

The OPAL  
**Tree Health Survey**  
Booklet



For more information and to submit your data  
[www.opalexplornature.org](http://www.opalexplornature.org)



# Introduction

Trees are vital. They help combat climate change by capturing and storing carbon and act to reduce the impact of flooding and soil erosion. They provide income and support jobs through timber production and tourism. They are vital to wildlife too and provide a home and food for birds, insects and mammals.



Oak



Ash



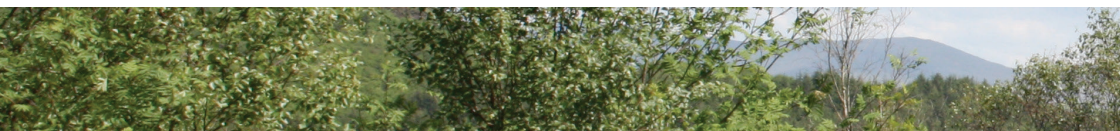
Horse Chestnut

However, our trees are under threat. The number of pests and diseases attacking them has increased in the last few years. Why has this happened? Two factors are thought to be important:

1. The increased trade in plants from around the world increases the risk of new pests and diseases entering the country.
2. Once here, insects may be able to survive our warmer winters and diseases may spread faster in wetter summer weather.

The Government has already acted to protect trees by supporting more research into tree pests and diseases, increasing precautions to keep pests and diseases out of the country, and working with local groups and networks that can help spot any new threats arriving in the UK.

The OPAL Tree Health Survey is about the condition of our trees. In recent years the number of pests and diseases attacking trees has increased leading to a decline in tree health and in some cases tree loss. In order to manage these problems most effectively we need to study our trees and record information about their condition and any pests and diseases that are found.



# Why do the Tree Health Survey?

By taking part in the OPAL Tree Health Survey and sending your results to us:

- You will help us to discover more about the general health of our trees and provide vital information on some of the pests and diseases that can affect Oak, Ash and Horse Chestnut.
- You may even spot one of the most feared pests and diseases which pose a serious threat to our trees.

Your results will be used by scientists and you will become part of the important surveillance network of people across the country protecting our trees.

## Pests and diseases

Pests are generally insects or small animals that harm plants or trees. Diseases, on the other hand, are caused by harmful microbes (pathogens), which include some types of fungi and bacteria. They are microscopic so you can usually see only the symptoms and not the cause. Many pests and diseases that affect our trees are common or widespread and their effects short-lived. This is especially the case for native pests and pathogens as their tree hosts have evolved at the same time and they have adapted to each other over thousands of years. Introduced pests can be much more damaging because the trees they encounter have not had the opportunity to develop resistance.

