



Forestry England



## Key stage 2 lesson plan

# Temperate forests

Forestry England looks after more than 1500 woods and forests. All our forests are located within the temperate forest biome and are perfect places to learn about native woodlands and how they contrast to tropical rain forests.

### Curriculum links (KS2)

**Science: Plants;** living things and their habitats; evolution and inheritance; working scientifically.

**Geography:** locational knowledge; place knowledge (understanding geographical similarities and differences between a region of the United Kingdom and a region within South America); physical geography (climate zones, biomes and vegetation belts); human geography (land use, economic activity and natural resources); geographical fieldwork.

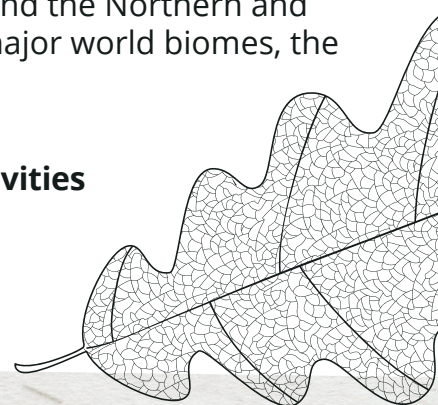
### Before your visit

Explain to the children that a biome is a vast area of Earth that has a particular climate and certain types of species that live there. Vegetation is usually the most obvious feature of the landscape, so a biome is characterised by the trees and plants that grow there.

Using a world map, ask the children to identify the position of the Equator and other significant features such as the Tropics of Cancer and Capricorn and the Northern and Southern Hemisphere. Can they locate and plot three of the six major world biomes, the boreal forest (taiga), temperate forest and tropical rainforest?

For a great introduction to the forest and how it is cared for by Forestry England, take a look at [forestryengland.uk/pre-visit-activities](https://forestryengland.uk/pre-visit-activities) for some resources to share with your class before you visit.

For health and safety advice and some top tips for teaching outdoors, visit [forestryengland.uk/planning-your-visit](https://forestryengland.uk/planning-your-visit)



### You will need to bring:

- digital recording equipment e.g. camera or tablet
- deciduous tree spotter guide\*
- leaf collectors – see back of lesson plan (photocopy these onto card and stick a strip of double sided tape to them)
- quadrats (you can make your own with garden wire) or large hoops
- woodland plant guides
- pencils and clipboards
- minibeast collecting equipment e.g. bug pots, white sheets, sweep nets
- minibeast identification charts
- animal evidence tick list\*
- forest cycle sheets\*

\*provided at end of lesson plan

For more learning resources visit  
[forestryengland.uk/learning](https://forestryengland.uk/learning)





# Information page

## Biome 1 - Boreal forest (Taiga)

This is Earth's largest biome extending in a belt across North America, Europe, and Asia. It experiences long, very cold winters, and short summers, restricting the growing season for trees to 130 days. Evergreen conifers such as pine, fir and spruce dominate the landscape. Boreal fauna (animals) include bears, moose, wolverines and lynx.



## Biome 2 - Temperate deciduous forest

This is found in eastern North America, western and central Europe, and eastern Asia. Here, the climate is generally moderate, and characterised by distinct seasons. Winters vary from cold to mild, but with up to six months free from extreme cold, the growing season extends to up to two hundred days. Natural temperate forests are dominated by hardwood broadleaved trees, most of which lose their leaves each winter, for example, oak and beech. Animals include rabbits, deer and fox. England's woods and forests are located in this biome.



## Biome 3 - Tropical rainforest

This occurs around the Equator in hot, humid regions that get more than 180 cm of rain per year. Parts of South and Central America, West and Central Africa, Southeast Asia and Australia have tropical rain forests.

The world's largest rainforest, the Amazon, is located in Brazil and covers more than half of the country. The trees here are mostly evergreen and have large leaves to capture what little sunlight penetrates down to the lower levels.





# Starter activity

Explain that one of the major differences between temperate forests, as in the UK, and tropical rainforests is that temperate forests have seasons.

Here we experience variations in temperature and rainfall throughout the year, unlike the Equator where it is hot and wet much of the time.

Can the children name all four seasons in order? Which months fall in each season? Do they know what season it is at the time of your visit? Do they have a favourite season, and why?

Ask the children to explore a small area of woodland and digitally record the seasonal signs that they find (phone, video and audio).

