Tree Activity with Key Stage 1 (1 hour lesson)

The tree activity will take one hour to complete however, there are further extension and follow-up activities for teachers to continue depending on their level of interest. The objective of the lesson is to enable children to: (i) identify different types of trees (deciduous and evergreen), (ii) measure the girth and heights of trees and (iii) explain the different parts and functions of a tree. The extension activities enable children to learn (i) about the seasonality of trees, (ii) to measure the crown spread of a tree, (iii) engage in, and contribute data to, a national survey using methods employed by scientists and (iv) map the local environment and input data on the tree species they have identified and monitored.

National Curriculum 2013 Links

Science Programmes of Study: Key Stage 1

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants, including trees.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
- Observe changes across the four seasons.

Geography Programmes of Study: Key Stage 1

- Use simple compass directions (North, South, East and West) and locational and directional language [for example, near and far; left and right], to describe the location of features and routes on a map.
- Use simple fieldwork and observational skills to study the geography of their school and its grounds and the key human and physical features of its surrounding environment.

Mathematics Programmes of Study: Key Stage 1

- At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

Computing Programmes of Study: Key Stage 1

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content

Resource Checklist: (We will provide resources for the sessions we lead)

- Role badges☐
- Crayons (soft) for bark rubbings☐

- White Paper☐
- Compass ☐
- Coloured paper☐
- Blue Tack☐
- Scissors☐
- Pins☐
- Tape measures☐
- Measuring sticks to measure 1.3m☐
- Pencils and erasers☐
- Clip boards☐
- Worksheets downloaded where required ☐

Identifying evergreen and deciduous trees (15 minutes)

The teacher will explain the difference between deciduous and evergreen trees:

The school grounds have a lot of trees. Trees grow pretty much everywhere, but not all trees are the same. Two main groups of trees are:

- **Evergreen** – Evergreen trees stay green all year round, so they are called evergreens (meaning 'always green'). Conifers are a type of evergreen tree that grow cones and have thin, needle-like or scaly spikes for leaves, which is where their seeds are stored; pine trees, fir trees and spruce trees are conifers.
- **Deciduous** – deciduous trees have flat leaves that change colours in the autumn, fall off in the winter, and grow back in the spring; oak trees and maple trees are deciduous. Scientists believe that the leaves fall from the tree during the winter to prevent the leaves from getting laden with snow and the tree from rocking on windy days.

Students are asked to take rubbings of the bark of a deciduous and an evergreen tree and of the leaves from each type of tree. The children are brought back into the group and asked to showcase their drawings of the bark and to describe the similarities and differences between leaf rubbings. For example, evergreen leaves are often needle like and have a waxy and leathery texture, whilst deciduous leaves may have a broad leaf structure with a larger surface area.

Indoor activity (if too wet to go outside): The teacher uses photographs of deciduous and evergreen trees to describe their differences and brings in an assortment of wood and pressed leaves from each tree type for children to take rubbings.

Identifying the parts of a tree (15 minutes)

The teacher will explain the different parts of the tree:

- **Roots**: The roots hold the tree in the ground so that the wind cannot blow over it. A tree gets water through its roots.
- **Bark**: The bark is the skin of a tree and covers the whole of the trunk.
- **Trunk**: The trunk is the strongest part of the tree and holds up the branches. The water from the roots goes up the trunk to the leaves.
- **Branches**: A part of a tree that grows out of its trunk with leaves, flowers, or fruit growing on it. A very small branch is called a twig
- **Leaves**: Leaves are green and make the food for the tree and also evaporate water which helps to keep the surface of the leaf cool.

Students are divided into groups of 5 and assigned a different function on a sticky label. The children must work together to each enact their part of the tree. In each group children must then explain their part and function of the tree.

Indoor activity: Teachers can produce large pictures of a tree and ask the children to label the different parts and their functions. The students can also enact their part of the tree.

Extension activity: the seasonality of trees (15-30 minutes)

The teacher asks the children if trees look the same all year round? What changes do they notice? Children are then given four images of a tree and asked to draw and colour in the tree to show what it looks like in spring, summer, autumn and winter. Worksheets can be downloaded from (http://dryproject.co.uk/about-the-project/citizen-science/urban-and-rural-trees).

The children choose a tree on the school property and for a few weeks in each season spend some time observing it.

Have the children take pictures, describe it in their journals, take photographs and note down the following information:

Date of flowering: the day when they can see at least five flowers on the tree with the petals sufficiently opened to see inside the flower.

Date of bud burst: When the green of new leaves is seen protruding from between the scales of a bud.

Date of fruit ripening: When at least five fruits e.g. conkers or acorns fall from the tree.

Date of last leaf fall: Record when most or all of the leaves have fallen from the tree.

