed for by plants or animals: (2)

ANIMALS

Mates

Shelter

Territory

Water

Food

PLANTS

Water

Sunlight

Space

Nutrients



Independent practice - answers

2. A gardener places bird food in his garden. He observes several pigeons, blackbirds and a squirrel all eating the food. Describe the two different types of competition that are taking place with examples. (4)

Interspecific competition is competition between individuals of different species. (1)

An example would be between the pigeons and the squirrel. (1)

Intraspecific competition is competition between individuals of the same species. (1)

An example would be between several blackbirds. (1)



Independent practice - answers

3. Define the three types of adaptation and give an example of each. (6)

Structural adaptations are physical features of an organism (1) for example large, sharp teeth for killing prey. (1)

Behavioural adaptations are changes in the way organisms behave (1) for example penguins huddling together to stay warm. (1)

Functional adaptations are changes to how the body works (1) for example a plant producing toxins. (1)



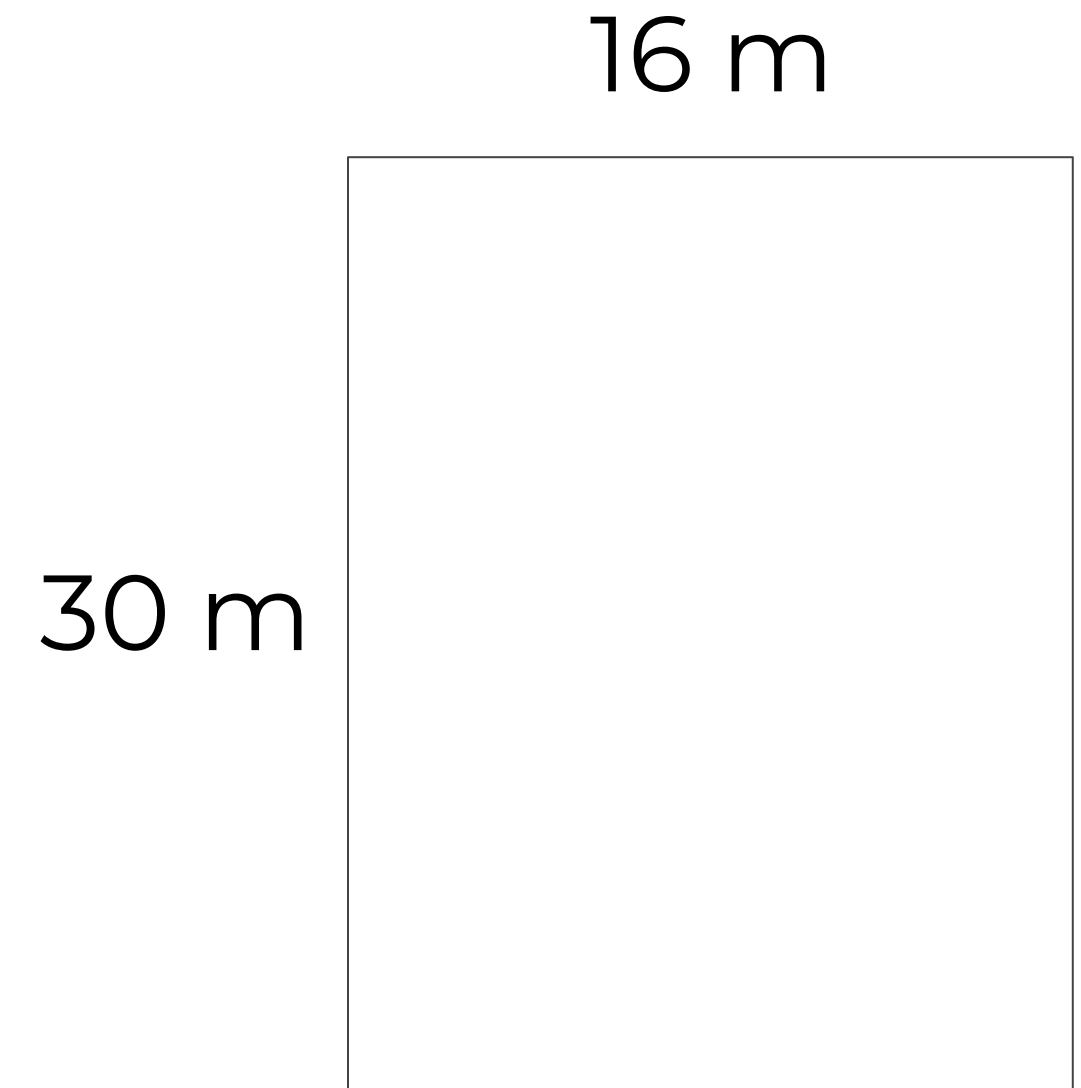
Independent practice

A 0.25 m x 0.25 m quadrat was placed 8 times in the area shown and the numbers of bluebells and dandelions were counted and recorded as:

Bluebells: 22, 19, 15, 27, 22, 31, 25, 18

Dandelions: 5, 0, 12, 18, 9, 11, 12, 14

Estimate the populations of daisies and dandelions in the area.



Independent practice - answers

Area of site = $16 \times 30 = 480 \text{ m}^2$

Area of quadrat = $0.25 \times 0.25 = 0.0625 \text{ m}^2$

Multiplication factor = $480 \div 0.0625 = 7,680$

Mean number of bluebells = $179 \div 8 = 22.4$

Estimate = $7,680 \times 22.4 = \mathbf{171,840 \text{ bluebells}}$

Mean number of dandelions = $81 \div 8 = 10.1$

Estimate = $7,680 \times 10.1 = \mathbf{77,760 \text{ dandelions}}$

