OUT AND ABOUT OUTDOOR ACTIVITIES FOR KEY STAGE 2 MATHEMATICS

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Champion Tree

Learning focus

- Measure the girth (circumference) of the trunk of a tree
- Calculate the range and mean of a set of values
- Record information in a table
- Enter information in a simple computer database
- Present data in graphical form
- Interpret information in tables, databases and graphs

Key vocabulary

- Girth
- Circumference
- Height
- Measure
- Maximum
- Minimum
- Range
- Mean

Resources

- Measuring tape
- Pencils, paper and clipboards



Activity

Introduce this activity by discussing the variety of trees. It would be useful to display photographs of trees of different shapes and sizes. Include trees of different ages, from sapling trees to ancient trees.

Explain that various groups such as the *Tree Register of the British Isles (TROBI)* and *Ancient Tree Inventory* are involved in documenting information about trees.

The *Tree Register of the British Isles (TROBI)* is a registered charity which collates information about trees throughout Great Britain and Ireland. It also provides details on the definitive champion trees – the tallest and largest of their species – by county, country and for all Britain and Ireland.

The TROBI provides guidance on how to measure trees for inclusion in the *Tree Register*. Explain that the girth of a tree is commonly measured to characterize the size of a single trunk tree.

Why keep records on tree measurements? How might these measurements be useful? How are trees measured? What might affect the growth of a tree?

Teaching point

Girth (or circumference) is a measurement of the distance around the trunk of a tree. In the UK it is found by measuring at 1.5 m from ground level on the upper side of any slope. If the tree forks or has a swelling at or below 1.5 m, then the smallest measurement below 1.5 m is recorded and the height from ground level noted.

For most trees in temperate climates, a growth ring is formed each year and so the girth of a tree increases each year.

In this activity, children will measure the girth of about 6-8 trees in order to find the 'champion' tree. (If it is not possible to measure about 6-8 trees of the same species, then measure a variety.) Invite children to suggest how they will measure the girth of a tree.

What will you need to measure the girth of a tree? How will you determine the height at which to measure? How will you find the distance around the trunk at this height? What measuring units will you use to record the girth? How will you record your findings? How will you distinguish between the different trees measured? How will you ensure that your measurements are accurate?



Assign children to small groups. Each group must choose 6-8 trees that they will measure. Since they are trying to find the 'champion' tree, they should choose what they think are the largest trees. Encourage them to estimate the girth of each tree before measuring. They should then measure and record their findings.

Teaching point

Children could use a measuring tape to mark the height at which they will measure (1.5 m from the ground). They could use chalk to indicate this height.

They could then use the measuring tape to measure the girth of the tree. They should ensure that the measuring tape is held flat against the trunk with no twists.

Once the children have measured the girth of each tree, encourage them to share and discuss their findings.

What can you say about the trees you measured? Which tree has the largest girth? Shortest girth? What is the range in your set of measurements? How did you work this out? What is the mean of all your measurements? How did you work this out? Did each group get the same results? Why / Why not? Which is the champion tree overall?

Taking ideas further

Children could record details about their trees on the *Ancient Tree Inventory* website. To complete a record, they will need to identify the location, species and girth of the tree and upload a photograph.

Children could record other measurements for their trees. For example, they could estimate the age and/or heights of their trees. They could then calculate the range and mean of their sets of data.

Children could enter the information collected into a computer database. They could sort and search the database. For example:

Ask questions which require child to search for one piece of information.

What is the estimated age of Tree A? What is the estimated height of Tree B?

For some questions, it can be helpful to sort the trees first.

Which tree is the oldest? (Sort the trees according to age.) Which tree is the tallest? How many trees are taller than the mean height? (Sort the trees according to height.)

Ask questions which require the children to search for two or more pieces of information.

Which oak tree has the largest girth? Which is the youngest sycamore tree?

Children could pose their own questions for their peers to answer.

Children could also present the data in graphical form, depending on their stage of development, and interpret the information. For example, they could use a bar line graph to show the girths or heights of their set of 6-8 trees. They could use equal class intervals to create frequency tables for grouped data (girth, height, age) relating to all the trees measured and then display a bar chart of the results.

Assessment opportunities

Are the children able to:

- Use a measuring tape to measure accurately
- Present results in a table
- Interpret the information in a table
- Understand and calculate the range and mean of a set of data
- Enter information in a simple computer database
- Sort and search a computer database to find answers to questions
- Present and interpret data in graphical form

Useful websites:

https://www.treeregister.org

https://ati.woodlandtrust.org.uk