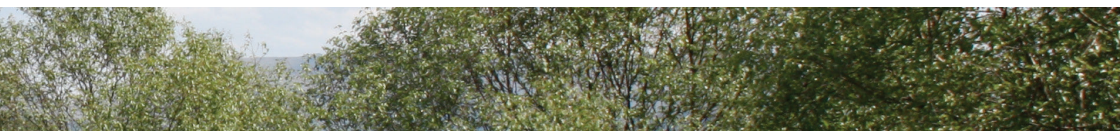


Horse Chestnut scale insect:  
a tree pest

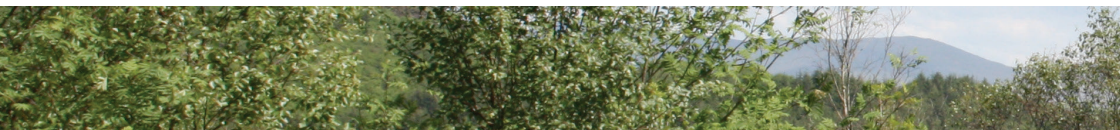
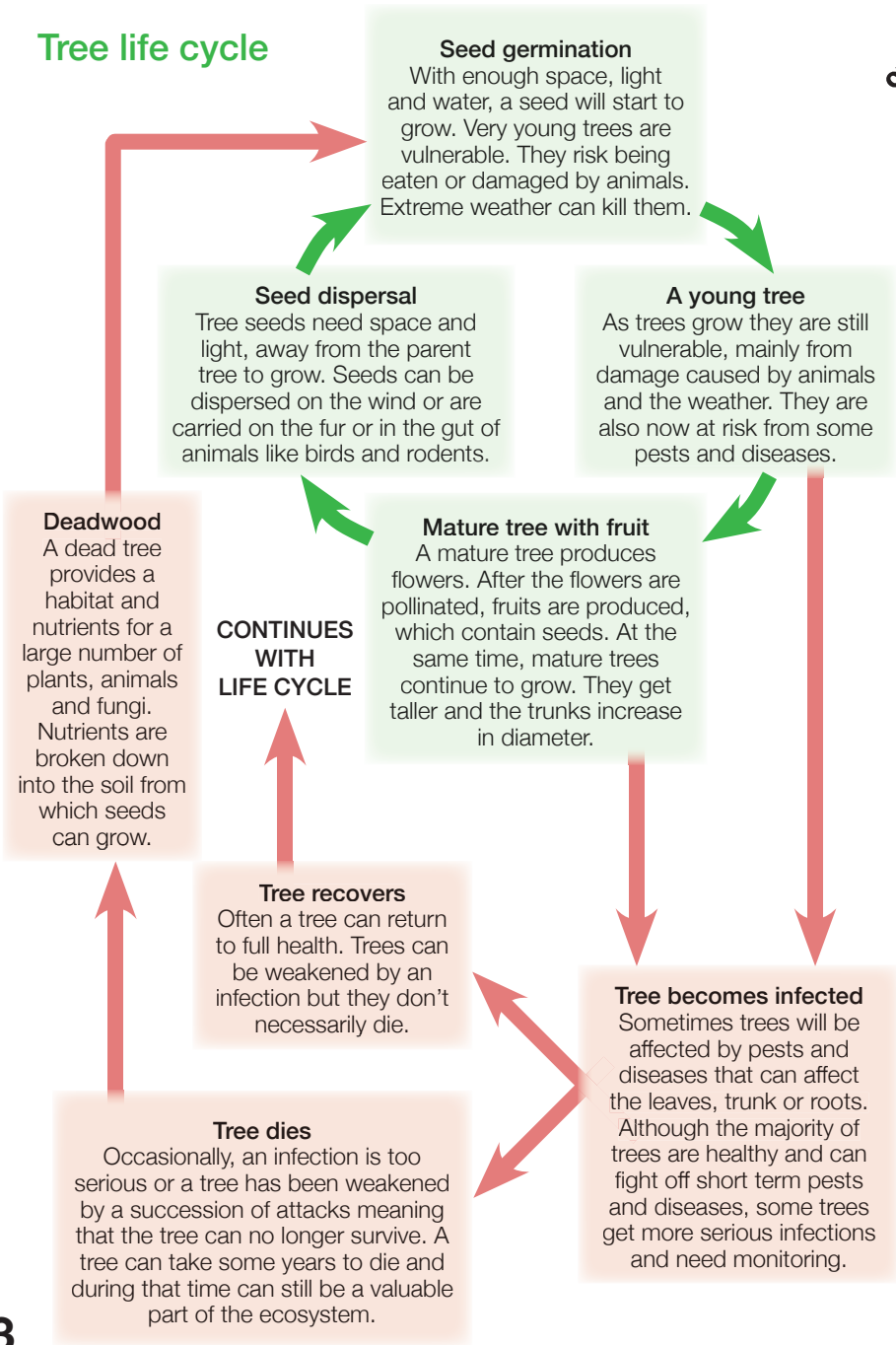
Collecting information on the pests and diseases that affect the UK's trees helps scientists understand their effects and distribution, and answer questions about whether changes in the levels of damage caused by specific pests and diseases are becoming more or less severe. It will also help researchers identify the extent to which specific trees or tree species are affected by multiple pests and diseases. Sometimes those that would only cause minor damage in a healthy tree can act together, making it weak and vulnerable, and even tipping it into decline.



Nectria canker on Ash:  
a tree disease



# Tree life cycle





# Survey preparation

There are three activities in the Survey:

**Activity 1:** Get to know your tree (pages 6-10)

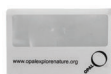
**Activity 2:** Pests and diseases on Oak, Ash and Horse Chestnut (page 11)

**Most Unwanted:** Serious threats to UK trees (page 12)

You can carry out the OPAL Tree Health Survey anywhere. All you need is safe access to one or more broadleaved trees, preferably Oak, Ash or Horse Chestnut. A **Tree Identification Guide** is included in your survey pack.

## Essential equipment to take outside with you

The **OPAL Tree Health Survey pack** which contains this survey **Booklet\***, **Tree Pest and Disease Identification Guide**, **Tree Identification Guide**, **tape measure** and **OPAL magnifier**.



