

LCA



EDUCOOT

Agriculture Forestry

Student Worksheets

SAMPLE!

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CONTENTS

Unit 1: The forestry industry in Ireland

A. What is forestry	Page 7
B. Forestry in Ireland	Page 8
C. Forestry and the law	Page 17
D. Agroforestry	Page 19
E. Forestry products	Page 20
F. Forestry hazards	Page 26
G. Forest fires	Page 34

Unit 2: Common forestry trees and their biology

A. Deciduous and evergreen	Page 37
B. Tree identification	Page 38
C. Types of trees	Page 46
D. Principal features of plants	Page 49
E. The age of the tree	Page 63
F. Tree seeds	Page 65
G. Propagating a tree from seed	Page 69
H. Measuring the girth and height of a tree	Page 71

Unit 3: Climate, site selection and multiple land use

A. Weather station	Page 74
B. Effects of climate	Page 76
C. Site requirements	Page 79
D. Conflict in competing land use	Page 80
E. Forest recreation	Page 81
F. Effects of forestry	Page 84



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A. WHAT IS FORESTRY?

According to the Collins Dictionary:

Forestry is the science or skill of growing and taking care of trees in forests, especially in order to obtain wood.

What words come to mind when you hear the word 'forestry'? Write them below:

At the end of the course, come back to this list. Add some new words.

Read some forest facts:

- * A large area filled with many trees is called a forest.
- * Forests are found on almost every continent in the world.
- * Not only are they beautiful, but they provide shelter for animals and wood for humans.
- * Forests also clean the air.
- * Some forests are plantation forests. These are forests that have been planted by tree farmers. The plantations supply much of the wood humans use.
- * Some forests have evergreen trees, such as pine trees. These trees don't lose their leaves, or needles, in the winter.
- * Deciduous forests have trees that lose their leaves in the fall. These trees have four layers - very tall trees like oaks, smaller trees and saplings, shrubs and bushy plants, herbs and small ground plants and finally the ground layer, which includes mosses and lichens.





B. FORESTRY IN IRELAND

1. Read:

* The forests of Ireland are very diverse, ranging from commercial plantations to native woodlands, to trees and woods in and around our towns and cities. The benefits from Ireland's forests include timber production, employment, biodiversity, wildlife conservation, environmental protection, rural development, carbon sequestration, amenity and recreation, and tourism.

* Although there is overlap between the types of forests, the forests of Ireland can be roughly divided into five basic types:

* upland and peatland forests

* farm forests

* native woodlands

* amenity forests

* urban forests



* The government aims to increase forest cover to 15% by 2030 and to include 30% broadleaves and a 20% mix of conifers. Schemes have been set up to help regenerate the native woodlands.

2. Look up the meanings of the underlined words in the text above:

a) diverse

b) biodiversity

c) rural development

d) carbon sequestration

e) recreation

f) woodlands

g) urban forests

h) broadleaves

i) conifers

j) regenerate



3. Read:

- * The area of forest is estimated to be 770,020 ha, or 11% of the total land area of Ireland (National Forest Inventory 2017).
- * Forest cover is estimated to be at its highest level in over 350 years.
- * Of the total forest area, 391,357 ha or 50.8% is in public ownership, mainly Coillte.
- * The forest estate is comprised of 71% conifers and 29% broadleaves.
- * Nearly three-quarters of the stocked forest area is less than 30 years of age.

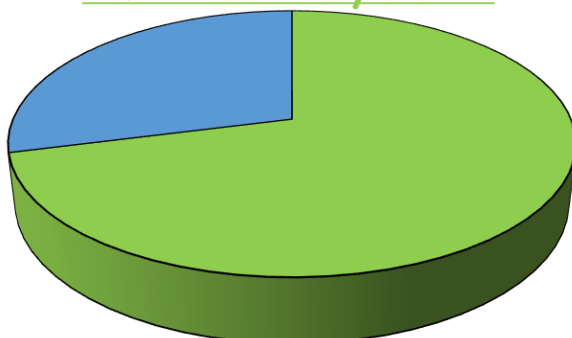
Source: <https://www.gov.ie/> Last updated on 2 September 2022





Aerial view of a dense spruce forest in the Wicklow Mountains at the foot of the 757m peak called Kippure

4. Write the labels: **Broadleaves** and **Conifers**

The Forestry Area



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13. Read about Teagasc:

Teagasc's Forestry Development Department gives advice, training and research on farm forestry and related matters. It provides a wide range of services for all forest owners. The services are free, objective and independent.

