

CARFENEUNNOCK COUNTRY PARK

INVESTIGATING TREES WORKSHEETS

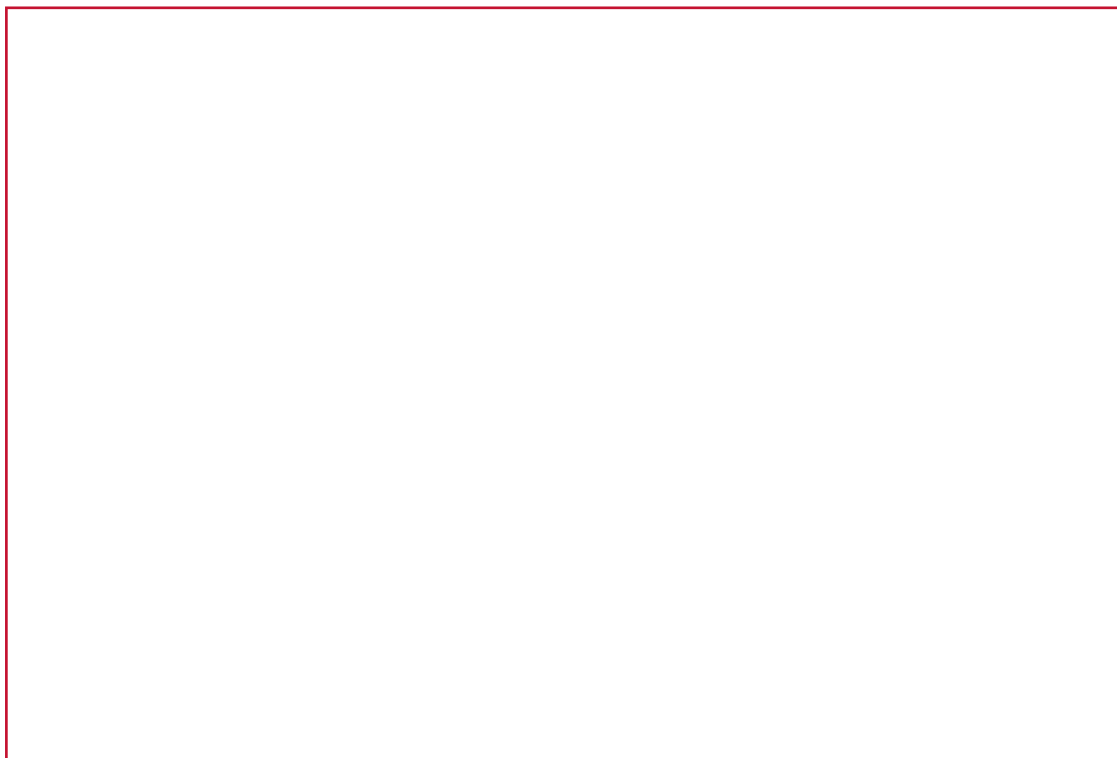
This project has been assisted by Causeway Coast & Glens Heritage Trust as part of the Natural Resource Rural Tourism Initiative under the EU Programme for Peace and Reconciliation.

WORKSHEET 1: KNOW THE PARTS OF A TREE

1

A tree has three main parts: **root**, **trunk** and **crown**. The root is the part that grows in the ground; the trunk grows above ground and the crown grows out of the trunk and is made up of branches, twigs, leaves, buds, flowers and fruit.

Select a **MATURE TREE** within Carnfunnock Country Park. **Look closely at your chosen tree and draw an outline of its shape then label its parts using the word bank:**



Word Bank:

1. Trunk
2. Leaf
3. Bark
4. Branch
5. Twig
6. Root
7. Crown
8. Wood

What time of year is it?

Are the leaves on different parts of this tree all the same size and shape?

What else would you expect to add to this drawing?

In spring / early summer?

In late summer / autumn?

Now using the same tree move on to Worksheet 2 to find out more information about it.

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WORKSHEET 2: WHAT KIND OF TREE IS IT?

2

The first step in tree identification is to know that there are always distinguishing characteristics that separate one tree species from another. By examining different tree parts you will be able to identify the many species of trees that can be found around Carnfunnock Country Park. This will require some careful detective work!

CLUE 1: TREE SHAPE / FORM

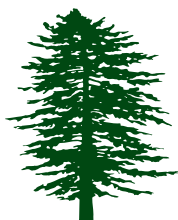
The shapes of trees reflect their species and way of life. The trees in Carnfunnock grow mainly in the following different shapes, which can help you to recognise them.



