Tree Works

Science: Life processes and living things - 1b, 3a, b, c, d
Aims: To understand that trees need sunlight and water.
To accurately label all the different parts of a tree.

The tap root holds the plant firmly into the ground and accesses deep water supplies. Water, nutrients and minerals are taken through the root and transported through the trunk to other parts of the tree. Green chloroplasts in the leaves use energy from sunlight, carbon dioxide (CO2) and water to make plant food which is transported down the trunk to the roots.

Take a walk round a local wooded area in late spring/early summer and note down all the different tree flowers you can see. Alternatively take a walk round the same area in autumn and note down or collect examples of all the different seeds you can see.

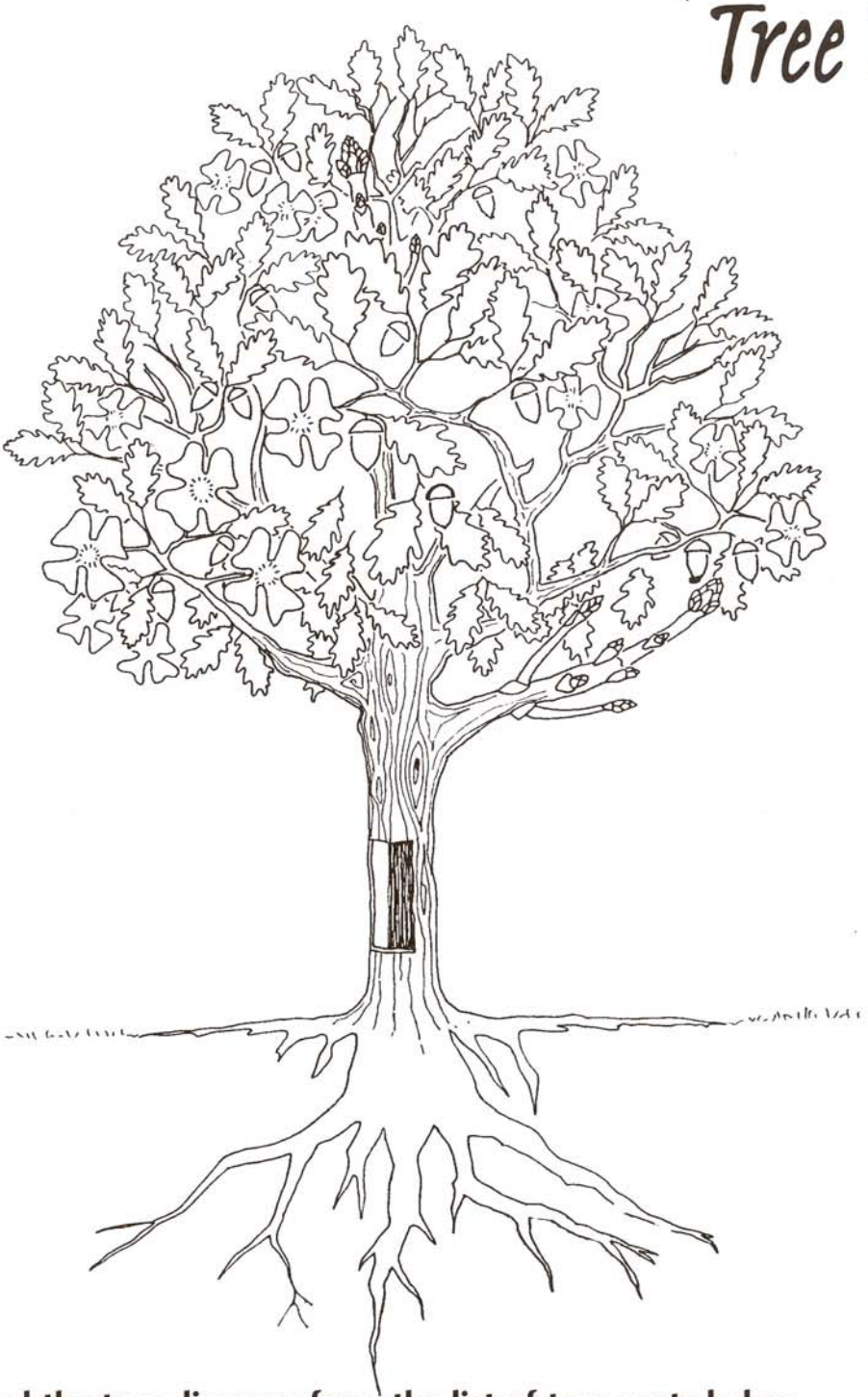
The flowers are the reproductive part of the plant - often brightly coloured or strong scented to attract insects. Seeds may be disguised as fruit or nuts to make themselves more appealing to animals and to aid seed dispersal.

Ask the class during which season(s) they would expect to see the various parts of the tree e.g. leaves in spring and summer, trunk all year round, buds in early spring.

