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Glue on this side

# Ecology

1	I can name biotic and abiotic factors and describe their effect on a community.
2	I can use random sampling to sample an area.
3	I can generate a hypothesis about organism distribution and test this.
4	I can use transect sampling to sample an area.
5	I can interpret data from ecological sampling.

	Keyword	Definition
1	community	The collection of the different types of organism present in an ecosystem.
2	competition	Competing with other organisms for resources.
3	consumer	Animal that eats other animals or plants.
4	decomposer	Organism that breaks down dead plant and animal material so nutrients can be recycled back to the soil or water.
5	ecosystem	The living things in a given area and their non-living environment.
6	environment	The surrounding air, water, and soil where an organism lives.
7	habitat	The area in which an organism lives.
8	population	Group of the same species living in an area.
9	producer	Green plant or algae that makes its own food using sunlight by the process of photosynthesis.

The distribution of an organism is affected by the environment and abiotic factors.

Quadrats can be used to measure the frequency of an organism in a given area e.g. the school field. You could count the individual organisms or estimate the percentage cover. You must collect data from at least two areas to make a comparison. Quadrats should always be placed randomly.

Transects are used to measure the change of distribution across an area e.g. from the edge of a river and moving further from the water's edge. You could either count the number of organisms touching the transect at regular intervals or use a quadrat placed at regular intervals along the transect.

$$\text{mean} = \frac{\text{total number of organisms}}{\text{number of quadrats}}$$



## Ecosystems

- All of the organisms which live in one area are known as a **population**
- An **ecosystem** is all of the organisms which are found in a particular location and the area in which they live in, both the living and non-living features
- A **community** are all of the areas in an ecosystem, the area in which the organisms live in is known as the **habitat**
- A **niche** is the specific role in which an organism has within an ecosystem, for example a panda's diet consists of 99 % bamboo

Prior Knowledge From KS2:  
At KS2 simple identification of plant material could have taken place but no field studies to estimate the abundance of a particular species.

## Abiotic and Biotic Factors

**Abiotic** factors are the non-living factors of an environment. E.g. moisture, light, temperature, CO<sub>2</sub>, wind, O<sub>2</sub> or pH.

**Biotic** factors are the living factors of an environment. E.g. predators, competition, pathogens, availability of food.

Future Learning:  
GCSE Biology Biodiversity will explore this topic deeper.

Why?

This topic is beyond the KS3 national curriculum. Field studies was an area that the HoS for Biology identified as a weaker area at KS4 and the decision was taken to introduce the topic at KS3 to allow spiralling of the curriculum.

Careers:  
Biologist  
Research scientist  
Farmer  
Zoologist  
Conservationist



**Figure 1** Measuring the number of plants in a particular quadrat

## Homework project

In two contrasting areas carry out an ecological survey.

Include:

1. The number of 4 different species of plant, you must use a homemade quadrat to do this. Don't forget to find random coordinate.
2. The pictures of at least 4 different animals found in the areas.
3. State how your areas are different – which abiotic / biotic factors vary.

Extension:

How does the change in abiotic / biotic factors affect the number of organisms found.