Measure tree girth and height (20 minutes)

Prior to the exercise teachers should mark a combination of large and small trees to be measured and marked. The teacher will explain how scientists measure trees to track their growth and in response to changing climatic conditions:

Do you parents measure how tall you are at home? Scientists do the same for trees they measure the tree's fatness (the girth) and height to look at changes in the growth of a tree. We can also measure the girth and height to see how tree growth might be affected by the changing weather. Scientists believe that summers are going to get warmer and drier, this affects plants because it is much harder for them to suck water that they need to grow out of the ground. The human body is made up of 60% water which we need to keep us healthy Plants are also mainly made up of water just like us. If they don't have enough water the trees can drop their leaves earlier in the season to prevent losing water through the leaf surface, the branches of trees will fall and many trees may die. We want to measure the girth and height of a tree to look at how the weather in the UK might affect the growth of trees on your school grounds. Today we will show you how to measure the girth and height of a tree.

The teachers will demonstrate to the children how to first measure the tree girth by asking some of the children to put their arms around the tree to see if they can reach around the trunk. How many children holding hands can fit around the tree? Scientists use a different method using a tape measure. The tree girth will be measured at 1.3m (show them a metre stick with the measured height) and demonstrate how to use, measure and record the girth. Students will be divided into groups to measure a specific tree with the help of a teacher. The children will read and record the measurement.

The group will then return to the base and the teachers will show them how to measure the tree height.

One person must walk away from the tree, but every so often bend forward and look through their legs back to the tree. When they can just see the top of the tree the person stops and marks it or gets someone to stand there. Another person measures the distance along the ground from the tree to the marker. This is roughly equal to the tree's height. The person can then record the height in metres. In groups the children should take it in turns to walk away from the tree and note down their observations on the team sheet which can be downloaded from (http://dryproject.co.uk/about-the-project/citizen-science/urban-and-rural-trees). The students will then all come back together in their groups and the teacher will ask them to call out their recordings. If the measurements for the same tree are different, the teacher will ask them why they think the measurements are different.

Indoor activity: The teachers draw some large pictures of trees and stick them to the wall. The children can measure the heights of the tree using the same methods.

Extension Activity: Measuring crown spread of a tree (15 minutes)

Children are split into groups of five. The teacher stands under the tree and from the centre of the tree trunk marks down the N, S, W and E directions. The children must then walk in a straight line along this direction until they are positioned just under the furthest branch from the tree trunk. One person then measures the distance from the tree trunk in each of the direction and records the results on the team worksheet.

Follow-up survey Tree Survey (40-50 minutes)

Students should be divided into teams of 6 so they are prepared for the field survey and pairs each will be given a role to play:

- **Recorders**: responsible for recording all information on the recording sheet.
- **Identifiers:** responsible for identifying the tree type (deciduous or evergreen), taking leaf samples and a photograph of the tree.
- **Managers**: responsible for overseeing the team, holding the plastic bags of leaves and helping out where necessary.

The recording sheet can be downloaded from (http://dryproject.co.uk/about-the-project/citizen-science/urban-and-rural-trees) and discussed with the students so they are clear with what they are to do. Students are taken out onto the school grounds or a local park to collect information about a specific tree in their groups. The teacher will note down the location of the tree (the tree could be numbered and marked and later identified on the map by the teacher (https://uwe.maps.arcgis.com/apps/GeoForm/index.html?appid=e7bd56d8ce984e0292c59010e353e7a3). Identifiers can try and determine whether the tree is deciduous or evergreen, take samples of the leaves, leaf rubbings and photographs of the tree (if a digital camera per group is not possible then the teacher can take responsibility for taking photographs of each tree identified in the area). Recorders will write the information down

on the recording sheet. The identifiers and managers can work together to measure the diameter, height and crown spread of the tree with the details written down by the recorders.

Optional activity

Over the spring, summer, autumn and winter get the groups to return to the same tree and note down the date of flowering, bud burst, fruit ripening, and date of last leaf fall.

Classroom: Uploading the data on a computer (10-20 minutes)

Each team could input all the information they collected themselves for their tree by visiting (https://uwe.maps.arcgis.com/apps/GeoForm/index.html?appid=e7bd56d8ce984e0292c59010e353e7a3). If uploading the data onto the DRY website is too difficult for the students, the data upload could be demonstrated by the teacher alternatively, the information could be uploaded by the teacher or a student volunteer at a later stage.

The data could also be reproduced in a table format on the white board or typed up on a spreadsheet and viewed on a projector for the entire class to see. Hold a discussion comparing the different tree measurements and use the data to construct bar charts from the findings. Repeat the measurements in spring, summer, autumn and winter for the same trees and see how the measurements have changed. As a class, make a list of at least three weaknesses of the enquiry process and further discuss what you would do differently to improve the enquiry process. The data could also be uploaded onto the Treezilla website (http://www.treezilla.org/map/) and used to calculate the ecosystem benefits of the trees in your school grounds to mitigate climate change and used to reinforce the importance of trees in your local area.