ROUNDED
Broad & wide crown
e.g. Oak, Sycamore, Ash



OPEN OR FLAT-TOPPED
Side branches die & crown flattens e.g. Scots Pine



LOZENGE-SHAPED
Broad in middle & pointed at top
e.g. Alder, Pines



TRIANGULAR OR PYRAMIDAL
Layers of branches, decreasing in length e.g. Spruce, Giant Sequoia



DROOPING OR WEEPING
Downward branches
e.g. Silver Birch, Weeping Willow



CONICAL
Shaped like a cone or broad at base, tapering to a narrow top e.g. Young pine trees such as Scots and Austrian Pine



COLUMNAR
Side branches are same length - more tall than broad e.g. Irish Yew

Which shape of tree did you choose for Worksheet 1?

Where did you find this tree growing i.e. middle of a forest or out in the open?

Do you think this tree's shape has been affected by its surroundings? Yes / No (Please circle)

Why?

For example:

- trees growing in windswept areas can be shaped by the wind as it can dry out their buds on one side so they shrivel and die;
- trees hemmed in by neighbours in woodlands have to grow tall to reach the light and often only their highest branches will bear leaves; and
- trees growing in the open do not have to struggle to reach the light and instead of being tall and thin may be broad and round.

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CLUE 2: TYPE OF TREE

2

In Northern Ireland trees can be divided into 2 main groups. Can you find examples of each type?

Type One: Coniferous (Softwood) Trees (often called Ever Greens)

1. Conifers have leaves like needles or tiny scales. These leaves are tough and waxy and leaf-eating animals generally cannot eat them.
2. The shape of a conifer is usually upright and conical.
3. Conifers do not have true flowers - instead they produce cones in which seeds develop.
4. Conifer leaves can stay on a tree all winter because they are tough and not easily damaged by frost. These trees do not shed their leaves in the autumn and are called **ever greens**. The only exception is larch which is the only conifer to shed its leaves.

Examples of Coniferous Trees:

1.

2.

3.

Type Two: Broadleaved (Hardwood) Trees (Dicotyledons)

1. Broadleaves are so called because their leaves are wide, thin and flat, as if they were cut out of paper. There is a great variety of leaf shape and size.
2. The shape of a broadleaf tree is usually rounded at the top.
3. Broadleaved trees all produce flowers which develop into seeds. The seeds are often enclosed in a hard nut or a fleshy fruit.
4. Most broadleaved trees are deciduous, i.e. they shed their leaves every autumn. The main exceptions are holly and laurel.

Examples of Broadleaved Trees:

1.

2.

3.

Can you think of any trees in Carnfunnock that do not belong to either of these groups?

Clue: They look a bit tropical, have long sword like leaves and grow on one long trunk with no branches!

Which type of tree is your chosen tree?

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CLUE 3: BARK

Each tree has its own unique bark, just like we have our own fingerprints. To identify a tree by its bark, you have to look at its texture, colour and pattern. Some trees, like Beech have smooth bark. Others like Oak have rough bark. Some bark sheds in strips or flakes like that of the Yew or Silver Birch. Bark can also be scaly or flaky as on the Scots Pine. A tree's bark may also have shallow or deep grooves depending on the species.

Experiment 1: Try feeling the bark of your chosen tree with your eyes closed then describe how it feels.

Experiment 2: Tape this sheet to the bark of your tree. Use the long side of a crayon to gently rub over the surface. This should pick out the texture of the bark underneath. If you can't see the texture coming through, rub a bit harder.

Describe it.

Compare your bark with others from the class and see what differences you can find.

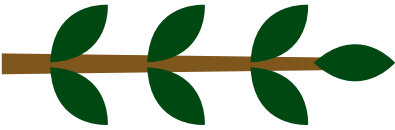
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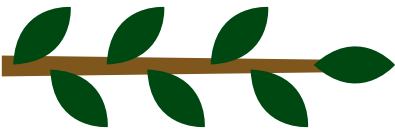
CLUE 4: TWIGS & BUDS

Trees have either opposite buds or alternate buds. For example:

A. Trees with buds opposite: Ash, Sycamore, Horse Chestnut and Field Maple.



B. Trees with alternate buds: Oaks, Beech, Alder, Lime and Birch.



The buds can differ in: colour, texture (scaly, hairy, thorny, smooth or even sticky) and can occur singly or in clusters. They can even grow at an angle to the twig or close to the twig.