Supported by on-going Teagasc research, these services include:

- * one-to-one advice
- * local and national demonstration events
- * a wide range of information both online and in print
- * technical training

Advice given by Teagasc includes:

- * Establishment of new forests
- * Management of forests, e.g., inspection paths, roads, shaping, pruning, alternative management systems and nutrient requirements
- * Timber harvesting, e.g., harvesting and selling of timber, selecting potential crop trees, thinning of conifer and broadleaf forests, timber measurement, transport, taxation, etc.
- * Environment, e.g., using the forest carbon tool, forest certification, environmental benefits and hedge establishment
- * Forest protection, e.g., fire and wind, pests and diseases, insurance, health and safety, etc.



14. Look at the Teagasc website, search under 'Forestry - Advice - Protection.

<https://www.teagasc.ie/crops/forestry/advice/forest-protection/>

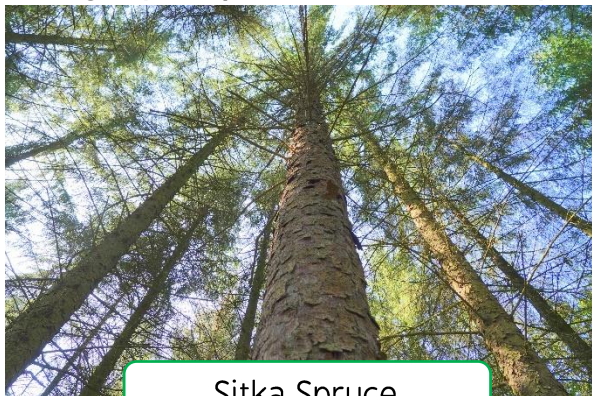
Find out: How many colours are there in the Fire Danger Rating System?



D. FORESTRY PRODUCTS

1. Read:

* Coillte is Ireland's largest producer of roundwood, the raw material that sawmill and panel board customers process into high quality timber and timber products.



Sitka Spruce



* Sitka spruce is Coillte's main commercial tree species. Their annual production of approximately 2.6 million cubic metres of roundwood generates revenue of around €120 million.

* The wood is used in sawmilling, wood based panels, animal bedding, biomass and firewood.

2. Answer the questions: (You may have to carry out your own research)



a) What is Coillte?

b) Who owns Coillte?

c) Describe a Sitka spruce.

d) What is roundwood?



3. Read:

- * Lumber and wood products, including timber for framing, plywood, and woodworking, are created in the wood industry from the trunks and branches of trees through several processes, starting with the selection of logging sites and ending with the milling and treatment processes of the harvested material.
- * Harvesting - Mature trees are harvested from plantations and forests. Trees harvested at a younger age produce smaller logs, and these can be turned into lower-value products. Location, climate conditions, species, growth rate, and silviculture can affect the size of a mature tree.
- * Sawmills - Mills produce large volumes of material and aim to deliver a high quality standard of product. Their goal is to do this efficiently and safely, at low cost, with rapid production time and high output.
- * Production and use - Once the timber has been manipulated in the required way, it can be shipped out for usage. There are many different purposes for wood including plywood, veneer, pulp, paper, particleboard, pallets, craft items, toys, instrument-making, furniture production, packing cases, wine barrels, cardboard, firewood, garden mulch, fibre adhesives, packaging and pet litter.



Freshly cut logs, at a sawmill

4. Write a list of what wood is used for in Ireland.



E. FORESTRY HAZARDS

1. Read:

Forest workers face many hazards on the job including falling branches, chain saw injuries, falls while working on slippery, uneven terrain, heat stress, exposure to the cold and wet weather, exposure to chemicals (direct skin contact with chemicals as well as inhalation of the fumes), musculoskeletal disorders from carrying heavy loads for long hour and vehicle accidents during transportation to and from the work site.

2. What hazards do you see below?



3. Look at the HSA website: <https://www.hsa.ie/> Type 'Forestry' into the search bar. Read and discuss some safety procedures.





