Once a tree

Key Words:
Renewable resource, hardwoods, softwoods, cellulose, lignin, grain, products, factory made, woodcrafts, greenwood, Forest Stewardship Council (FSC), wood fuel.

Activity Links:
Forests for the Future: Unit 4 Renewable Energy - growing on trees. Activity 4.1 Woodfuel and Activity 2.2 Biofuel energy search, help explore and understand the topic of wood fuel and biofuels, and the video in this unit is presented by Orchard Primary School children. Bedgbury Pinetum woodfuel heating system is also shown as a case study of using local wood.

Forests for the Future: Unit 5 multipurpose material - use more wood. Activity 5.1 Once a tree trail, 5.2 Cradle to grave and 5.3 Houses of wood, can give you ideas and images to use. The video provided in this unit also gives a good overview about wood and the many benefits of using it.

School, home and garden audit: how much wood do you use? Make a list of all the things that you use every day that are made from wood and try and find out where the wood has come from. Then use this information to design posters promoting the use of British wood for the Grown in Britain campaign: www.growninbritain.org

Try an 'Un-nature trail' Select a range of objects and products or images of things that are made out of wood or wood products. For example, a pencil, paper, a wooden toy, firewood, a picture frame, magazine, cricket bat, and less obvious things like rubbers (latex from trees in rainforests) chocolate (cocoa pods from trees) etc. Choose a path or area of woodland and hide the objects there. Tell your group they have to find the objects in the same way as a treasure hunt and then make a note of:
1. What the object is?
2. What connection they think it has to wood? and
3. If they know which tree and which country the product comes from?
Bring the group back to share and discuss what has been found.

Comparing and testing wood strength Find a selection of twigs and wood from a variety of trees. Ask your group to test the strength of the twigs, observe the pattern of the grain and feel the different weights of wood. Ask them what they would use each type of wood for. Make sure you have contrasting wood like bendy willow and hard oak.

The range of wood and tree related products and economies

The Earth’s forests contain about one trillion tonnes of wood, which grows at a rate of 10 billion tonnes per year. People have always used wood and wood products – for fuel, shelter, tools and transport. Long before the invention of the wheel people were making wooden boats and sledges.

You can download the ‘wood you believe’ poster here. By kind permission of the Forestry Commission.
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Why wood?

Provided it is a product of sustainable forest management, wood is a renewable resource. Once a tree has been harvested, more trees can be planted to replace it, unlike other materials such as steel, concrete, bricks and plastic.

Timber from trees displays a great range of physical characteristics and properties, depending on tree species type. This makes wood a really diverse material with some species of tree more suitable to a certain kind of product than others. Once formed, shaped, bonded or engineered, wood becomes one of the most exciting and innovative materials we have. For those working with wood, as a carpenter, a green wood worker or as an architect designing buildings, it can be extremely satisfying – wood literally turning into something new in our hands.

Wood has also seen something of a resurgence in its use as a form of heating in our houses and business properties. As well as traditional logs, there are many more forms of wood fuel product – all can be stored and used only when needed. Our modern stoves, wood burners and boilers are now highly efficient and controllable.

And it doesn’t stop here with timber and wood either. Cellulose is the main building block of trees, and by itself it contributes towards thousands of products and manufacturing uses.

Properties of wood

Timber can be divided into ‘hardwoods’ or ‘softwoods’, but is not an indication of the strength or hardness of the timber but rather the species. Softwoods are produced from coniferous (cone bearing) trees, which are usually evergreens with needles for leaves, for example Scots pine, Sitka spruce and Yew. Hardwoods are produced from broadleaved trees, which have their seeds in a case (ovary), for example the Oak’s acorn or Walnut. Different species produce quite different sorts of timber.

The unique structure of trees gives their different properties. Most of the tissue (cellulose) in trees is arranged vertically in the tree and has bonding tissue (lignin) to help make it stiff. The vertical tissue is what you can see in the grain direction of the timber. The arrangements of the vertical elements differ between hardwoods and softwoods, and again greatly between different species. Differences in these qualities and conditions and patterns of growth over a trees’ life give timber from trees their range of properties that we characterise and measure in the following way: grain; texture; strength; moisture content; durability; chemical resistance; fire retardation; stability and grade.

For more information on trees, wood and their properties, see the ‘Finding Out More’ section at the end of this sheet.
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Making and building with wood

From small products that we might use day to day, such as chairs, picture frames and pencils to larger buildings and our homes, we are very reliant on wood. Here are some examples:

Building our homes...

