

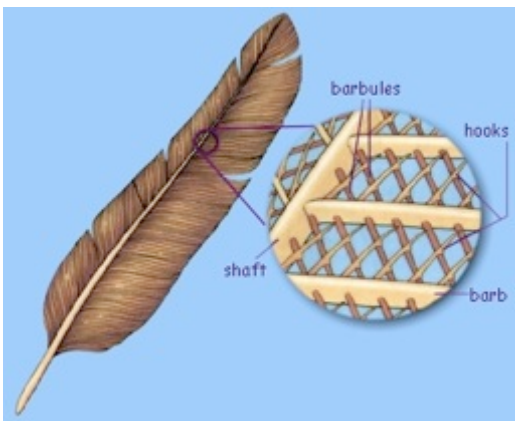
## **What is adaptation?**

***All species evolve characteristics, features or behaviours that allow them to survive in a certain habitat (or environment)***

- Animals and plants living in different habitats need different adaptations
- Adaptations enable animals and plants to live successfully in their particular environment
- There are behavioural and physical adaptations

### **Example – feathers and flight**

Birds are the only type of organism that has evolved feathers, a physical adaptation that enables flight. Migration allows birds to move long distances, usually to areas where there is more food available – this adaptation is a behaviour especially for the breeding season when there are chicks to feed.



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[www.discoverwildlife.com/british-wildlife](http://www.discoverwildlife.com/british-wildlife)

**Left: Feathers are specialised structures that are adapted for flight. Right: Young Barn Swallows in the nest; adult birds migrate from Africa to Europe annually, arriving in March/April to coincide with an abundance of insects that they catch to feed their nestlings.**

## **Environments**

Environments are usually described on a very large scale, for example deserts, polar ice caps, rainforests and savannah grasslands.

Remember that these environments may contain different habitats and microhabitats.

**Deserts** – a sandy desert might be flat or have sand formed into dunes or other formations, a rocky desert might be mountainous and contain huge rocks and boulders. Microhabitats in either of these deserts include dry riverbeds and waterholes.

**Woodlands** – woods and forests can be dominated by one type of tree or have many species side by side; they can be deciduous (shedding leaves at a particular time of year and then re-growing them seasonally) or evergreen (retaining leaves throughout the year). Microhabitats in woodland include ponds and streams, fallen logs, and even different types of tree.

## **Changing seasons and adaptation in an English woodland**

**In contrast with deserts, where the challenges faced by plants and animals are permanent (e.g. extreme heat, lack of water, scarce food resources) or experienced daily (huge variation in temperature between night and day), woodlands are more variable across the seasons.**

**Spring** (March to May) is a time for new growth as plants and animals burst into life. The first insects begin to emerge, birds – including those returning from their annual migration - are starting to sing, leaves are appearing on deciduous trees, and hibernating mammals (e.g. hedgehogs, bats) wake from their winter sleep. Spring Equinox in the UK is 20<sup>th</sup> March; this marks the ‘first’ day of spring when day and night are of equal length. Nature does not recognize calendars! The season is marked by days getting longer and the temperature rises, with plant growth stimulated by spring sunshine.

In Forest Park, look for: -

- Budburst in oak trees – the first leaves appearing
- The first bumblebees (queens searching for nest sites)
- Bluebells and primroses in flower
- Birds singing and the ‘dawn chorus’

## **A spring adaptation**



Plants that produce flowers are adapted to attract ‘visitors’, usually insects that pollinate them and enable the next generation to flourish. Bluebells can be visited by a range of insects but attract many bumblebees and these are thought to be the main pollinator.

**Summer** (June to August) is the warmest season of the year and is full of life in English woodland - the best time of year to see insects, these animals are very sensitive to the temperature and the long hot summer days bring them out in large numbers. Look out for bees and wasps, flies, dragonflies, butterflies and moths among many invertebrates. The tree canopy will be at its most dense with shadows covering the forest floor. Birds will be active, feeding their young with insects, especially caterpillars plucked from the greenery. The longest day of the year in 2017 was on 21<sup>st</sup> June, when the sun appeared just after 4am and we enjoyed daylight for between 16 and 17 hours; long periods of light and hotter temperatures encourage plant growth. There can be a shortage of water if it is very hot and dry but flooding can also occur if there are regular thunderstorms.

In Forest Park, look for: -

- Butterflies on the wing
- Birds feeding their young
- Bats feeding on insects over the river

### **A summer adaptation**



<http://preparednessadvice.com>

With so many insects active in the summer, many plants have adaptations to defend themselves from being eaten during the summer when growth is occurring. Some have chemicals that make them taste unpleasant and others, such as these nettles, have stinging hairs to deter feeding animals.

[www.biologymatters.co.uk](http://www.biologymatters.co.uk)

**Autumn** (September to November) is a time of great change and slow decay in woodland. It is also a time of 'plenty' for animals seeking food; plants and trees produce their seeds and nuts, some of which are covered with tasty pulp – berries and fruits. The leaves on deciduous trees begin to change colour and fall to the ground where they begin to rot, often speeded up by the presence of fungi that break down plant material. Some animals are feeding to prepare for winter (perhaps for hibernation) and many birds are ready to migrate to areas where food will be available over the coming winter. Insect activity dwindles from October onwards until life cycles are complete – most will die off, as they cannot survive the cold winter while some find shelter and will emerge the following spring. The days begin to get shorter and the temperature drops.

In Forest Park, look for: -

- Grey squirrels feeding on fallen acorns and chestnuts
- Birds forming flocks and searching for the remaining insects in the tree canopy
- Abundant berries on many trees and shrubs
- A deep covering of fallen leaves on the woodland floor

### **An autumn adaptation**



The winged seeds of the sycamore tree are an adaptation for seed dispersal by wind. As they fall, triggered by the strengthening autumn winds, the wings act like the blades of a helicopter, carrying the seeds away from

the parent tree to a new site to begin growth in the following spring.

**Winter** (December to February) is a difficult time in nature and is the 'quiet' time in woodland. There is not sufficient sunlight and warmth for most plants to grow and food becomes hard to find for animals and birds. It is the coldest time of the year and daylight hours are short; mid-winter's day (21<sup>st</sup> December) occurs in the week before Christmas and the day length is just under 8 hours – half the day length of mid-summer! It can be very wet, with precipitation falling as snow if temperatures are very cold, usually in January and February. All but the evergreen trees have lost their leaves so we can see the trunks and branches clearly in the absence of a canopy of leaves. All the vegetation at ground level has died back and there are no flowers for most of this period – the first snowdrops and crocuses appear from late January onwards.

In Forest Park, look for: -

- Evergreen trees – yew, holly
- Birds in large flocks coming to roost in the bare trees

## **A winter adaptation**

The leaves of evergreen trees such as yew are adapted to aid survival in the cold winter. The leaves are small with low surface area, reducing water loss and drying out in cold winds – also helped by having a tough, waxy surface. Heavy snowfall will not accumulate on the thin leaves, something that would cause branches to break off.

<http://www.greenmanlongbows.co.uk/>

