

# The Ancient Tree Hunt

# KS3 Art and Design

## Measurement and Ancient Trees

### UNIT 3: TEACHERS SHEET

(Suggested time: 1–2 hours)

## Overview

Ask your students to imagine the size of an Ancient Tree – some of these trees are hundreds if not thousands of years old. They have taken centuries to grow and weigh many tons. Consider how many human generations have lived and died in this time, what was happening in history during this time? How do trees survive this long and why are they so unique? They are home for hundreds of different species of plants, animals, birds and insects. Our country would be a barren landscape without them.

Inside and on these trees live many small organisms – birds, plants and insects that you would probably not even notice unless you are looking for them. How can we measure the scale and size of such a tree and compare it to such a diverse range of hosts? As an example an Oak tree can support some 1,000 different species of plants and animals.

In this lesson you will attempt to measure the size of your selected tree and examine some of the smaller details such as the buds, leaves and insect life.

This lesson will assume that you are able to have studied the Ancient Tree Hunt web site as part of the introduction.

### Key Concepts met by this Unit

#### 1.1 Creativity

- Producing imaginative images, artefacts and other outcomes that are both original and of value.*
- Exploring and experimenting with ideas, materials, tools and techniques.*

#### 1.2 Competence

- Investigating, analysing, designing, making, reflecting and evaluating effectively.*
- Making informed choices about media, techniques and processes.*

#### 1.3 Cultural understanding

- Understanding the role of the artist, craftsperson and designer in a range of cultures, times and contexts.*

#### 1.4 Critical understanding

- Exploring visual, tactile and other sensory qualities of their own and others' work.*
- Engaging with ideas, images and artefacts, and identifying how values and meanings are conveyed.*
- Developing their own views and expressing reasoned judgements.*
- Analysing and reflecting on work from diverse contexts.*



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# KS3 Art and Design

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### UNIT 3: TEACHERS SHEET

## Part I Introduction

### Measurement and Ancient Trees

Demonstrate the size of an ancient tree. Stand a single student under the tree, add a group and see how many it takes holding hands to encircle the tree. Using rulers and measuring aids calculate the size of the tree the girth and height. Use the leaflet on measuring ancient trees from the Ancient Tree Hunt web site to help you. Think about the age of this tree and the history it has seen over several hundred years. Draw the tree to a reduced scale with a person underneath. This is difficult and will require a large sheet of paper. Remember the way the branches gradually reduce to thin twigs. Draw as precisely as possible using grid paper to scale. This is an exercise in Mathematics and careful observation.

Discuss Ancient Trees – their age and history – their size and scale. Engage the students in a constructive conversation as to how trees of this size can be recorded and measured. How can they be photographed and documented so that precise measurements can be used later in their work? What sort of observations do they need to make to achieve this? Consider also measurement of time for example a small seed such as the acorn over a period of time has grown to immense size forming a tree weighing many tons. How do we now interpret these scientific facts and figures and produce a creative lesson in Art and Design?

### Learning Objectives

- To study and interpret data from the Ancient Tree Hunt web site and use this as a resource in this lesson.
- To employ knowledge learned from other subjects (Maths) as a tool for making an artwork requiring measurements and scale.
- To study the subject matter (the tree) and make analytical drawings and measurements to be used in a later exercise (Part 2).
- Learn to draw from observation using a range of materials and techniques to record detail.
- Learn to appreciate and value the importance of our trees and wildlife and learn about the bio-diversity and ecology of our countryside.

### Equipment needed:

Measuring tools: 1 x long cloth or flexible tape (6–10m), rulers.

A piece of card with grid measurements to use as a device for measuring the proportion of the tree

Pencils of varying hardness HB–9B

Pencil sharpener

Rubber

Conté or charcoal

Hand cleaning cloths.

Drawing books A4 or A3

Notepads, grid paper and clipboards

Magnifying glass

Suitable outdoor clothing and shoes

Cameras

Collection bag for small leaves, seeds and twigs  
(Please take care not to damage any trees)



# The Ancient Tree Hunt

# KS3 Art and Design

## Measurement and Ancient Trees

### UNIT 3: TEACHERS SHEET (Part 1 cont)

## Activities

For this first part of the lesson you will need to arrange a location trip to the site of an Ancient Tree. Prior to this visit ensure that you have looked at the Ancient Tree Hunt web site and downloaded useful leaflets such as identifying tree species, measuring trees and familiarising your pupils with the concept of the site and the country code. Have with you the resources for recording and measuring your tree.