What sort of buds and twigs does your tree have? Describe them.

CLUE 5: LEAVES

Leaves are the most important part of a tree as they use sunlight energy to convert water and carbon dioxide into plant 'food', sugars and starches, which can be stored. Oxygen then passes back into the atmosphere. This process is known as **photosynthesis**.

Broad leaves come in all different shapes and sizes: triangular, round, long, heart-shaped, oval, lobed, hand-shaped, feather-like, maple like or very unusual shapes. Conifer leaves can be divided into those that are needle-like e.g. Pines, Larches and those that resemble scales e.g. Monterey Cypress, Cedars.

Each of the seasons sees dramatic changes in: temperature; water supply; food supply and sunlight. This means most organisms have to **adapt** to these changes in order to survive. In winter there is less light and water available for some trees to make food. So they have learned to adapt each autumn.

How do deciduous trees adapt each autumn?

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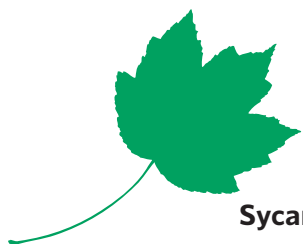


CLUE 5 (cont): TYPES OF BROAD LEAVES

2

There are 2 types of broad leaves:

1. **Simple:** the leaf blade is **not** divided into leaflets.



Sycamore



Oak

2. **Compound:** the leaf blade **is** divided into leaflets



Ash



Horse Chestnut

Leaves can also be either:

- a. **Pinnate:** Leaves have a central mid vein (midrib) with side veins arising from it.



Oak - a pinnate simple leaf



Ash - a pinnate compound leaf

- b. **Palmate:** Leaves have several main veins.



Sycamore - a palmate simple leaf



Horse Chestnut - a palmate compound leaf

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CLUE 5 (cont): SHAPES OF LEAVES

Now look closely at the leaves below and write down the correct tree name from the word bank. Remember to circle 1 if you think it is a simple leaf, 2 if you think it is a compound leaf, and 3 if you think it is a needle. Then try to see if you can find these trees in Carnfunnock.

2



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



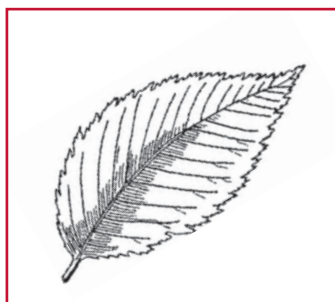
Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	



Tree:

1	2
3	

Word Bank

Alder

Ash

Beech

Elm

Horse Chestnut

Lime

Oak

Rowan (Mountain Ash)

Scots Pine

Silver Birch

Sycamore

Yew

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CLUE 5: (cont): LEAF INVESTIGATION

Collect a leaf from your chosen tree and look at it closely.

Do a rubbing of the leaf in this box (or use a separate sheet).

What colours can you see in your leaf?

Draw the shape of the leaf and show its vein pattern in this box.

How long is your leaf? cm


How wide is your leaf? cm

What does your leaf feel like?

What does your leaf smell like?

2

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CLUE 6: FLOWERS

All trees have flowers. Flowers are a tree's reproductive organs: some are male, some are female and some are both.

Pollen from the male flowers is carried by insects or by the wind to pollinate the female flowers. These then grow into fruit-bearing seeds or cones. Trees that produce flowers with petals are pollinated by insects e.g. Hawthorn, Crab Apple, Cherry, Rowan. Others have no need to produce petals to attract insects and are pollinated by the wind e.g. Ash, Birch, Beech, Oak, Elm, Hazel.

See if you can find a flower on your chosen tree. Look at it carefully and answer the following questions.

Does the flower appear before or after the leaves?

What colour(s) is the flower?

Are there one or two types of flowers on your tree?

Does the flower grow singly or in clusters?

How big are the flowers?


How do you think the pollen from your tree is spread around?

How does the flower smell?

Draw a picture of your flower?



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CLUE 7: FRUIT

2

Like all plants, a tree begins from a seed. Inside each seed is a tree waiting to be born! A seed must have food, water and light to grow. Once the seed sprouts, it grows into a seedling that grows into a sapling and eventually saplings grow into trees that produce their own seeds.