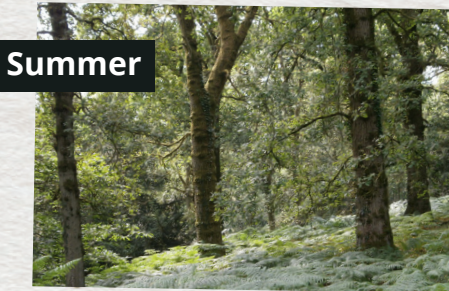


## Seasonal signs to look out for in the forest



Spring

- ☐ Wildflowers, such as celandines, primroses, bluebells and wood anemones growing on the forest floor.
- ☐ Buds or soft, new leaves on the trees.
- ☐ Trees flowering (e.g. willow and hazel) or in blossom (e.g. blackthorn).
- ☐ Birds nesting (carrying twigs in their beaks) or feeding (carrying a beak full of worms or flies).
- ☐ Woodpeckers drumming.



Summer

- ☐ Lush, green leaves on the trees creating shade on the forest floor.
- ☐ Birds continuing to feed new broods of young.
- ☐ Abundance of winged insects on sunny days.
- ☐ Wood ants on the ground in ancient woodland.
- ☐ Summer migrant birds singing (e.g. cuckoo and chiffchaff).
- ☐ Bracken, nettles and rosebay willowherb covering areas of the forest floor.



Autumn

- ☐ Leaves changing colour and falling to the ground.
- ☐ Plants dying back.
- ☐ Fruit, e.g. blackberries on trees.
- ☐ Seeds, e.g. acorns, sycamore, beech mast, sweet chestnut on trees/floor.
- ☐ Squirrels collecting and burying nuts.
- ☐ Fungi.
- ☐ Spider webs visible on dewy mornings.
- ☐ Male deer rutting.

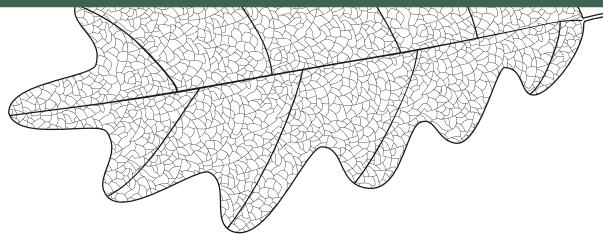


Winter

- ☐ Deciduous trees with few or no leaves.
- ☐ Evergreen trees such as pines, firs, spruces and holly keep their green needles / leaves.



# Tree identification



Temperate forests are naturally dominated by deciduous trees. These are the ones that lose their leaves in autumn, and are mostly broadleaved (see box).

By contrast, tropical rainforests are filled with trees that stay green all year, with palms being one of the most common tree types.

Using the deciduous tree spotter sheet provided at the end of the plan, and other ID guides, ask the children to try to identify some of the trees around you.

## Tree words

**Coniferous** – trees with cones and needles e.g. Scots pine, Douglas fir; usually evergreen

**Broadleaf** – trees with broad flat leaves e.g. oak, silver birch; usually deciduous

**Evergreen** – trees which keep their leaves all year round; mostly conifers (but not all e.g. holly is evergreen, but not a conifer)

**Deciduous** – trees which lose their leaves in autumn; mostly broadleaves (but not all e.g. larch is a deciduous conifer)

## Leaf collector

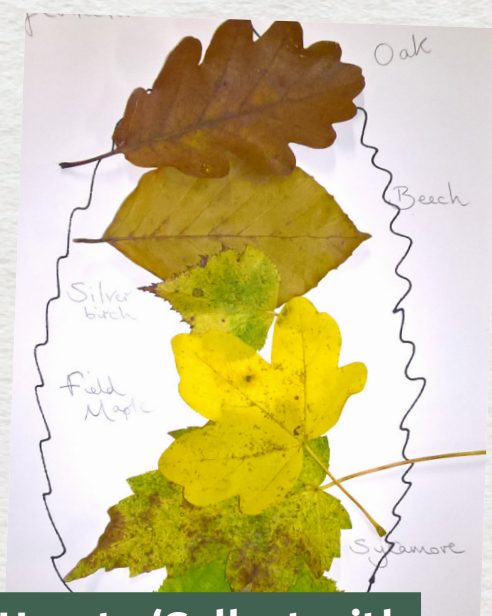
There may be a mixture of deciduous and evergreen trees in the forest. The only evergreen conifers native to Britain are Scots pine, yew and common juniper. Other evergreen species have been introduced to our forests, because they grow more quickly than deciduous trees, and are therefore faster to produce a crop of timber. Introduction of non-native species is one of the ways this biome has altered over the years.

Ask the children to think about the uses of wood (timber) from trees – why do forest managers want to plant trees that grow quickly?

Hand out the leaf collector sheets (see end of lesson plan), and ask the children to remove the top of the double sided tape, making sure that all the strips of paper go into a pocket or bin. Now ask the children to look for different leaf shapes and colours, and to save them by sticking them onto the leaf collectors.