## Useful items to take outside (if you have them)

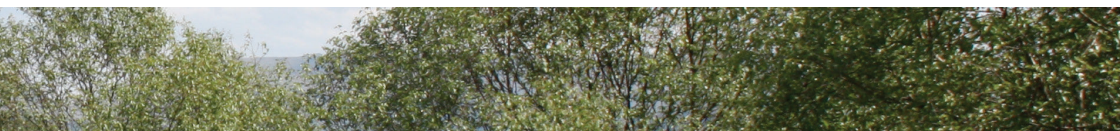
- A map or GPS device
- A mobile phone (in case of emergencies)
- A camera



When you see this symbol, you can take a photo and upload it to the OPAL website

This survey is best carried out when trees are in leaf from May to the end of September. Take care not to harm the environment during your survey.

\* You can download more recording sheets from the OPAL website.





## Safe fieldwork

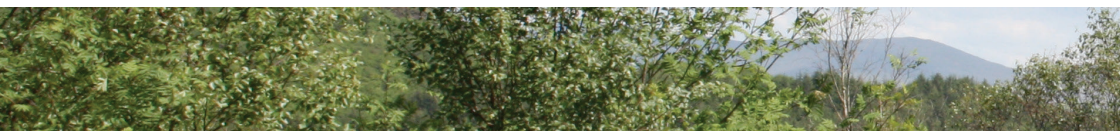
Trees and woodland in the UK are generally safe places, but you should take care. Use your common sense – it is your responsibility to be aware of the potential risks when carrying out any kind of fieldwork. Carry out a risk assessment if necessary.

- Dress appropriately for the weather and wear appropriate footwear. Check the weather forecast before you go outside. Do not do the survey in windy weather.
- Do not do the survey on your own. Take at least one other person.
- Make sure that you know what to do in an emergency. Carry a fully charged mobile phone in case you need to summon help and ensure you have good mobile coverage. Take a small first aid kit. Young children must be supervised.
- Avoid any trees with broken branches. Before you start the survey, check carefully from a safe distance for branches that are hanging off the tree and may fall. Check nearby trees too. You can report any dangers to your local council using [www.fixmystreet.com](http://www.fixmystreet.com)
- You do not need to climb trees for the survey. Do not climb on stacks of logs.
- Check the area for any signs of danger. Look out for any warning signs – pay attention to these signs and follow instructions where necessary. Look out for low hanging twigs and branches, uneven ground, tree stumps, dead wood and anything else that may cause trips and injuries. Watch out for prickly plants. Do not survey trees that are at the edge of a lake or river.
- Be aware of other activities going on around you. Take particular care if any forest operations, hedge trimming or tree surgery are taking place – it might be better to choose another site.
- Wash your hands thoroughly after doing the survey and especially before eating. A few plants, mushrooms and insects are poisonous or may cause rashes and skin irritation. The caterpillars of some moths can cause unpleasant allergic reactions, due to their toxic hairs, so any contact must be avoided. If you accidentally touch them, wash the affected area thoroughly, and seek medical advice if you experience a reaction.

It is important to look after the environment while you are out and about.

- Clean any mud and leaves off your footwear to avoid spreading pests and diseases next time you go out.
- Avoid disturbing any wildlife, including birds' nests.
- Leave the area as you find it and do not leave any litter behind.

More general safety information is available from Royal Society for the Prevention of Accidents [www.rospa.com/leisuresafety](http://www.rospa.com/leisuresafety)





# The survey starts here

## Activity 1: Get to know your tree

You can carry out the survey anywhere you like as long as you have permission to be there. All you need is safe access to one or more broadleaved trees (trees with wide leaves, not needles or scale-like leaves found on conifers). Activity 2 is for Oak, Ash or Horse Chestnut so select these trees first if possible, but you can survey any tree species in Activity 1. Remember to send your results to OPAL when you have finished.

### A Start surveying

1. Date of survey \_\_\_\_\_

2. Who are you doing the Tree Health Survey with today?

Primary school

Secondary school

Youth group

Adult volunteer group

Friends or family

College / university

Other

3. Are you involved in working with trees or forestry?

No

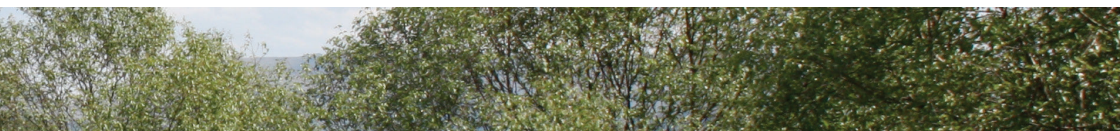
Yes, as part of a volunteer group or society

Yes, I work in the industry

4. Record the location of your site (postcode / grid reference / GPS reading).

Further help is available on the OPAL website if you are unsure of the exact location.