Logging and forestry work continues to top the list of most dangerous jobs. Many workers are hurt while working on logging sites. With the use of heavy equipment, chainsaws, and the momentum of falling or rolling trees, logging accidents can cause serious injuries or even death.

4. Name some hazards that you see.





5. Complete the sentences.

injury, qualified, Practice, law, Act, Protective, assessment

- a) The Health and Safety and Welfare at Work 2005 is a legal requirement.
- b) The Code of for Managing Safety and Health in Forestry Operations published by the Health and Safety Authority (HSA) sets out the legal duties on Landowners, Forestry Works Managers and Contractors.
- c) When planning and carrying out forestry operations, the requires that health and safety duties must be completed.
- d) A Safety Statement is a written document aimed at reducing risk or or ill-health for all people working in the forest.
- e) The Safety Statement should:
 - * Include a written risk
 - * List safe working procedures
 - * Include that operators are competent and for their tasks
 - * Name the necessary tools/machinery for the task
 - * Give the steps to supervise and monitor the work
 - * Emphasise the need for suitable Personal

Equipment (PPE)

- * Protect public health and safety





2. Identify the trees. Write the letters.

A. Norway Maple

B. Willow

C. Ash

D. Wild Cherry

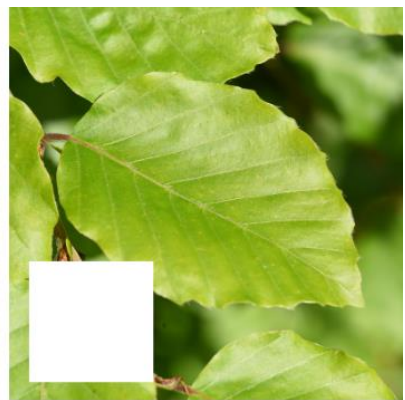
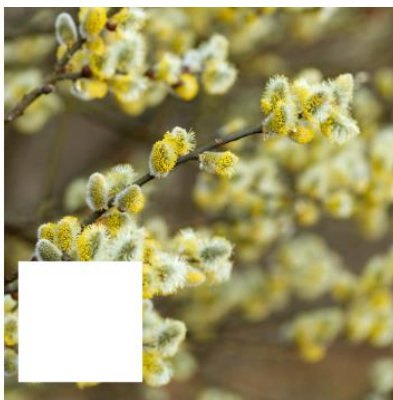
E. Green Beech

F. Sessile Oak

G. Yew

H. Douglas Fir

I. Common Alder





1. Read:

Roots

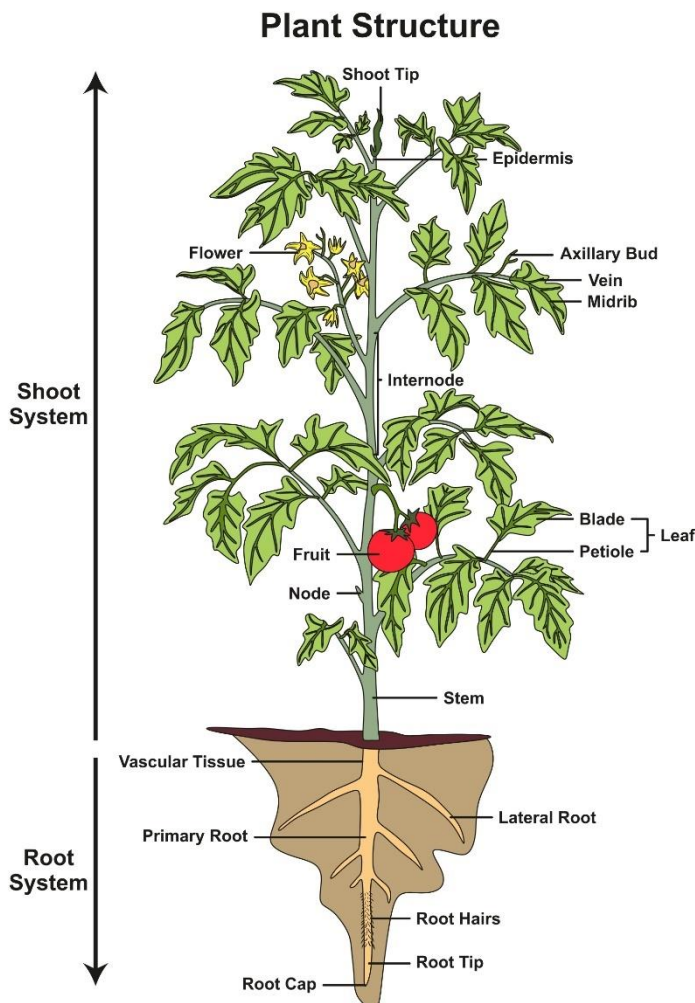
This is the part that lies below the surface of the soil. The top part of a root (root apex) is covered by a covering known as root cap.

