Education at Hillworth Park – Science

Exploring Trees - The Structure of Trees

Outline

This exercise looks at the structure of trees – the constituent parts and what their function is in supporting life and growth. It can be undertaken at any time of the year (but of course there will be seasonal variation in material e.g. seeds in Autumn) and forms part of the wider 'exploring trees' material.

Aims

1. Children will be able to name the main constituent parts of deciduous and evergreen trees.
2. To identify the function of the parts of trees.
3. Establish that different species adopt different strategies for survival i.e. leaf/needle

Links to the national curriculum

Key stage 1.	Key Stage 2
Sc1 - 2a, 2b, 2c, 2f, 2g, 2h.	Sc1 – 1a, 2b,2c,2e
Sc2 – 3a, 3b, 4b.	Sc2 – 1b, 3a, 3b, 3c

Resources Needed

No resources are needed but you can use the blank tree sheets and the beech stump as part of this exercise.

Tree Parts

Trees come in many shapes and sizes and have many constituent parts. How many tree parts can the children name?

Exercise

Get the children to hunt for parts of trees on the ground around the park and bring them back to the group. Identify the parts collected and discuss their purpose and the differences between things e.g. leaves and needles, different forms of leaves or nuts/seeds.

Guide the group round the park to find other tree parts not collected e.g. roots.

Key words: Root, trunk, outer bark, inner bark (phloem), branch, crown, twig, leaf, needle, bud, flower, seed, nut, cone, fruit, sap, photosynthesis, cambium layer, xylem (sapwood).

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Roots

Roots serve three functions: to anchor the tree upright in the ground; to absorb water and nutrients from the soil; and to store sugar. All trees have lateral roots that branch into smaller and smaller roots and usually extend horizontally beyond the branch tips. Some trees have a tap root that reaches down as far as 4.5 metres. Each root is covered with thousands of root hairs that make it easier to soak up water and dissolved minerals from the soil. The majority of the root system is located in the upper 30 to 45 cm of soil because the oxygen that roots require to function properly is most abundant there.

Trunk

The trunk supports the crown and gives the tree its shape and strength. The trunk consists of the outer bark, the inner bark (phloem) the cambium layer, the sapwood (xylem) and the heartwood. The phloem acts to carry water and minerals up from the roots to the leaves, and carry sugar down from the leaves to the branches, trunk and roots. The cambium layer is the 'growth' layer responsible for building new tissue each year.

Branches/crown

The crown, which consists of the leaves and branches at the top of a tree, ensure that the tree has access to enough light for photosynthesis. It also plays an important role in filtering dust and other particles from the air as well as helping to cool the air by providing shade and reduces the impact of raindrops on the soil below.

Leaves/needles

The leaves are the food factories of a tree. They contain chlorophyll, which facilitates photosynthesis and gives leaves their green colour. Photosynthesis is the process of converting the sun's energy into carbon dioxide from the atmosphere, and water from the soil, into sugar and oxygen. The sugar, which is the tree's food, is either used or stored in the branches, trunk and roots. The oxygen is released into the atmosphere.

Why Needles?

Needles are simply modified leaves and are associated with trees whose natural habitat is either very cold and wet, or conversely, very warm and dry. They have all the constituent parts of a leaf but their reduced surface area means they lose less water through transpiration – an essential survival technique.

Some important health and safety issues:

Don't stand under a tree when there is a high wind.

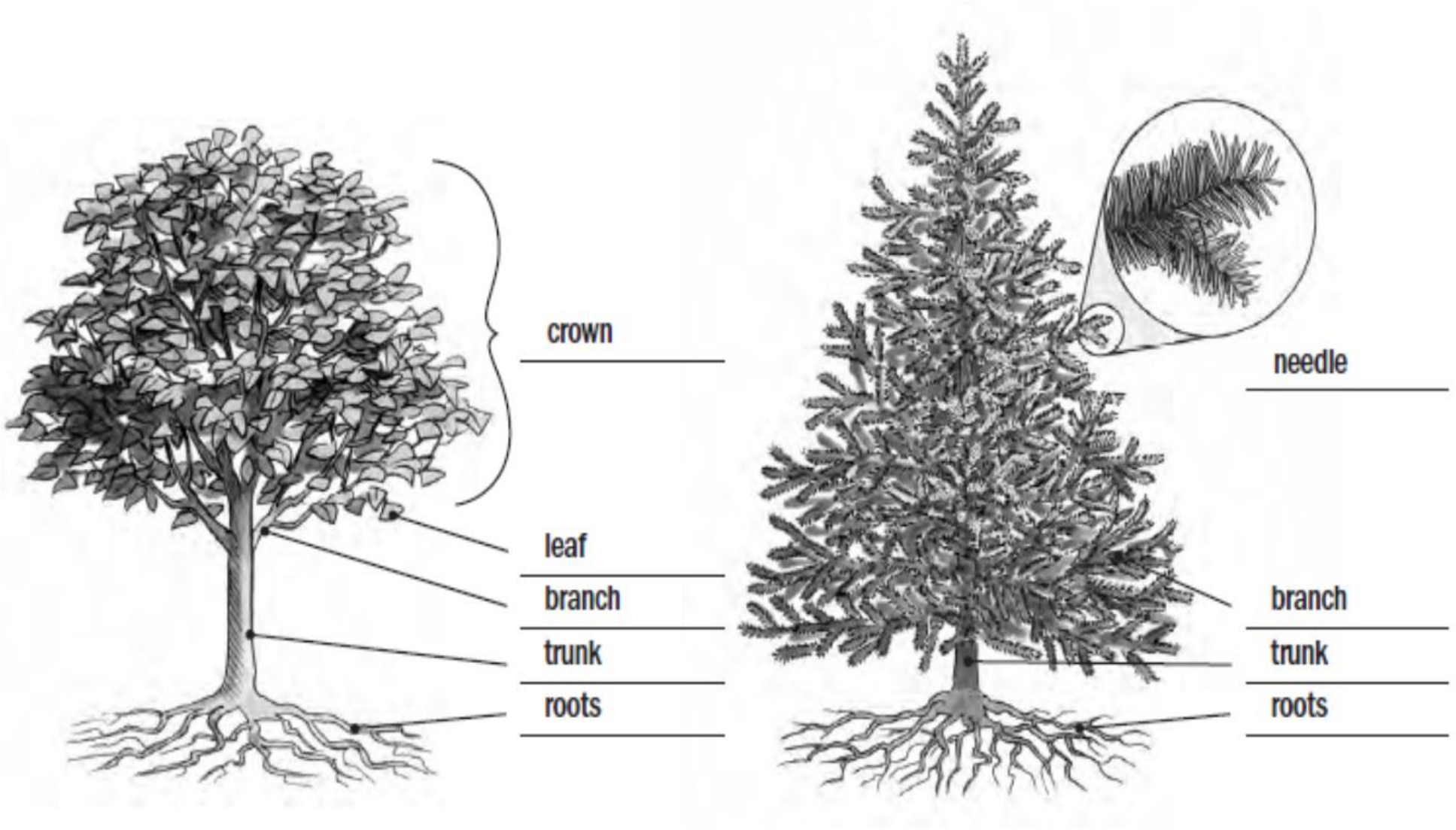
If you see any 'hanging' branches stay clear and please inform a member of staff.

Beware of other park users particularly cyclists coming through - keep the main paths clear.

Make sure everyone washes their hands before handling food.

We ensure that the park is kept clean but if we have missed something please let us know.

Toilets, drinking water and first aid kits are available at the Park Centre and office.


crown
leaf
branch
trunk
roots
needle
branch
trunk
roots

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