If a tree's seeds simply fell and grew beneath the parent plant then they would be too overcrowded and would be starved of nutrients. It is therefore very important that the seeds are dispersed over a wide area where they stand a better chance of finding the right conditions to grow.

The wide variety of fruit shapes makes them useful when identifying trees. Animals and wind have an important role to play in seed dispersal. Some animals carry the seed from place to place on their fur while others eat the fruit and carry the seed inside them only to disperse it in their droppings.

Find a fruit or seed from your chosen tree. Look at it carefully and answer the following questions:

What colour is your fruit?

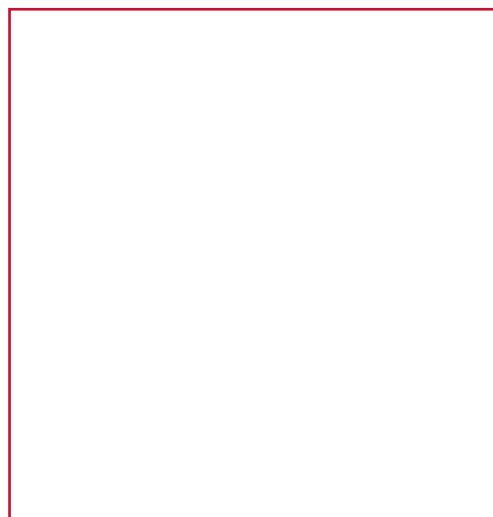
Is the fruit a berry, nut or seed?

Does the fruit have hooks, hairs, wings or an external casing?

Is the fruit juicy or hard?

Squeeze to find out. Don't try and eat it - it may be poisonous.

Draw a picture of your fruit.



How do you think the seeds of your tree are spread around?

What animals do you think eat nuts and berries?

At what time of the year would birds and animals need nuts and fruit the most?

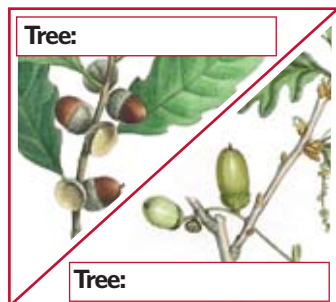
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CLUE 7 (cont): FRUIT IDENTIFICATION

See if you can match the fruits below to the trees in the word bank then identify whether you think they are carried by the wind, animals/birds or water:

2



Dispersal by:



Dispersal by:



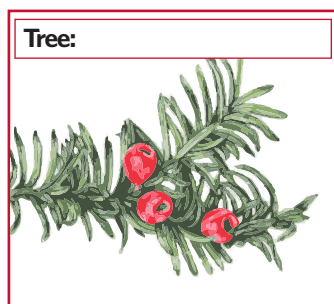
Dispersal by:



Dispersal by:



Dispersal by:



Dispersal by:



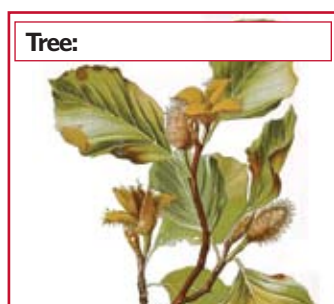
Dispersal by:



Dispersal by:



Dispersal by:



Dispersal by:



Dispersal by:



Dispersal by:

Word Bank

Alder	Ash	Beech	Elm	Horse Chestnut
Lime	Oak	Rowan (Mountain Ash)	Scots Pine	Silver Birch
Sycamore	Yew			

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CONCLUSIONS: GUESS THE TREE

2

Now it's time to add up all the clues for your specific tree and figure out exactly what it is!

What is the shape of the tree? (Clue 1)

Is it a conifer or broadleaved tree? (Clue 2)

How tall is it?

How old might it be?

Was it planted or did it grow by chance?

What is its bark like - rough, smooth, lined, lumpy? (Clue 3)

What are its twigs / buds like - alternate or opposite? (Clue 4)

What is its leaf like? Is it compound, simple or needle-like? (Clue 5)

What are its flowers like? (Clue 6)

What are its seeds or fruit like? (Clue 7)

Using all this information, what kind of tree do you think it is?

Now look up our publication 'Tree Spotting at Carnfunnock Country Park' and see if you are right!