Functions:

- * Absorbing water and minerals from the soil
- * Storing food for future use
- * Producing plant growth hormones
- * Anchoring the plant firmly to the soil and providing support
- * Developing new plants from the roots of the old plant (vegetative reproduction)



2. Study the diagram below:



What is a root cap?

What do the roots absorb from the soil?

Which hormones do the roots produce?

Name another 2 functions of roots.



D. THE AGE OF A TREE

You are going to calculate the age of a tree using a cross section.

Read:

Counting tree rings is one of the most accurate ways to tell a tree's age. You need to find the stump of a tree that has been cut down or get a cross-section of wood from near the bottom of the tree that shows all the rings.



Follow these steps.

1 Find the centre of a tree stump or cross-section of a tree that has been cut. (Make sure the tree was cut horizontally so the stump or cross-section is quite flat) Don't use a stump or cross-section of wood that is rotten or falling apart or you won't be able to accurately count the rings.

By the way: This way of telling of telling a tree's age by counting the rings does not work for ALL trees. Some types of tropical trees, for example, do not form visible rings inside their trunks.

2 Look for alternating dark-coloured rings and light-coloured rings in the trunk. The light rings form during the first part of the growing season and the dark rings form at the end. Each pair of light and dark rings adds up to 1 year of growth for the tree. The light rings usually form in spring and early summer, while the dark rings form in late summer and fall.

3 Count the dark rings to calculate the age of the tree. Start in the middle of the stump or cross-section of wood and count the first dark ring you see. Continue counting outwards from the middle ring until you reach the last dark ring. The total number of dark rings represents the age of the tree in years. (Don't count the bark of the tree as a dark ring. It doesn't represent a year of growth because the bark just continues to get pushed out as the tree grows from the inside. You can use a magnifying glass to help you count the rings if they are small and close together.

How old is this tree?



*Look at the rings of real trees. Take photos and write the ages. Include with your Portfolio.



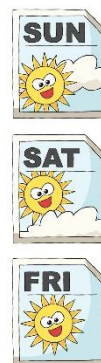
WEATHER STATION

Look at the weather report for your area.

Go to the Met Éireann website: <https://www.met.ie/>

There are six parts of weather. Which of these parts can you find on the website, related to your area?

- Temperature
- Cloudiness
- Atmospheric pressure
- Precipitation
- Wind
- Humidity



Which area are you in?

What is the minimum and maximum temperature for the day?

Minimum -

Maximum -

Is it a good day for the beach? Say why or why not.

Do you have a weather app on your phone?

Yes

No





Read:

The maximum-minimum thermometer consists of a U-shaped glass tube filled with alcohol on both ends of the tube. As the alcohol expands in response to temperature changes, the metal index on both sides of the thermometer record the maximum and minimum temperatures.



Name another 2 types of thermometers that could be used outdoors.

Record the weather over a period of time. (ask your teacher) *Use the **Weather Watching Log Book**. (available separately)

Use a thermometer to record the temperatures.

Use a rain gauge to record precipitation. (See the slides on how to make your own)



Rain gauge



MAPPING OF LEARNING OUTCOMES

UNIT 1: THE FORESTRY INDUSTRY IN IRELAND

1. List the major forestry products and their uses

Pages 20 to 25 (forestry products)

2. Use a map to identify major areas of forestry in Ireland

Page 10 (National Forestry Inventory)

Page 16 (map of Ireland – major forests)

3. Summarise the role of the Forestry Service and Coillte

Pages 9 and 10 (forest ownership)

Page 11 (Forestry Service)

Pages 12 and 13 (Forestry Service and Coillte)

Page 14 (Teagasc)

Page 15 (forestry roles)

Pages 17 to 18 (forestry and the law, including Coford and certification)

Separate: Page 10 - graph showing ownership (optional)