**Can they identify any of the leaves?**

**Have they stuck on leaves from evergreens or deciduous trees, broadleaves or conifers?**



## How to 'Collect with Respect'

- **Collect from the forest floor wherever possible.**
- **Spread your load – carefully collect only a few leaves from any particular plant or tree.**



# Plant diversity

Tropical rainforests are known for the diversity of their plants. The Amazon alone is believed to have tens of thousands of species of plants, many of which are still undiscovered.

Compared with tropical rainforests, the diversity of species in a temperate forest is lower.

Explain to the children that you are going to find out how many different plants are growing on the forest floor.

Show them how to throw the quadrat carefully, then count the number of different plants growing on the ground. Can they identify any of the species?

Explain how to estimate the percentage cover of each plant at an appropriate level for the ability of your group and then ask the children to record their results in the table titled 'Plant diversity', provided at the end of the lesson plan.

Record the growing conditions too, for example, is there plenty of light reaching the forest floor? Or is it dark and shady?



## Woodland structures

Plants (including trees) are often found on different levels within the woodland. Temperate forests usually have 4 main layers:

1. The ground layer (mosses, fungi, leaf litter and decaying wood).
2. The herb or field layer (grasses, ferns, bramble and flowering plants, such as primrose and bluebells).
3. The understory or shrub layer (bushes of hawthorn and blackthorn or small trees of rowan, hazel, holly and alder).
4. The canopy layer (the highest level formed by the tops of the largest trees).

Using all of your observations and the information that you have gathered so far, photograph and discuss the layers present in your woodland.

Your images may show a wood where some of the layers are missing. If this is the case, it may be because the canopy is closed, i.e. so dense that little sunlight reaches the ground, for example, in beech woodland, or because there are deer living there. Deer eat young trees and shrubs and cause damage by rubbing their antlers against them.





# Woodland structures (cont.)

## Wildlife



The more layers present within the woodland structure, generally the larger the number of habitats provided and the wider the range of animal and bird species found there. To find out how many different creatures are living in your woodland carry out a minibeast search (see box) and look for animal clues (using the 'Wildlife in your forest' spotter sheet provided at the end of the plan).

### How to collect minibeasts

Look carefully for your minibeast, e.g. by moving logs or by using a stick to search through leaf litter. (Don't forget to put the logs back!)

When you see a minibeast, hold the collecting pot next to it and gently scoop it into the pot with a spoon or paint brush.

Another method is to place a large white sheet under a tree and shake the branches to see what falls out onto the sheet.

At the end of the session, don't forget to put the minibeasts back into a suitable habitat.

## Land use

# The forest cycle

More than 50% of Earth's tropical rainforest has been destroyed by logging, or cleared to make way for agriculture or urban development. By contrast, all Forestry England woodlands are managed sustainably. We take great pride in the fact that all of the timber harvested from our woodlands is Forest Stewardship Council (FSC®) certified.

Timber from trees in the forest is used to make things. Forestry England plants enough trees to replace any that are felled (cut down). This makes the way that we manage our woodlands sustainable, and means that the forest will always be there for animals and birds to live in, and for you to enjoy!

Using the Forest Cycle spotter sheet (at the end of the lesson plan), how many parts of the forest cycle can you spot?





# Back at school

Identify the different deciduous trees in your school grounds. Do some research - find out what properties the wood from each tree has and what it can be used for, e.g. oak produces strong timber and has always been used for buildings and ships.

Forestry England woodlands are looked after for people, timber and wildlife. Think about how people use England's woods and forests today.

Visit our website [forestryengland.uk](http://forestryengland.uk) to find out what facilities and activities are offered at our main woodland sites. How does this differ from the ways tropical rainforests are used by the people who live in them.

Timber from our forests is used to make many things like books, tissues, furniture and so much more. The Forest Stewardship Council® helps take care of forests and the people and wildlife who call them home. The logo is used to show that products are certified under the FSC® system. When you choose products with the FSC® logo, you know that you are helping to make sure our forests are alive for generations to come.

For FSC® educational resources, including lesson plans and activity ideas, go to: [fsc-uk.org/en-uk/get-involved/teachers/education](http://fsc-uk.org/en-uk/get-involved/teachers/education)



The mark of  
responsible forestry

All Forestry England woodlands in England are FSC® certified. This means that they are managed carefully and responsibly. This is not the case in all parts of the world. Visit [fsc-uk.org](http://fsc-uk.org) to find out more.