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WORKSHEET 3: WOODLAND HABITAT

3

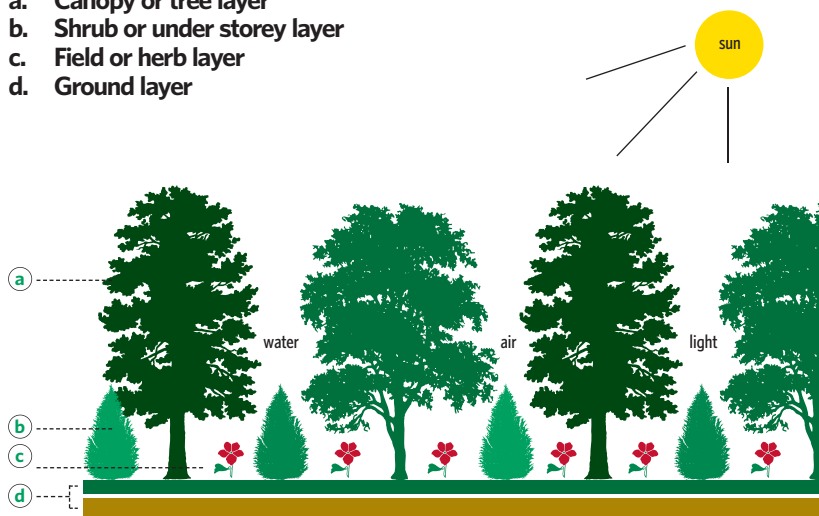
Our young saplings are just as important as old mature trees, if the woodland is to survive in the future.

Trees can be important for wildlife, especially mammals, birds, invertebrates, and lichens. Native trees such as Oak and Willow support more wildlife than non-native trees such as Sycamore. Trees not only give shelter to birds and wildlife, they provide food, nesting sites and "green corridors" for wildlife to travel from one habitat to another. Fallen leaves add nutrients to the soil and dead wood can be especially important for invertebrates (and for the birds which feed on them).

Trees and other plants are primary producers: they produce food in their leaves by photosynthesis, using energy from sunlight to combine carbon dioxide from the atmosphere with water from the ground to make sugars. These sugars are the beginning of the food chain on which all other forms of life depend.

Below is a picture of a woodland environment - can you identify what plants you would expect to find growing in each layer?

- a. Canopy or tree layer
- b. Shrub or under storey layer
- c. Field or herb layer
- d. Ground layer



a. Canopy or tree layer?

b. Shrub or under storey layer?

c. Field or herb layer?

d. Ground layer?

Each of these layers is an important habitat. Look for animals and invertebrates such as hedgehogs, spiders and butterfly pupae. Look for signs of animals such as partly eaten leaves, galls, spiders' webs, snails' shells or trails, footprints and nests.

Select a tree and see what animals or mini beasts you can find on:

The Leaves:

The Branches:

The Trunk:

Ground/Leaf Litter:

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Woodlands contain a great variety of animals and insects. Can you match the woodland creature to its food?

WILDLIFE

Badger



Fox



Bat



Butterfly



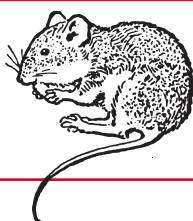
Sparrow Hawk



Woodlice

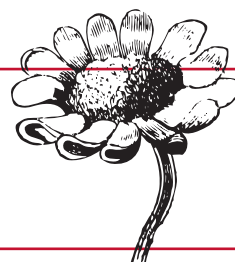


Wood Mouse



FOOD

Nectar



Small Birds



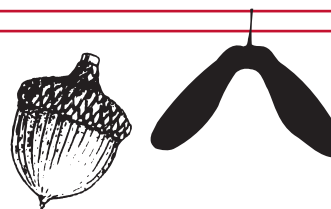
Rabbits



Earth Worms



Seeds



Moths



Dead Wood



WORKSHEET 4:

IMPORTANCE OF TREES TO PEOPLE

4

Products are derived from all parts of a tree: the wood, gum, tree resin, fruits, leaves and bark. The development of human civilization has been dependent on wood based technologies. Where would we be without fire, agriculture, the wheel, spinning, weaving, building, printing, water and land based transport?

Neolithic settlers first entered Northern Ireland around 7,000 years ago and began to clear small areas of forest for timber and farmland. Even around 1600 AD dense forests still covered large areas on the north-west and south sides of Lough Neagh and along the Bann, Erne basin, Lagan Valley and East Antrim Coast. When industry began to expand from 1600 AD onwards, wood was required for ships, barrels, housing and charcoal. Bark was also needed in large amounts for tanning leather. By 1800, commercial exploitation of woodlands had cleared most of our once extensive forests. With increasing pollution, trees have an important role in improving the quality of the air that we breathe, through removing carbon dioxide, releasing oxygen and filtering pollutants.