- **Look at the tree chosen.**

What shape is it? Does it lean or bend, is it straight and upright with one large trunk or is it a tree with multiple branches? Is it a maiden tree or a pollard? Is it hollow or damaged? Can you identify what species it is?

All of the information required to understand these different terms is available on the Ancient Trees web site, view here for a list of publications available. [www.woodland-trust.org.uk/ancient-tree-forum/atfresources/resourcesbooks.htm](http://www.woodland-trust.org.uk/ancient-tree-forum/atfresources/resourcesbooks.htm).

### Surveying and Measuring Your Chosen Tree

Now discuss these thoughts with your students while investigating the chosen tree (taking time to survey all around your tree).

- **What sort of condition is it in?**
- **Does it have any dead branches or a hollow trunk?**  
If so this may show that it is in the last 1/3rd of its life. The rough guide for a tree's life is that trees grow for 1/3rd, live for 1/3rd and die for 1/3rd. Remembering that a tree can easily live for 600 years dividing that by 3, means 200 years of decline towards the end of its life if it lives for 600 years.
- **Record the species and condition of your tree.**  
For example it may be hollow (another sign of age).
- **Ask yourself how heavy is this tree?**  
How does it support such huge branches that extend out for maybe 20 metres?  
What sort of root structure does it have to withstand

the storms and gales and continue to support this immense weight? Often the roots of a tree will extend out underground as far as the branches in their search for water and nutrients and as an anchor to support this huge mass.

- **How do you measure the age of your tree?**  
See the tree-measuring guide on the Ancient Tree Hunt web site [www.woodland-trust.org.uk/ancienttreeforum/atfresources/resourcesbooks.htm](http://www.woodland-trust.org.uk/ancienttreeforum/atfresources/resourcesbooks.htm)  
One way of measuring is to ask several pupils to stretch their arms around the tree until they can reach each other and then get them to stand in a line with arms out stretched and measure the length. This is the circumference of your tree. Take a photograph of them with their arms out stretched as part of your photo collection along with pictures of them measuring and sketching the tree. (Later you can use these photographs as part of links to other lessons involving tree projects).
- **Now how can we estimate the height of this tree?**  
Stand well back from the tree and look up at the tallest leaf or branch. Imagine it were to fall where would you stand so that the top of the tree just fell at your feet. From this point count your steps towards the trunk of the tree – measure your stride and multiply it by the number of steps and you have a rough idea of the height. Make a note of all these details. For a more accurate measurement a clinometer (a device for measuring the height of objects) can be used, but these can be expensive and for the purpose of our lesson measuring the steps will be simple and fairly accurate.
- **Now measure the spread of the tree**  
– this is the distance that the branches spread out from the trunk. It may be that your tree is uneven and one side protrudes more than the other. Why is this? Perhaps there is a building or other trees to the side preventing its growth in that direction. Trees, like flowers naturally fight



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### UNIT 3: TEACHERS SHEET

#### (Part 1 cont)

for the light so they will grow towards the brightest source. Why do they do this? So that the leaves can use the light to make energy and food for the tree so that it can grow. This is called photosynthesis.

**Your students now have essential facts about their tree in note form and a set of activity photographs**

- **Now to draw and photograph the tree.**

This needs to be done as carefully and accurately as possible because in the next lesson they will need this detail to prepare the scaled up artwork

- **Start by taking photographs of the tree.**

Ask students to stand well back in order to get the whole tree in the frame including all of the side branches. This is important because they will need this to use as a reference when making the scaled version. Why not ask someone to stand under the tree to demonstrate the scale of them against the tree, try also to make a photographic record of the activities as this may well fit in with future projects in design or a story that you may put together with the English and history departments. If it really attracts you it may be something that can be done as a project outside school involving the local community and their knowledge of the countryside.

Also take more detailed pictures around the tree.

