



Carbon storage calculator

Key Stage/Age group KS3/4

Time needed for activity 45 - 60 minutes

Location Outdoor environment with access to a range of trees

Context

This activity plan highlights the importance of sustainably managing our natural resources, focusing on the important role trees have as a carbon store; absorbing carbon dioxide from the atmosphere through photosynthesis.

Natural Resources Wales' purpose is to pursue the sustainable management of natural resources in all its work. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Curriculum links

	Science	ESDGC - Consumption and waste	ESDGC - Climate change	
KS3	<ul style="list-style-type: none"> Work quantitatively, using appropriate mathematical conventions and using S.I. units appropriate to their work Make sufficient relevant observations and accurate measurements, using ICT as appropriate, to a degree of precision appropriate to the enquiry 	<ul style="list-style-type: none"> Develop a sense of responsibility for sustainable development Appreciate the actions required to reduce their own ecological footprint and to minimise waste 	<ul style="list-style-type: none"> The links between lifestyle and CO₂ emissions Make personal decisions and changes to combat global warming, such as reducing energy, travel and food miles 	<p>Please note this activity will also help you deliver multiple aspects of the national Literacy and Numeracy Framework (LNF) and Digital Competency Framework</p>
KS4	<ul style="list-style-type: none"> Work accurately and safely, individually and with others, when collecting first-hand data 	<ul style="list-style-type: none"> How to reduce their environmental impact through the concept of an ecological footprint 	<ul style="list-style-type: none"> How different gases are affecting the climate and how these gases can be reduced The links between transport and climate change 	

Objectives

By the end of this activity learners will be able to:

- measure how much carbon is stored in trees
- age and identify different types of trees
- describe how trees combat climate change by storing carbon



Equipment and resources

- Information note - Carbon
- Resource cards - Carbon equivalent
- Worksheet - Carbon calculator
- Clipboards
- Pencils
- Tape measures
- Calculators
- Tree ID sheets, books or apps

What to do

Trees take in carbon dioxide from the atmosphere and store it as carbon in their trunk, roots and leaves. Approximately half of the dry weight of a tree is carbon. This means that trees are a carbon store and can help us to reduce the effects of climate change.

During this activity learners will identify tree species, work out approximate ages, calculate the dry weight and the amount of carbon stored in a tree.

Follow the steps on the Worksheet - Carbon calculator for up to three different trees as follows:

1 Tree species

Use identification sheets, books or apps to identify the species of tree.

2 Measure the circumference

Use a tape measure to measure the circumference of the tree at chest height (1.3 metres up the trunk from the ground).

3 Age of tree

Calculate the age of the tree based on the given growth rates.

4 Dry weight

Use the conversion table to convert the circumference of the tree into the dry weight.

5 Carbon stored

Use the dry weight to calculate how much carbon is stored in the tree.

6 How do we produce this amount of carbon?

Use the Resource cards - Carbon equivalent, to find real life examples of how we create the amount of carbon which is stored in the tree.

Plenary

Relate findings to everyday examples of how we produce carbon.

Discuss what can we do to reduce the amount of carbon we produce?



Key questions

- How do we produce carbon?
- How are trees connected to our carbon emissions?
- What is a carbon store?
- How much carbon is stored in your tree?
- What can you personally do to reduce the amount of carbon released into the atmosphere?

Adapting for different needs/abilities

Less able

- Leader to complete the worksheet with whole group for one tree only.
- Break down each stage of the worksheet and check results and understanding before moving on to the next stage.

More able

- Learners complete each step independently.
- Learners can compare broadleaf and conifer conifer carbon storage capabilities.

Follow up activity/extension

- Learners calculate the carbon footprint of their household, whole school etc.
- Create an action plan to reduce the carbon footprint calculated.

Try our other tree and woodland learning resources:

- Activity plan - Seed dispersal
- Activity plan - Tree planting
- Activity plan - Carbon footprint

Additional information

See Information note - Carbon

Looking for more learning resources, information and data?

Please contact: education@naturalresourceswales.gov.uk or go to <https://naturalresourceswales/learning>

Alternative format; large print or another language, please contact:
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