As you walk around Carnfunnock Country Park identify ways in which you can see trees being used by people then list them below:

1.		6.	
3.		4.	
5.		6.	
7.		8.	
9.		10.	

Which ones are the most important in your life? Why?

Today, less than 8% of Northern Ireland is wooded, which is lower than many of our European neighbours. Why do you think this is?

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WORKSHEET 5: CONSERVATION OR DESTRUCTION

5

The key to understanding trees is to treat them as living organisms, struggling for survival in a hostile world. During the last 50 years, 45% of ancient semi-natural woodland in the United Kingdom has been cleared or converted to plantations, and more than 30 million trees have been killed by Dutch elm disease. The statements below could be used to support the preservation or destruction of trees and woodlands. **Decide which side of the argument each statement belongs to and then write the letter in the correct box.**

- | | |
|--|---|
| a. Provides oxygen for breathing; | k. Use of wood for burning; |
| b. Lets more light into buildings; | l. Prevents soil erosion; |
| c. Clears land for crops; | m. Makes ploughing etc. difficult; |
| d. Provides habitat for birds and insects; | n. Provides produce (apples, cherries etc.) |
| e. Dead leaves provide nutrients for the soil; | o. Provides food for animals; |
| f. Increases risk of flooding; | p. Lowers carbon dioxide in the air; |
| g. Makes space for roads and houses; | q. Improves air quality by filtering out harmful pollutants |
| h. Use of wood for making furniture; | (such as ozone, ammonia, sulphur dioxide, nitrous |
| i. Provides chemicals for medicine; | oxides and dust particles). |
| j. Provides shelter for large mammals; | |

REASONS FOR CUTTING DOWN TREES

REASONS FOR KEEPING TREES

Can you think of any more reasons? List them below.

REASONS FOR CUTTING DOWN TREES

REASONS FOR KEEPING TREES

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WORKSHEET 6: EXOTIC TREES

6

Imagine you are a famous world explorer for the day. You are about to set off on a quest to find new and interesting tree species. You don't have to travel to far away countries to discover strange and exotic trees. You can find them in Carnfunnock Country Park, if you know where to look.

The Monterey Cypress, Cabbage Tree and Pissards Plum are not trees that are native to Northern Ireland. The Monterey Cypress comes from North America. The Cabbage Tree is from New Zealand and the Pissards Plum originates from Iran.

How did these exotic and mysterious plants come to be in Carnfunnock?

These species are mainly found in the grounds around the Wildlife Garden. This part of the Park was originally owned by Lady Dixon's family (1878 - 1947). Lady Dixon was a great plant collector and many of these exotic species were gifted to her or brought back from her travels abroad.

GROUP ACTIVITY

Now divide up into 3 groups. Each group should take one of the exotic tree worksheets and imagine that someone wants to chop down their particular tree, because it is not native. You have to start a campaign to save it. Consider in your group answers to the following questions:

1. What makes your particular tree special?
2. Why do you think it has been planted in Northern Ireland?
3. Why should people want to save it?
4. How long do you think it has been here?
5. If it were to die naturally, would you replace it or plant a native species?



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TREE 1: PISSARDS OR CHERRY PLUM

6

Use these clues to find this tree:

Shape: Rounded crown with spreading branches up to 10 metres tall.

Tree Year: Flowers (March) then leaves; Fruit ripens (August / September); Leaves fall (October)

Leaves: Dark red young foliage, later turning to a deep purple, oval leaf 65mm in length. This is covered with downy hairs along the midrib and veins. The leaves fall in autumn, often turning a paler purple or reddish colour first.

Flowers / Fruit: Flowers are pink in the bud and white on opening. They are produced both singly or in twos or threes creating dense clusters. Fruits are not often produced but when present are smooth dark purple berries about 25mm in size.

Find a Pissards Plum tree and draw its shape and leaf.

Pissards Plum from Iran

Find out 3 interesting facts about the country it came from:

1.

2.

3.