Take close up pictures of the trunk, branches, leaves and buds. Students can use these for doing more detailed work on the final artwork.

- **Make sketches and observations as drawings.**

These often convey more than a photograph because it allows you to study, detail and form, which the person drawing will be able to observe. It only takes a few seconds to point a camera but drawing for 15-30 minutes can be more absorbing and interesting with the benefit of watching for wildlife at the same time, unless of course you are a keen photographer in which case you will also be looking carefully for the right light and angle to capture the magic moment.

Some of the class may wish to draw the whole view of the tree so that they can use this to scale up for their final version rather than using a photograph. Use unit 3 student worksheet and using a pencil held up to measure the proportions of the tree ask students to carefully draw in the detail and size and shape of the tree. An alternative to using your pencil to measure with is to have ready a piece of card with similar grid measurements marked out on it rather like a ruler. This can be held at a point where the top and bottom marks respectively show the top and base of the tree. Branches and points in between can then be marked more easily and translated onto grid paper into a drawing book. This grid can be scaled to suit the size of the paper in the pad.

This is an important exercise as it gives the guidelines to draw any subject in proportion whether it is a tree, landscape, face or still life.

Discuss with students that drawing from observation is always the best way of understanding a subject. You can see it and walk around it, touch it, is it soft or rough, how can you then use your pencils and charcoal to produce this effect on paper? In the next part students may want to use a range of materials to gain the effect you want. Sharp pencils record fine detail while soft pencils and charcoal record soft or solid areas. Ask students to try practising with these to see which give the results they like.

Students can take some time to draw and collect leaves, seeds and twigs, as these can also become part of the finished work. As a group exercise students can be split into groups so that some draw the whole tree and others make detailed scale drawings of the objects collected again using the grid to help gauge the correct proportions.

At this stage they should now have a range of drawings and close observations along with a series of photographs and notes about their tree.



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## Measurement and Ancient Trees

### UNIT 3: TEACHERS SHEET

## Part 2 Learning objectives

- Translate the information recorded in the outdoor session into a scaled finished drawing or painting.
- Learn how to use a grid to scale and measure artwork.
- Examine and analyse organic objects in detail and record this information.
- Select and use the most suitable media for their work.
- Use knowledge of other subjects such as Maths and History to support the learning.
- Work together as a team to produce final artwork.
- Discuss each other's work in a fair and critical manner to improve on the results.

## Activity (Notes)

Discuss with students that each time we draw something we are naturally scaling the subject to fit the paper even without thinking about it. Our brain has the ability to see an object and know that it is round or straight or slightly bumpy. It can tell if it is soft or hard, rough or smooth. Careful observation and analysis enables us to produce drawings of the most complex subjects. Given that we are using materials that we can use to draw fine details or paint large areas with they can now produce scale impressions of their chosen tree.

## Activity (Method)

### Work with students (Using the student worksheet where appropriate) to;

Either scale down drawings if it is of the whole tree using a grid to calculate the position of trunk and branches, or draw the seeds or leaves actual size or larger than they are.

Ask students to take a twig with a cluster of leaves as an example. If this fits on to the paper try carefully transferring the size of the leaves to the paper, the thickness of the woody twig or small branch also using careful observation. Reproduce the shape and texture of the leaves and the

### Equipment needed:

Rulers  
Pencils of varying hardness HB–9B  
Pencil sharpener  
Rubber  
Conté or charcoal  
Hand cleaning cloths  
Magnifying glass  
Drawing books A4 or A3  
Notepads, grid paper and clipboards  
Water pots and painting materials  
Photographic prints, notes and drawings from the earlier session (Part 1).

woody parts. Look at the buds, new growth and old growth. Use a grid to help them scale each part to the correct position on the paper.

Or if you prefer students can use the grid to enlarge their leaves, say 4–10x larger. Look carefully at the spacing and distance between the details on the leaves and twigs. They will need a magnifying glass to see detail closer than x1. Look carefully at the size of a vein on a leaf compared to the whole leaf. This is where measurement is important and the media such as the pencils they use are also important, you cannot draw a fine line with a large brush or a soft pencil. Study Matisse and Picasso their drawings are full of very exact details yet they both paint and produce the freest and most creative work. The important point to be made here is that attention to detail and careful study balanced with a creative mind that can express freely will produce the most exciting results. Ask students to experiment with hard and soft pencils to see what kind of lines these can produce. Working with a combination of pencils and charcoal will give you a wide range of results.