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5. Which of these best describes your survey area?



Street



Garden



School



Park



Open field



Hedge



Woodland edge



Inside woodland

Other (please specify) \_\_\_\_\_

6. What is the main ground cover at the base of the tree? Choose one option.



Grass or other plants



Bare soil



Hard surface (like pavement)



Fallen leaves

7. If there are fallen leaves beneath the tree, how many are there?



A few



A lot



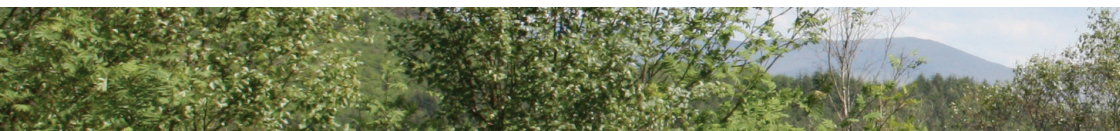
Ground is completely covered

## B Identification

8. Record the name of the tree (tree species).

You can use the [Tree Identification Guide](#) to help you.

\_\_\_\_\_





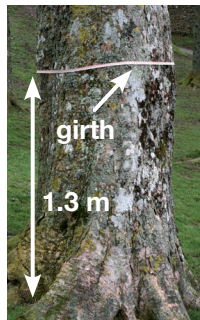
## C Tree characteristics

9. Measure the girth (circumference) of the trunk at 1.3 metres (130cm) above the ground.

girth = \_\_\_\_\_ centimetres

10. Measure the height of the tree. If your tree is too tall to measure safely from the ground, there are instructions on the back page of the this **Booklet**.

height = \_\_\_\_\_ metres



11. Is the tree taller or shorter than most of the other trees nearby?

Shorter than most

Taller than most

Same height as most

No other trees nearby

## D Crown

The **crown** is the leaf cover and branches at the top of the trunk (see diagram right). Walk away from the trunk to get a better view. Ignore any low branches beneath the crown. A healthy tree in summer has full leaf cover, however at any time during the year pests and diseases can cause twigs, branches and even the trunk to lose leaves and die.



12. Which of these best shows the shape of the tree?



Spreading



Oval



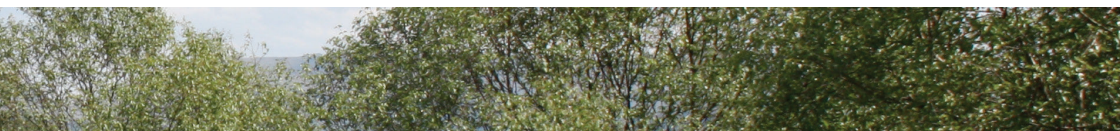
Fan



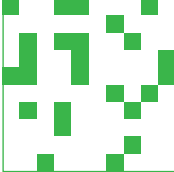
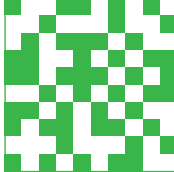
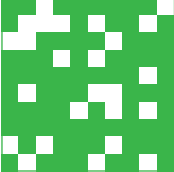
Column



Cone



13. Stand underneath the tree, next to the trunk and look up. How much of the view is made up of leaves? Choose the closest fit from the five options.

<p>only sky and branches visible</p>				<p>no sky visible</p>
<input type="checkbox"/> No leaves	<input type="checkbox"/> 25%	<input type="checkbox"/> 50%	<input type="checkbox"/> 75%	<input type="checkbox"/> All leaves

14. Can you see any dead wood (branches that have no leaves or twigs on them)?

No       Yes

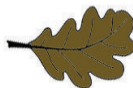
If YES, how much dead wood is there?

Less than a quarter of the tree       Between one quarter and one half  
 Between one half and three quarters       More than three quarters

## E Leaves

Leaves becoming brown or yellow before autumn is a sign that something is wrong. Leaf browning may be caused by many different factors including insects and sea salt. Leaf yellowing may be caused by a problem with the roots, and is often the sign of a longer term issue.