Separate: Page 15 - profile of a forest (optional)

4. Prepare a report on the main uses of Irish forestry products

Pages 20 to 25 (forestry products)

Separate: Page 25 - report

5. List common injuries in forestry work

Separate: Page 31 - display or presentation on common forestry hazards, common injuries, how to minimise risks

6. Recognise possible hazardous situations

Pages 26 to 33 (forestry hazards)

Page 34 (forest fires)

Separate: Page 31 - display or presentation on common forestry hazards, common injuries, how to minimise risks

7. Be aware of the importance of safe practice



Page 32 (questions for specialist working in the forestry sector)

Separate: Page 32 - questions and answers (visit from the specialist)

8. Be aware of the importance of training and protective clothing

Page 32 (questions for specialist working in the forestry sector)

Separate: Page 32 - questions and answers (visit from the specialist)

9. Devise a list of general safety precautions.

Page 33 (list of general safety precautions)

Separate: Page 31 - display or presentation on common forestry hazards, common injuries, how to minimise risks

Extra:

Page 7 (what is forestry)

Pages 8 to 16 (forestry in Ireland)

Page 19 (agroforestry)

UNIT 2: COMMON FORESTRY TREES AND THEIR BIOLOGY

1. Recognise 8 (4 deciduous, 4 evergreen) common commercial species, using either leaves, buds, twigs, bark, fruit, flowers or form

Page 37 (deciduous and evergreen)

Pages 38 to 45 (tree identification)

Pages 46 to 48 (types of trees)

Separate: Page 45 – Tree ID Project

Separate: Page 45 – labelled drawing of a winter twig

Separate: Forest Trees Information Booklet

2. Acquire a basic knowledge of the principal features of plants and their functions, i.e. root, stem, leaves, flowers and fruit

Pages 49 to 62 (principal features of plants, including roots, stems, leaves, flowers, fruits, seeds, photosynthesis, reproduction, pollination, transpiration)

Separate: Page 59 – labelled rough diagram showing pollination (optional)



3. Calculate the age of a tree using a cross section

Pages 63 and 64 (age of a tree)

Separate: Page 63 – looking at rings of trees, recording / taking photos

4. Identify seeds from trees grown locally, and harvest them at the appropriate time

Pages 65 to 68 (tree seeds)

Separate: Page 67 - seed display

5. Treat seeds to overcome dormancy if necessary

Page 68 (stratification)

Separate: Page 68 – research on seed dormancy (optional)

Separate: Page 69 – gardening journal

6. Propagate a tree from seed

Pages 69 to 70 (propagating a tree from seed)

Separate: Page 69 – gardening journal

7. Identify the parts of a winter twig from a deciduous tree. e.g. Ash

Page 45 (winter twigs)

Separate: Page 45 – labelled drawing of a winter twig

8. Devise a method to measure the girth and height of a selected tree.

Page 71 (measuring the girth and height of a tree)

UNIT 3: CLIMATE, SITE SELECTION AND MULTIPLE LAND USE

1. Take instrument readings from a simple weather station, i.e., max. and min. thermometer, wet and dry bulb thermometer, rain gauge

Pages 74 to 75 (weather station)

Separate: Page 75 – weather watching log book

2. Be aware of the effects of climate, weather on Ireland's suitability as a timber producer

Pages 76 to 78 (effects of climate)



3. Be aware of the effect of wind on species selection

Page 77 (windthrow)

4. List the site requirements for a common deciduous and coniferous forest species explain the potential for conflict in competing land use, and suggest ways of integrating agricultural, leisure and forestry needs

Page 79 (site requirements)

Page 80 (conflict in competing land use)

Separate: Page 79 – inviting a person from the forestry sector, questions and answers, group reporting back to the class

Separate: Page 80 – idea board

6. Compile a report on the potential leisure uses of various forest types in the local area

Pages 81 to 83 (forest recreation)

Separate: Page 82 – visiting a forest

Separate: Pages 82 and 83 - report on the potential leisure uses of various forest types in the local area

7. Explain how forestry will affect the environment in respect of habitats, landscapes, areas of scientific interest, archaeological sites, fisheries and wildlife

Pages 84 to 88 (effects of forestry)

8. Suggest ways in which the impact of forestry on people, animals and the environment can be minimised.

Pages 89 to 91 (impact of forestry)