# The Ancient Tree Hunt

## KS3 Art and Design Measurement and Ancient Trees

### UNIT 3: TEACHERS SHEET (Part 2 cont)

Ask students to try enlarging a leaf from actual size to fit their page – get them to look at the fine detail with a magnifying glass and scale it up to a larger size using the grid on the student worksheet. Think about the composition of the page; use their design skills to make an interesting layout. It doesn't matter if part of the leaf or twig is cropped this is where creative licence come in to move objects and overlap parts to make your design special.

If they have chosen to make their artwork of the whole tree or even a combination of both they can start to work in the finer details of the tree either from the previous drawings they have made or from photographic enlargements.

The exercise in measurement and scale should have produced some fairly accurate results at this stage. Discuss the results and decide where things could have been improved or where results have shown some extremely fine work, why they have been successful.

#### Discuss with students how this project could be continued:

For example this could be a way of illustrating the species of a tree. If it were an Oak then showing the tree shape (which is quite distinctive), leaves, acorns and buds would make an interesting poster.

By adding colour and texture this can develop into a painting, textiles or batik project.

Perhaps they could start thinking about creating a book of tree illustrations from your local area using illustrations and scanning to design this on a computer.

As a local project, for example - interviewing elderly locals who have some memory of how the tree looked in their childhood and what was happening at that period of time, at the end of World War 2, rationing, different modes of transport and architecture all make interesting stories to illustrate and write about or even record.



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## Measurement and Ancient Trees

5. Name as many tree species as you can in three minutes.

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6. Thinking of the condition of a very old ancient tree, describe some of the features you would expect to find.

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7. Explain how the Woodland Trust is finding out about ancient trees and what they do with this information once they have received it.

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8. Describe some of the plants and wildlife that can be found living in an ancient tree.

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9. Why are trees important to our lives? Explain some of the reasons for this.

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10. Why are measurements and records of ancient trees important?

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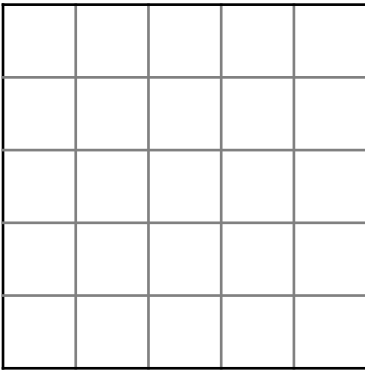