There is an increasing trend to build more houses out of wood rather than traditional clay brick. The aim is for nearly 30% of new houses in the UK to be made from timber.

Real Life Example 1:
Building schools and homes

Case Study: Willmott Dixon, Forest Way School Building Project

Willmott Dixon support the Grown in Britain campaign to increase the use of timber from British woodlands. As a building company they undertake large scale projects, for example the redesign and rebuilding of new schools. The case study of Forest Way School shows not only innovation in design using wood themes and materials, but also 56% of materials were sourced within a 30 mile radius of the school. This example shows the important role of companies in leading the way on sustainable economic development by raising awareness of using British wood and decreasing our dependency on imported wood.

Case Study: Sylva Foundation One Oak House Build

Sylva Foundation One Oak House Build is the story of the ‘OneOak’ timber being used by Carpenter Oak & Woodland in preparing a frame for a new house. See more on OneOak timber framing the future.

In our homes and gardens...

Many of the things we use everyday are made from wood and may even been grown in Britain. Some of these will be made in factories in other countries but some might have been made in the UK by hand.

Real Life Example 2:
Film: The story of an Ash Tree

This film clip shows how a dining table is produced from a British Ash tree – watch how the tree is felled in the countryside and through many different processes it becomes a table in Heal’s department store in London. The film also explains how buying British wood supports not only woodlands and forests, but British businesses such as sawmills, designers, craftspeople and the many others involved in making a dining table.
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For our sports....

From sports equipment to whole sports arenas, wood has an essential role. For example, Ash is used for hockey sticks and oars as its timber is a natural shock absorber, and Willow is used for cricket bats.

The London 2012 Olympics were called the greenest Olympics ever. Using wood from sustainable sources to build the structures was part of the reason for it being green.

Real Life Example 3:

Canoe paddle made from wood Grown in Britain
Ash and sycamore, from Grown in Britain supporters Edenwood Paddles, was used to make a canoe paddle.

The cost of this paddle was the same as one made from imported wood. See http://edenwoodpaddles.co.uk/

Real Life Example 4:

London Olympics
Two thirds of all the wood used in the Olympic Parks construction was certified by the Forest Stewardship Council (FSC), meaning the timber comes from legally compliant, responsibly-managed forests. Two examples are the development of the Olympics Village and Velodrome. Village developers used the FSC certification process to ensure that they achieved the desired Code for Sustainable Homes and BREEAM assessments. The iconic Velodrome for cycling, the first Olympic Park venue to be completed, had a striking outer cladding which used 5,000 square meters of western red cedar timber and 56 kilometers of sustainably harvested Siberian pine was laid to form the track itself. The Olympic Velodrome is just one of the spectacular buildings that has taken advantage of the unique properties of wood. See more about the Olympic Velodrome here.

Dr Peter Bonfield, the first Chairman of the Grown in Britain campaign, played a crucial role in the Olympics FSC achievement. Find out more here. Hopefully, the next time the Olympics comes to the UK, all of the timber used will be Grown in Britain.

For woodfuel...

There is an increasing demand for wood to burn as fuel because more people are installing wood burners and wood-fired power plants. Wood is being promoted as a more sustainable alternative to oil, coal and gas as it is a renewable, low carbon fuel, provided it is a product of sustainable forest management or a by-product of another process. Small to medium tree and gardening businesses are benefitting from the increasing demand for fuel wood. Through the winter, the businesses can gather, split and dry the logs ready to sell the following winter. Selling firewood not only uses up spare wood but helps small to medium businesses keep in touch with their customers.

Real Life Example 5:

Woodfuel

Oxfordshire Wood Fuel Programme
This project helps community groups, woodland owners and wood fuel users connect, in order to increase the market for fuel wood.

The information and guidelines for buyers increases awareness of the importance of good quality wood.

WoodFuelBarn in the North East
Based on the edge of Chopwell Wood near Gateshead, WoodFuelBarn supply kiln dried firewood and is the leading wood fuel supplier to domestic and small business users in the North East. HEATSURE Kiln Dried Firewood is WoodFuelBarn’s own brand of kiln dried firewood. The kiln drying system developed and implemented is a green and innovative drying process ensures superior quality firewood and also reduces the carbon footprint as it is powered by biomass.