For more information about Forestry England's sustainable management of the nation's forests, please visit [forestryengland.uk](http://forestryengland.uk)



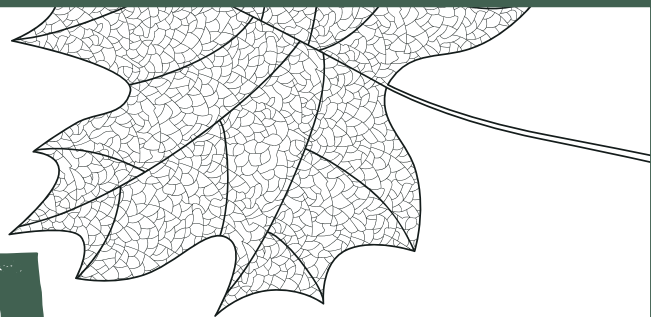
We'd like to know what you thought of this Forestry England lesson plan.

You can get in touch via email [learning.England@forestryengland.uk](mailto:learning.England@forestryengland.uk)





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# Deciduous tree spotter guide



Tick each of the trees, leaves and seeds that you spot during your visit

☐ Ash



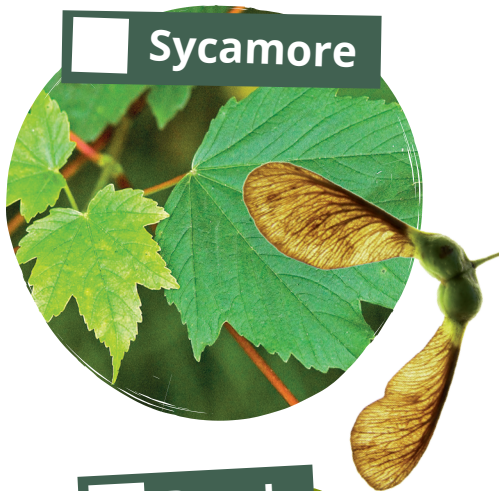
☐ Rowan



☐ Oak



☐ Sycamore



☐ Hazel



☐ Silver birch



☐ Beech



☐ Sweet chestnut



☐ Horse chestnut



How many of our two trees logos can you spot during your visit to the forest?

[forestryengland.uk/learning](https://forestryengland.uk/learning)



# Leaf collector

**Stick on as many different leaves as you can.**

Can you identify any of the trees?

*Add a strip of double-sided tape here*

A large, light green leaf template with serrated edges and a central white strip for tape. The leaf is oriented vertically with its stem at the bottom. The white strip runs from the base of the leaf towards the top, leaving a small gap at the top. The text 'Add a strip of double-sided tape here' is written diagonally across this strip.

Are the leaves from evergreen or deciduous trees?





Plant species		% of cover
<b>Total Species:</b>		<b>Total % of cover:</b> (This might be more than 100% if plants overlap)

Which season is it?	What is it like in the place where you threw the quadrat?
<input type="checkbox"/> Spring	<input type="checkbox"/> Light / sunny
<input type="checkbox"/> Summer	<input type="checkbox"/> Shady / cool
<input type="checkbox"/> Autumn	<input type="checkbox"/> Ground damp to the touch
<input type="checkbox"/> Winter	<input type="checkbox"/> Ground dry to the touch
	<input type="checkbox"/> Sloping ground
	<input type="checkbox"/> Level ground
	Other conditions of note:





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# Wildlife in your forest



Tick each of the animals, birds or evidence that you spot during your visit



☐ Bird



☐ Squirrel



☐ Animal footprint



☐ Nut or cone nibbled by animals



☐ Feather



☐ Spider's web



☐ Minibeasts



☐ Animal home



☐ Droppings (poo)



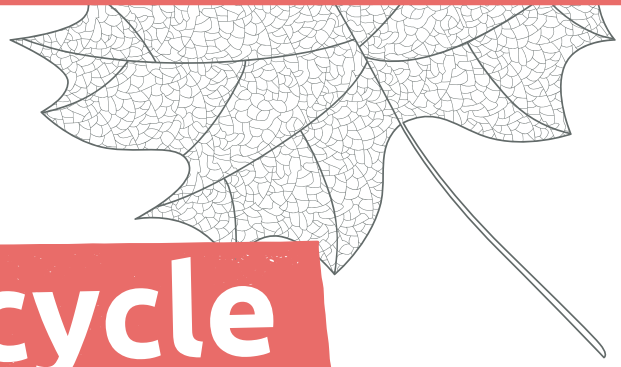
How many of our two trees logos can you spot during your visit to the forest?

[forestryengland.uk/learning](https://forestryengland.uk/learning)





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# The forest cycle

Timber (wood) from trees in the forest is used to make things. We plant enough trees to replace any that are felled (cut down). That way, the forest will always be there for animals and birds to live in, and for you to enjoy.



**How many parts of the forest cycle can you spot during your visit?**

Tick them off when you see them



[forestryengland.uk/learning](https://forestryengland.uk/learning)