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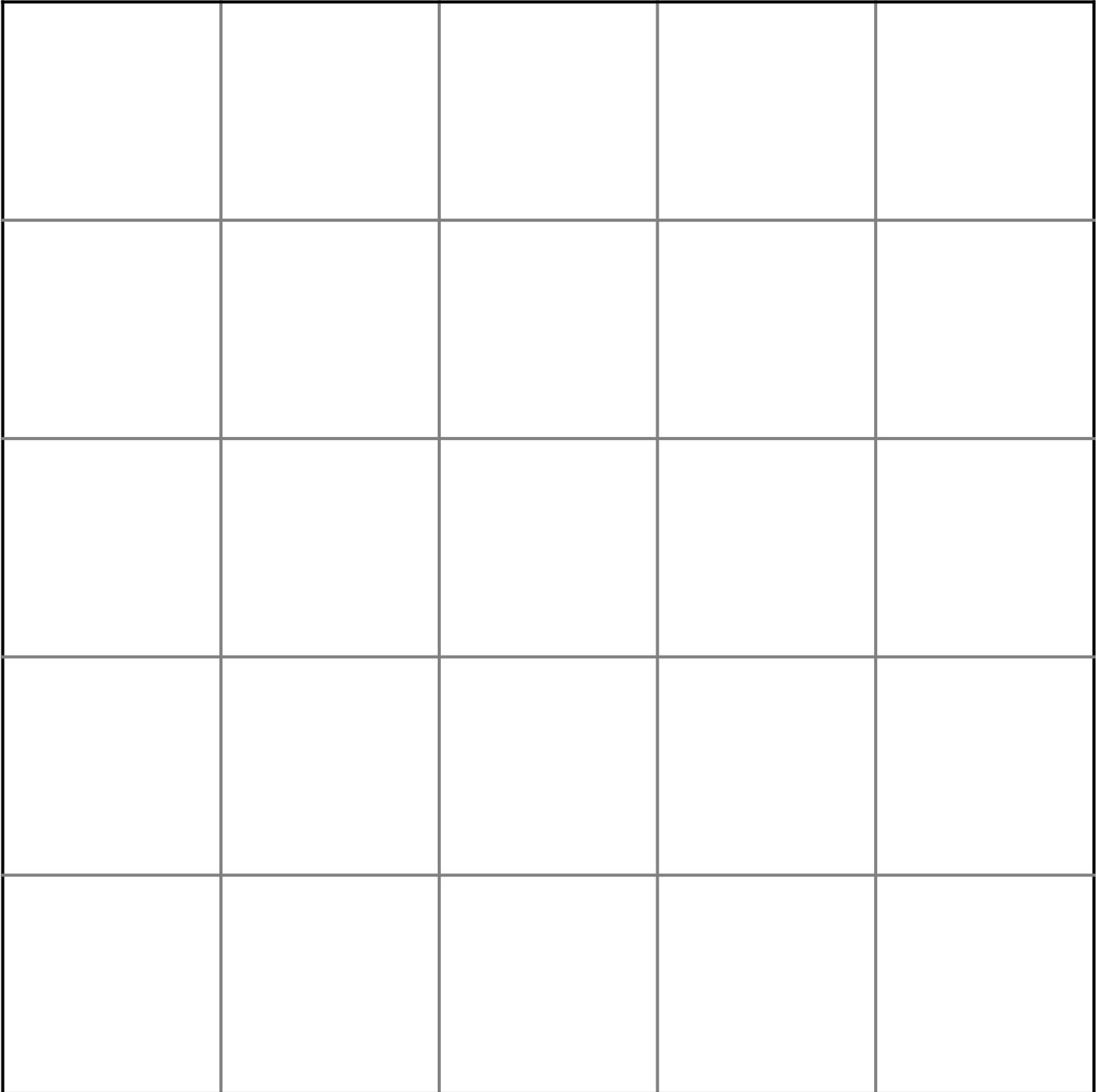
# KS3 Art and Design

## Measurement and Ancient Trees

### UNIT 3: STUDENT WORKSHEET 2



Use the small grid to position your leaf (or other object) and using the squares as guides enlarge and draw in detail the veins and textures onto the large grid. Use a magnifying glass to view fine details of the leaf.



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# The Ancient Tree Hunt

# KS3 Art and Design

## Measurement and Ancient Trees

### UNIT 3: TEACHERS ANSWERS to student worksheet 1

**1. How would you measure the height of a large tree? Give two examples.**

*Hint – Describe how you would pace out the position and measure this.*

**Answer** – A simple way is to stand at the base of the tree and then pace out in meters a straight line away from the tree, when a point is reached where the tree would miss you if it fell then that distance is roughly the height of the tree.

*Hint – What does a clinometer do?*

**Answer** – measures the height of trees and buildings.

**2. Give two ways of measuring the girth of a tree.**

**Answer** – Use a tape at about 1.5m from the base of the tree and measure the circumference.

**Answer** – Link hands and stretch around the tree with friends, measure the distance this covers.

**3. Explain the differences between these tree types a) a pollard b) a maiden c) a coppice.**

**Answer a)** A pollard has been cut above head height regularly for fuel and timber (This is to prevent deer and other animals reaching up to eat the new growth as the tree starts to shoot again).

**Answer b)** a maiden is a tree that grows straight upwards and has not been cut or pruned.

**Answer c)** A coppice is when trees are cut back to their base and then allowed to grow back again. An example is hazel and willow cut and used for hedging and other garden uses, quick growing and easy to maintain.