Picture: Forestry Commission
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Real Life Example 6:
‘One Oak’ products

The Sylva Foundation is a UK forestry charity and ran a project called ‘OneOak’ that followed the lifecycle of an oak tree. For more details see ‘Find Out More’ at the end of this section. Fifty products were produced from the wood of one 222 year old Oak tree. Products included jewellery, a singing bowl, sculptures and furniture.

For art, design, crafts and more...

Craftspeople and artists make beautiful objects using wood.

Reference sheet 4: Places for wood and much more looks at the meaning of woodlands as natural places for our society, our economy and our environment.
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Finding Out More:
The Grown in Britain Campaign (GiB)
Grown in Britain aims to bring together everyone who values our forests, woods and trees and the products we can make from the wood they produce. It is an incredibly positive movement that is bringing together: the environmentalists and woodland owners who contributed to the policy shaping work of the Independent Forestry Panel; the contractors, builders and retailers who want to buy, use and sell more British timber and wood-based products; woodland managers, public and private agencies who want to see many more of our woods managed to produce sustainable and legal sources of wood. To find out more and get involved in the campaign, see www.growninbritain.org

Forestry Commission facts, figures and statistics
A useful leaflet with summary statistics on forest industry employment, visitors to forests, planting and production in the UK and comparisons with other countries. See www.forestry.gov.uk/forestry/infd-7aqf6j and more detailed statistics at: www.forestry.gov.uk/forestry/infd-7aqdgc

Forest Education Network and Council for Learning Outside the Classroom Resources
Forest education Network Resources www.lotc.org.uk/lotc/forest-education/resources/
Woodland related Case studies www.lotc.org.uk/category/case-studies/

Sylva Foundation: OneOak resources
The Sylva Foundation is a charity working to revive Britain’s wood culture. It runs a number of projects under the themes of science, education and forestry. See www.sylva.org.uk
Sylvia ran an inspirational education project called OneOak. Read how 5 schools were involved with following the life cycle of an oak tree. The school children watched the tree felled, then learnt how the wood was turned into 50 products and they also participated in planting 250 oak seedling trees to create a new forest. The OneOak website contains a wealth of information, images and films from this unique 3 year project.
See http://sylva.org.uk/oneoak/?fromTab=true

Wood and Tree Products

Timber design – timber frame design – see what you think
Look at Allies Farmhouse video of converting old WW2 barns into a timber framed house www.timberdesign.com

Tree Species fact filest - www.forestry.gov.uk/forestry/INFD-6PPLQ8
The Oak - www.forestry.gov.uk/forestry/infd-Snlj46
The Scots Pine - http://www.forestry.gov.uk/forestry/infd-Snltap
The Ash - www.forestry.gov.uk/forestry/infd-Snlcmt
The Larch - www.forestry.gov.uk/forestry/infd-Snlqsh
The Silver Birch - www.forestry.gov.uk/forestry/infd-Snlkd

Good for wood
See case studies using wood www.woodforgood.com and www.woodforgood.com/case-studies/
Today's architects are creating exciting and successful buildings using the unique properties of wood, taking advantage of the ability to design and build complex structures off site, ready for fast installation on site. See more at: www.woodforgood.com/why-choose-wood

The Timber Research and Development Association (TRADA)
TRADA is an internationally recognised centre of excellence on the specification and use of timber and wood products, see www.trada.co.uk. Register for free access to this. It includes the physical properties and illustrations of more than 150 commercial species, reproduced from the popular TRADA Red Books and Wood Information Sheets. Mechanical strength included in technical data. Also look at their:
- Introducing Wood document of everything you need to know about wood as a species, botanical and property information.
- Wood information sheets.
- Wood species data: www.trada.co.uk/techinfo/tsg/

Why use wood – Forestry Commission Wales
www.forestry.gov.uk/forestry/INFD-8N13CGG

Firewood Poems
This website provides 2 poems on firewood – find out which types of trees provide the best fires in a fun way: http://logs-uk.co.uk/department/log_poems/

Did You Know?

- 20% of our timber needs are being met by the UK forests, 80% of our wood comes from other countries.
- Wood is amongst the oldest materials used by humans. There are more than 70,000 different woods known to humanity, each with their own characteristics and properties, but only a few hundred of these are used commercially throughout the world.
- Wood has over 5,000 commercial uses including paper, pencils, construction materials and even clothing, and the average person in the UK consumes 12 trees a year in their everyday life: wood, paper, packaging, cardboard, toilet tissue, etc.

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