

TREE CARE

Learn more about plants, including how to care for them.

LEARNING OUTCOMES

KS2 Science (year 3)

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk and leaves.
- explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow).

KS2 Literacy

- Spoken language: maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments

RESOURCES

Orchard with young or mature trees, travel blindfolds x15, children's gloves x30, wheelbarrow, children's shovels x2, (if pile of mulch available, use plastic bags to transport mulch instead of wheelbarrow and shovel), mulch, secateurs and loppers x 3, cagoules for wet weather work

Camera or iPad – check device and usage permissions

WALK TO THE ORCHARD (5 MINS)

Make sure that the children walk in pairs and check they know who is person 1 and who is person 2. They'll work with this partner for the blindfold game and bark rubbings. When you arrive at the orchard, make your way to the centre.

INTRODUCTION (10 MINS)

Where do you think you are?

Why are there lots of trees here? What kind of trees do you think they are? Why do you think they're planted like this, with big gaps between each tree?

Orchards are a group of five or more trees, planted with the intention of providing food. They often have quite big spaces between them to allow people to harvest the fruit easily and to allow light to reach all the fruit.

In order to help fruit-trees grow well, we need to understand how they work. We're going to be talk about the purpose the different parts of the trees have – the leaves, branches, trunk and roots. We're also going to play games here and celebrate the trees by making some autumnal art.

(If there are veteran or fragile old trees) Do you have any grandparents?

How do we need to treat older people? Can anyone see any old-looking trees? How should we treat them?

Check they know to avoid touching any tree props or damaging new growth on trees.

BLINDFOLD GAME (20 MINS)

Check the children know how to behave safely in the orchard e.g. not eating anything or touching anything that looks very dirty.

I want you to meet the trees. Let's play a blindfold game.

Model playing the blindfold game with another adult, emphasising the care you're taking to avoid leading them into prickly plants or over uneven ground.

- Children to stand in a circle with their partner. Person 1 to come and collect a blindfold.
- Person 1 to put on a blindfold. Person 2 turns them around a couple of times so they don't know which way they're facing.
- Person 2 leads person 1, carefully, to one of the trees and counts to 20 while person 1 feels as much of the tree as they can. They then lead them back to the circle.
- Person 1 removes their blind fold and guesses which was 'their' tree.
- Now person 2 has a turn at being blindfolded.



What did you notice about your tree?

How did the bark feel? Why do you think trees have bark? What is happening inside the tree? What is the trunk for? How does the tree trunk compare to a plant that dies back in the winter such as mint, nettles, goosegrass or chickweed?

The trunk is for supporting branches and ultimately leaves, lifting them away from grazing animals and towards the light. The bark is for protecting tree from the cold/insects/fungi/bacteria/grazing animals, surviving over winter, housing the plant's vascular system. Herbaceous (or soft-stemmed) plants like mint, nettles, goosegrass or chickweed do not have a woody stem and die back in winter. Mint and nettles stores their energy in their root systems, but the other two plants die completely and must grow from seed the following year.

CARING FOR OUR TREES (20 MINS)

Although our trees are tough, we can help them out even more.

What's underneath the ground?

What do you think the roots are for? How far out do you think they grow? How far down do you think they grow?

Roots are for anchoring the tree and transporting water and nutrients up and down the tree. Tree roots go down about 50cm but extend far beyond the drip line of the tree (the edge of the canopy). The roots go out as far as the tree is tall! The feeder roots, which do most of the work, are mostly in the area beyond the drip line. Get the children to stand at the drip line of a large tree and take a step or two back so they can visualise how far out the roots grow.

How can we help these trees out?

What do the trees need to grow? What do trees in a forest do for food and water? What could we use to feed the soil? Do you think any of the other plants growing near the tree are causing a problem? Are any of them helping the tree to grow or doing something else useful?

*Trees need **air, water, light, nutrients** from the soil and enough **space** to grow. Trees in a forest are fed by the slow decay of leaves, twigs and other organic matter. This layer of leaves etc. protects the soil from erosion, prevents weeds from germinating, traps in water, creates a habitat for little animals, and feeds the soil. Looking at plants growing under or near the trees, let's leave any clover or comfrey – Nitrogen fixers or mineral accumulators. Children can be told that these plants are useful because they feed the soil, without going into too much detail. Grass will compete with trees, especially young trees, for water and nutrients. If there are shoots growing from the bottom of the tree trunk, these will be taking energy away from the fruit-producing part of the tree, so they need to be cut away.*

-  Most children can weed around the tree bases. Put on gloves and pull out any competitive grasses and put them around the base of the tree to rot.
-  Some children can help shovel mulch around the base of the trees.
-  Children could pick up litter.
-  Children could cut any shoots growing from the base of the tree trunk using secateurs.



TIME TO RECAP (5 MINS)

What have we learned about trees today?

What parts of the tree have we focussed on? What are tree trunks for? What do roots do? What do plants need to grow? How have we helped the trees?

WALK BACK TO THE SCHOOL (10 MINS)

EXTRA NOTES – NITROGEN FIXERS, MINERAL ACCUMULATORS & FUNGI

NITROGEN FIXERS

Some plants can grab Nitrogen from the air and 'fix' it and they're called Nitrogen fixers. However, it's not actually the plant that does this useful work- it's soil bacteria. Bacteria is too small to see, but you can see where they live. If you look at the roots of a clover/bean/pea plant you may find little balls, 1-2mm across, called nodules. Bacteria live inside these nodules. Plants need Nitrogen to grow and there's plenty available in the air pockets in soil - as Nitrogen gas. Unfortunately, plants can't absorb Nitrogen gas. Bacteria transforms Nitrogen gas into nitrates or ammonium - forms plants can absorb.

Further information: https://en.wikipedia.org/wiki/Nitrogen_fixation

MINERAL ACCUMULATORS

Some plants are excellent at grabbing trace elements from the soil, for example potassium, phosphorus, calcium, magnesium and sulphur. Plants such as comfrey have very deep taproots (roots shaped like a carrot) which delve about a metre deep into soil. The nutrients they absorb end up in their leaves. These leaves can be cut off and left on the soil near fruit trees to rot and feed the soil. The leaves rot quickly and we re-grow quickly from the stump. You can cut comfrey plants to soil level three or four times every year. Other plants (without deep tap roots) such as stinging nettles and chickweed have been tested and found to be high in trace elements, so could be treated in the same way.

Further information: <https://en.wikipedia.org/wiki/Comfrey>

FUNGI

Over 90% of plants have a symbiotic relationship with fungi that lives in soil. Plants make sugar from photosynthesis and about half of this energy gets pushed out, or exuded, from roots where it's used by bacteria and fungi. In return, fungi provide plants with water and nutrients. They have very fine growths, called hyphae, that can reach much further into rocks and soil particles than plant roots. Fungi act as an extension to the plant's own root system.

Further information: <https://en.wikipedia.org/wiki/Mycorrhiza>