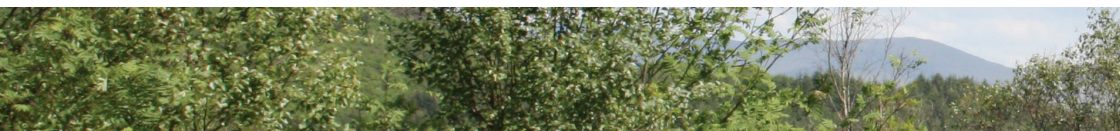
15. What types of leaf browning can you see? Tick all that apply.



Brown leaf edges     Brown spots     Leaves all brown     None

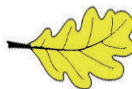
16. If there is leaf browning, how much can you see on the tree?

Less than a quarter of the tree       Between one quarter and one half  
 Between one half and three quarters       More than three quarters





17. What types of leaf yellowing can you see? Tick all that apply.



- Yellow leaf edges   
  Yellow spots   
  Leaves all yellow   
  None

18. If there is leaf yellowing, how much can you see on the tree?

- Less than a quarter of the tree   
  Between one quarter and one half  
 Between one half and three quarters   
  More than three quarters

19. Can you see any of the following signs of insect damage on the leaves?

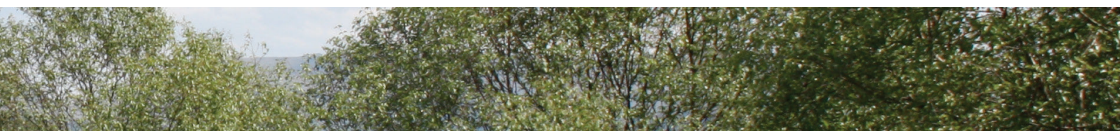


- Leaf holes: holes all the way through the leaf   
  Leaf mining: the upper and lower layers of the leaf are intact but the green tissue inside has turned brown or disappeared   
  Leaf galls: bumps and growths on leaves

## F Wildlife

20. It is useful to know how the tree supports biodiversity. Record any animals, signs of animal activity, plants or fungi.

- Birds or birds' nests   
  Squirrels  
 Animal burrows at the base   
  Insects  
 A large hollow in the trunk   
  Spiders  
 Moss / lichens / algae   
  Ivy  
 Fungi   
  Other



# Activity 2: Pests and diseases on Oak, Ash and Horse Chestnut



Activity 2 is about the pests and diseases of Oak, Ash and Horse Chestnut. If you looked at Oak, Ash and Horse Chestnut in Activity 1, please carry out Activity 2 on the same tree. Refer to the [Tree Pest and Disease Identification Guide](#) for photographs and more information.

Tick any that you see

## A Oak

Is this the tree surveyed in Activity 1?  yes  no



Oak mildew



Knopper gall



Tortrix roller moth



Oak decline

## B Ash

Is this the tree surveyed in Activity 1?  yes  no



Ash bud moth



Ash key gall



Nectria canker



Ash decline

## C Horse Chestnut

Is this the tree surveyed in Activity 1?  yes  no



Horse Chestnut leaf blotch



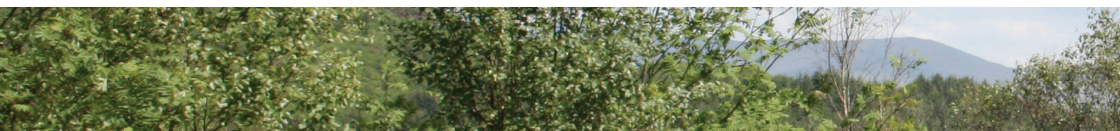
Horse Chestnut leaf-miner



Bleeding canker of Horse Chestnut



Horse Chestnut scale







# The Most Unwanted



Refer to the **Tree Pest and Disease Identification Guide** for photographs and more information.

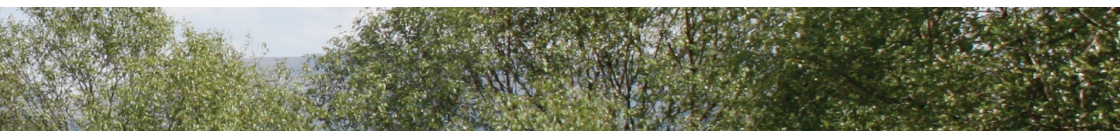
The Most Unwanted pests are covered by plant health legislation which means that if you find them you must notify government officials so that they can take any necessary action to control them. If you think you have found them (and there is more information on our website to help with identification) you must alert officials at the Forestry Commission directly, through:

- TreeAlert App: [www.forestry.gov.uk/treelert](http://www.forestry.gov.uk/treelert)
- Telephone: 08459 335577 (England and Wales),  
0131 314 6156 (Scotland) or 0300 200 7847 (Northern Ireland)
- For more information go to [www.forestry.gov.uk/forestresearch](http://www.forestry.gov.uk/forestresearch)

## Now send us your results

**It's really important that you send your results to us so that we can monitor tree health and track the spread of pests and diseases. Thank you for completing the survey.**

Enter results at [www.opalexplornature.org](http://www.opalexplornature.org)



# What do your results mean?

The results from the OPAL Tree Health Survey will tell us about the health and condition of trees in woodlands, parks, streets and other locations across the UK and provide important information about the possible presence of certain key tree pests and diseases.

A national survey like this has not been done so widely before, so your results will help us find out more about the current state of trees and woodland throughout the UK. It is likely you will collect information about individual trees that no-one has ever surveyed before.



Activity 1 is designed to collect information about the location, type, size, and condition of each tree. By looking closely at these aspects, your results will help us learn about the general health of your tree.



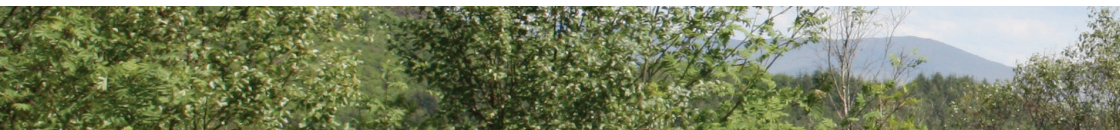
Collecting information about other species that may be living on or around the tree, including insects, birds and mammals, helps us to understand not just the health of the tree, but the health of the surrounding environment and habitats.

Activity 2 is designed to provide up-to-date information about pests and diseases that target three of our most recognisable tree species, namely Oak, Ash and Horse Chestnut. While these pests and diseases affect the appearance and condition of the tree, many of them do not generally pose serious threats to the species. Nevertheless we need to know

how frequently they are present and where they can be found to keep track of these tree problems. Importantly, some of the pests and diseases you might have spotted have the potential to cause more serious damage to trees, and in these cases the information you provide may be vital for protecting the future of our landscape.

This is why we also asked you to look out for the Most Unwanted – these are among the most serious threats to trees in this country and if you spotted any of those you will have provided some very important information.

For more information about tree health go to [www.opalexplornature.org](http://www.opalexplornature.org) or [www.forestry.gov.uk/forestresearch](http://www.forestry.gov.uk/forestresearch)



If you have enjoyed identifying plants and animals in this survey, you can get further help with identification on the iSpot website ([www.ispotnature.org](http://www.ispotnature.org)) where you can also share photographs of the plants and animals you have found.



This activity is one of a series of nature surveys developed by the Open Air Laboratories (OPAL) programme to help you get closer to your local environment while collecting important scientific data. With funding from the Big Lottery Fund, our network of leading universities, museums and wildlife organisations has been developing citizen science activities since 2007 and our resources are available throughout the UK.



If you've enjoyed this survey, why not try another? You can find everything you need to get involved at [www.opalexplenature.org/surveys](http://www.opalexplenature.org/surveys)

You can also see what your data has revealed so far and discover a range of ways to get more involved in studying the environment on our website: [www.opalexplenature.org](http://www.opalexplenature.org)



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Animal & Plant Health Agency

THE UNIVERSITY of York

EXPLORE WITH PLYMOUTH UNIVERSITY

Imperial College London

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LOTTERY FUNDED





## Measuring tree height

If your tree is too tall to measure with a tape measure, use this guide (Question 10). You will need two people.

- 1 The first person stands next to the tree.
- 2 The second person takes this guide and walks back away from the tree, holding the card at arm's length.



The top of the tree needs to line up with the top of the card and the bottom of the tree needs to line up with the bottom of the card.

- 3 When the person with the card is in position, they should guide the person at the tree to point at the trunk exactly at the level at the 10% mark shown at the bottom of this guide.



- 4 Once the person at the tree has found the correct point, use the tape measure to measure the height in metres of this point from the ground.

This will give you 10% of the height of the tree. Multiply this figure by 10 to work out the actual height of the tree.



If the tree is very tall, use the 5% mark on the side of this guide instead. Multiply this figure by 20 to work out the actual height of the tree.

10% —————

5% —————

Bottom of tree ↘