Tree Shape

Leaf Shape

INTERESTING FACTS

These trees carry the name 'Pissards Plum' after the gardener who discovered it in 1880. As the story goes Monsieur Pissard, the French head gardener to the Shah of Persia found a branch with purple leaves on a Cherry Plum tree growing in the Shah's garden at Tauris, near Teheran, Persia. Cuttings were then introduced to France and over the last 130 years a lot of breeding and selection work has been carried out to improve the characteristics of the plant. Today, there are dozens of varieties of purple-leaf plum trees that have longer-lasting colour (the early trees tended to turn a bronzy-green in the summer) and improved disease resistance.

There are many types of plum trees and they are usually grouped by their place of origin. There are American, European, and Japanese species, all of them appreciated for their flowers, leaves and fruit.

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TREE 2: CABBAGE TREE

6

Use these clues to find this tree:

Shape: Grows up to 20 metres tall at first on a single stem, but as it matures it divides into a much-branched crown; each branch forking after producing a flowering stem.

Tree Year: Evergreen: Flowers (June - July); Fruit (October)

Bark / Twigs: Rough tan bark, flares at base.

Leaves: The light green arching leaves are sword-shaped, 0.5 - 1 metre long with numerous parallel veins. New leaves grow continually from the centre, taking the tree upwards. The older leaves at the bottom die back and hang down.

Flowers / Fruit: In mature trees the flowers are creamy white and produced in large, dense clusters. Each flower is small, about 1cm in diameter. The fruit is a bluish white berry, 5 - 7 mm in diameter.

Find a Cabbage tree and draw its shape and leaf.

Cabbage Tree from New Zealand

Find out 3 interesting facts about the country it came from:

1.

2.

3.

Tree Shape

Leaf Shape

INTERESTING FACTS

Robinson Crusoe's role model, Alexander Selkirk ate cabbage tree leaves when he was marooned on the Juan Fernández Islands in the eighteenth century. They can be made digestible by cooking and were a valuable food source for the Maori people for at least 800 years. Archaeological digs have discovered huge hollows, up to 7 metres across which were the remains of "umu-ti" (cabbage-tree ovens). After cooking for 2 days, the bundles of young cabbage tree leaves would be sun-dried, in which state they would keep for years.

Cabbage trees also have value as fibre sources. The trunk and root material can be twisted into ropes, and the leaves can be woven for clothing and footwear fabrics. Juice from the plant can help fight infections. The commercial value remains to be fully exploited.

Possibilities are as a low-calorie sweetener since it is twice as sweet as sugar. It is also planted worldwide as an ornamental tree because it tolerates colder weather. Since 1987, cabbage trees in New Zealand have been affected by a disease, known as 'Sudden Decline' which usually leads to almost total loss of leaves within 2 - 12 months.



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TREE 3: MONTEREY CYPRESS

6

Use these clues to find this tree:

Shape: Massive spreading tree up to 40 metres tall living for up to 300 years. When young, it has a narrow, erect outline and a pointed crown but broadens as it grows older and can be shaped by the wind.

Tree Year: Evergreen. Flowers (April - June); Cones (All year).

Bark / Twigs: Brown, ridged and broken into scales. Spiky looking twigs.

Leaves: Yellowish lemon-scented scaly leaves which are 1mm long with branchlets pointing forwards.

Flowers / Fruit: The small, yellow egg shaped male flowers shed their pollen. Females develop into rounded brown cones up to 4 cm across with lumpy leathery scales. After shedding their seeds the cones often remain on the tree.

Find a Monterey Cypress and draw its shape and leaf.

Monterey Cypress from
California, USA

Find out 3 interesting facts
about the country it came from:

1.

2.

3.

Tree Shape

Leaf Shape

INTERESTING FACTS

This tree was introduced to Britain in 1838 from West California, USA. It is used extensively for bonsai. The twisted form that makes bonsai attractive comes naturally to Monterey cypress. Monterey cypress is very salt-tolerant and has been used for seaside plantings, where it develops a striking windswept shape. It is often grown in a group to create a windbreak or screens, and can be pruned to form a hedge. Monterey Cypress is nearly extinct in the wild. Its huge root system and dense canopy competes with native plants for water and sunlight. It grows best in areas with mild climates, winter rain, and cool ocean breezes as an ornamental tree and occasionally as a timber tree. When planted in areas with hot summers such as central California it has proved highly susceptible to cypress canker, caused by the fungus '*Seridium cardinale*', and rarely survives more than a few years;

this disease is not a problem in areas where summers are cool. Its timber was used for fence posts before electric fencing became popular. Sawn logs are used by many craftspeople and small manufacturers for furniture and decorative wood because of its fine colours.

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