Remember

Use the information in the 'Tree File' to help with your investigation.

Tree Works



Can you label the tree diagram from the list of tree parts below.

Trunk	Roots	Twig	Fruit, seeds or nuts
Branches	Bark	Flowers	Leaves
Buds	Crown	Tap root	Heartwood

Using a coloured pencil draw on arrows to show how water is taken up by the roots and distributed. Label your arrows.

Tree Seeds

Science: Life processes and living things 1b, 3a, b, c, d
Aim: To understand the different ways trees produce seeds and how they are distributed.

Diagram - seeds come in a variety of shapes and sizes.
To identify any seeds you find and the trees they come from refer to the trees database.

Hard cases - conkers (horse chestnut) and beech mast come in hard cases. It is important that the children realise this and open the cases to look at the seeds - they could draw both the seed and its casing.

Berries - you may also find berries - these are edible to birds and the seed is hidden inside the colourful flesh.

Keys (winged seeds) - seeds such as sycamore, ash and maple have 'wings', which help the seeds travel away from the tree to an area that has more sunlight and less competition. If you can find seeds from the different trees you can set up an experiment to compare the rate at which the different seeds fall including predicting the results, fair testing, results table and a suitable presentation method.

Fruit - fruit such as apples and pears also have seeds hidden inside edible flesh.

Catkins - birch and willow have catkins which are made up of several tiny seeds clustered together - if you find one, dismantle it and see how many seeds are involved. Because the seeds are so light they can easily travel on the wind or down rivers or streams.

Cones - fir trees produce cones - larch, pine, spruce and cedar are all species you may find. Their tiny seeds are hidden behind each lobe of the cone and these open up in warm dry conditions to release the seeds. Try collecting cones and leaving them on an outdoor window sill and observe them in different weather conditions

How does your seed travel from the tree? Choose two seeds, examine them for similarities and differences. What does this tell you about how they are dispersed?

What problems may your seed encounter on its journey? Trees produce thousands of seeds every year but they do not all grow. They may be eaten by birds, mammals or insects. They may be damaged by fungus, disease or parasites. There may be too much competition for light and water. They may not fall on good growing soil e.g. street trees. The weather may affect the size of the crop.

What does a seed need to grow?
The following worksheet looks more closely at this subject. Seeds need water, light and warmth to germinate and grow into new trees.

What birds/animals may eat your seed?
Hard cases are designed to stop animals from eating them although humans eat sweet chestnuts. Berries are designed to be bright and attractive to animals. Some birds love to eat berries. They are helping the tree by distributing the seeds in the berries over a wide area. Fruit is designed for animals to eat. Cones are tough but animals like squirrels and mice with sharp teeth can chew through to eat the seed. Winged seeds and catkins do not need animals to eat them.

Tree Seeds

Choose a tree seed to investigate in detail

1 Draw a diagram of your seed.

Include as much detail as possible.
If possible draw another diagram of the inside of your seed.

2 How does your seed travel from the tree?

3 What problems may your seed encounter on its journey?

4 What does a seed need to grow?

5 What birds/animals may eat your seed?

Tree Growth

Science: Life processes and living things 1b, 3a, b, c, d
Aims: To understand the different rates that trees grow by regularly caring and monitoring the seedlings.

Experiment

Collect a variety of seeds from trees in autumn - acorns, conkers, apples, ash keys, beech mast. Each child can then plant a seed in a small pot of compost (NOT PEAT). Growth should be monitored regularly i.e. weekly on the worksheet provided and it should be noted again that seeds need water and then light in order to grow. If they are inside, the seeds will start growing at once but if they are outside they will not grow until spring.

Germination rates of the different types of seed can be compared by placing a selection of each on wet blotting paper pressed against the side of a jam jar. Keep this in a dark place but take it out daily to compare the different germination rates. Growth rates can then be compared later and illustrated on graphs or as a series of diagrams. A quick growing seed such as bean or sunflower could be grown alongside the seeds to aid comparisons and keep interest.

As the seedlings grow ask the class to design an experiment to see what happens to a leaf if it is deprived of sunlight. Remember to use a control and to make predictions.

Background

When a seed has dispersed (by the methods noted on the previous worksheets), it may begin to grow into a new plant. This is called germination. Seeds need water, warmth and light to germinate. Some seeds do not germinate straight away which is called dormancy.

Germination begins when water enters the seed and it swells. The embryo then begins to grow. It produces a tiny root called a radicle which grows into the soil and anchors the new plant. Then a small shoot called a plumule is produced which reaches up to the light. Sometimes the seed case is pushed above ground by the shoot and sometimes it stays underground. The shoot quickly turns green and begins to produce food for the plant by photosynthesis.

Tree Growth

A table to regularly record the growth rate of your planted tree seed

Date	Height of seedling	Comments