*Answers in more detail can be found on the Woodland Trust web site.*

**4. Explain how a grid can be used to enlarge the scale of a leaf.**

**Answer** – The leaf is taped on to a small grid (see grid worksheet) and then by carefully copying the perimeter of the leaf on to the large grid an accurate outline can be reproduced. (This is a good exercise in careful observation and technical skills and can be done with the aid of a magnifying glass to see more detail).

**5. Name as many tree species as you can in 3 minutes.**

**6. Thinking of the condition of a very old ancient tree, describe some of the features you would expect to find.**

**Answer** – Ancient trees are often hollow and have dying branches.

**Answer** – Often ancient trees are pollards stemming back to the time when the branches were cut for fuel and timber. (This tradition ceased about 100 years ago so a pollard is probably at least 100 years old and often much more).

**Answer** – Old trees have a wide variety of wildlife and plant life inhabiting it.

**7. Explain how the Woodland Trust is finding out about ancient trees and what they do with this information once they have received it.**

**Answer** – The Woodland Trust is building a national database of veteran trees and ancient trees to encourage conservation and protection.

They publish this on their web site in a large database, which can be seen by the public.

**8. Describe some of the plants and wildlife that can be found living in an ancient tree.**

**Answer** – There are many examples of different species of fungi, mosses and lichen, birds, squirrels and a wide variety of beetles and insects.

**9. Why are trees important to our lives? Explain some of the reasons for this.**

**Answer** – One mature tree provides enough oxygen to keep 8-10 people alive.

They keep our landscape attractive and healthy.

They are beautiful to look at and make us feel good.

They support many other species of life (One tree can support up to 1,000 species).

**10. Why are measurements and records of ancient trees important?**

**Answer** – Rather like a people census that tells us about the ages and distribution of people of different races so the same applies to our trees. There are no true records only estimates, by identifying different species and the locations, care can be taken to protect them and provide valuable information for conservationists in the future. New technologies such as web sites with databases provide much more access and solutions to these questions.



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### UNIT 3: TEACHERS SHEET

#### Written work or group oral work, session material

#### Discuss the following with your students;

- 1. Why are trees important to our environment? Discuss the reasons and what we can do to protect our environment.**

##### Answer

They provide oxygen and act as air purifiers absorbing carbon dioxide and pollutants.

They act as home for hundreds of species of birds, insects and mammals who in turn keep a balance in our countryside and towns.

We can protect our countryside by ensuring that we retain green spaces in towns and cities, preserve our woodlands and green fields and plant hedgerows and trees.

We can also recycle our waste materials.

- 2. Why are magazines so popular? What would be the key points required to produce a successful magazine? (This could include producing a magazine about trees and the environment).**

##### Answer

They cover a range of popular subjects and hobbies such as gardening, photography, homes and personalities.

Key points could be – good design and photography, interesting articles on specialist subjects, good writing and journalism, popular topics, informative and useful tips and an understanding of the readers needs.

This would be supported with advertising from companies with services and products that would be of interest to the readership. For example garden tools for garden magazines.

- 3. How would you plan a video story on ancient trees?**

##### Research

Research your subject and look for interesting sections (think of your video as a book – a title, introduction, a

series of chapters on specific topics and an ending).

Choose a team of people to write, take still images, draw, shoot video, narrate, make sound effects and recordings and edit the results.

- 4. What would you do to ensure you are designing a successful poster?**

##### Discussion

Ask why it is needed? For example to sell or advertise something.

Who is the audience you are trying to approach and persuade?

What type of images and words are required to make the poster creative and persuasive?

- 5. Write a short story on a period of time on an ancient tree in your locality (this could be between 50 and 300 years ago).**

- 6. Write a script to outline a story about why trees are important to insects and wildlife.**

- 7. Discuss interesting ways of taking photographs of ancient trees.**

##### Action

Create different perspectives by using wide angle or telephoto lenses.

Shooting through leaves or other objects to give depth to a photo, macro lenses to take pictures of small insects or plants such as fungi and lichen.

The use of people in the photograph to give scale to the size of an ancient tree.

- 8. Interview and record a local resident talking about an ancient tree in your locality. Use this as a podcast to put on the school web site.**



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