Leaving Certificate
Agricultural Science:
Plant Science and Cultivation

Please see *Teachers' Notes* for explanations, additional activities, and tips and suggestions.

Learning Support	Vocabulary, key terms working with text and writing text	**Pages 3-10, 12-13**
Language Support	Vocabulary, key terms, grammar, working with text and writing text	**Pages 3-13**
Subject class	Key vocabulary	**Pages 3-10**
Learning focus	Using Agricultural Science textbooks and accessing curriculum content and learning activities.	
Levels for Language Support students	Students' English-language skills should be developed to **Level B1** during funded Language Support. Mainstream subject learning will require the development of skills at **Level B2** if students are to cope with public examinations.	
Contents of this Unit		**Page**
	Keywords	3,4,5
	Vocabulary file	6,7
	Activating students' knowledge	8
	Focus on vocabulary	9,10
	Focus on grammar	11
	(*nouns and adjectives*)	
	Focus on reading	12
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	(*writing sentences*)	
	Answer Key	14-16

Using this unit

Language support and mainstream subject class

The sections ***Activating students' knowledge***, ***Focus on vocabulary***, and ***Focus on grammar*** have been designed, in particular, for Language Support classes.

Focus on reading and ***Focus on writing*** are suitable for use in either Language Support or subject classes.

Answer Key

Answers are provided at the end of the unit for all activities except those based on free writing.

Textbooks

This unit focuses on the sections dealing with plant science and cultivation in the Leaving Certificate Agricultural Science curriculum. Students will need to use their textbooks if they are to gain the most benefit from the activities.

Learning Record

The Learning Record is intended to help students monitor their progress. This can be downloaded or printed from the website in the section *Advising Students and Record of Learning for the Leaving Certificate*. A copy of the Learning Record should be distributed to each student for each unit studied**.**

Students should:

1. Write the subject and topic on the record.
2. Tick off/date the different statements as they complete activities.
3. Keep the record in their files along with the work produced for this unit.
4. Use this material to support mainstream subject learning.

Symbols

Symbols are used throughout the unit to encourage students to develop their own learning and support materials.

prompts students to file the sheet when they have completed the activity. This is used for activities which can be used as a reference in the future e.g. for subject classroom, revision, homework etc.

prompts students to add vocabulary, definitions, or examples of vocabulary in use to their own personal glossary for the topic. A personal glossary makes study and revision more efficient.

Keywords

The list of keywords for this unit is as follows:

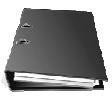
absorbed
abundant
achieved
acid
acidification
activity
addition
additive
aeration
agricultural
amino
ammonium
amounts
anaerobic
aphids
application
applied
autumn
availability
bacteria
bacterial
barley
bases
beakers
beet
biological
blades
blanket
blight
borne
botanical
buttercup
calcium
cambium
capacity
capillary
carbohydrates
cattle
cell
cellulose
cereal
certified
chemical
clamps
clay
climatic
clover
clovers
cocksfoot
colloidal
colloids
coloured
commonly
composition
compounds
concentration
conditions
cones
constituents
consumption
content
control
crop
cultivate
cut
cuttings
debris
deficiency
degradation
degraded
demonstration
depth
derived
described
develops
diffusion
digestibility
digestible
disc
disease
distilled
drainage
drained
dried
drill
drilling
dry
due
during
early
earth
earthworm
easily
effluent
elodea
ensiling
epidermal
epidermis
establishment
examine
exercise
extent
farmer
farmyard
feed
feeding
fern
fertility
fertilization
field
fig
fixation
flasks
flocculation
floral
florets
flower
flowering
fodder
forest
forestry
formation
found
fresh
fruits
fungal
fungicide
fungus
furrow
further
gametophyte
genus
germinating
germination
glaciations
grain
granite
grass
grassland
gravitational
graze
gritty
ground
grow
harrows
harvest
hay
haymaking
herbage
herbicide

horizon
horticulture
implements
importance
infiltration
inorganic
intensity
intensive
intermediate
involves
laboratory
lactic
land
large
layer
leached
leaching
leads
leaf
levels
leys
lime
limestone
lipids
livestock
loam
losses
low
machinery
mainly
malting
manure
manures
material
matter
meadow
microscope
mineral
mitochondria
mixtures
modifications
modified
moisture
molasses
nitrate
nitrogen
nutrient
oats
obtain
occupy
occur
operation
organic
organisms
osmosis
oxidation
paddock
palatable
pallet
parent
particle
parts
pasture
perennial
permanent
pest
petals
phloem
phosphate
phosphorus
photosynthesis
pine
pit
plant
plants
plough
pore
potash
potassium
potato
practised
precautions
procedure
process
produce
production
productivity
profile
propagation
properties
proteins
protoplasm
quality
quartz
rainfall
range
record
reduction
referred
reproduction
requirements
residual
residues
respiration
results
reversible
rock
rollers
root
rotary
rotation
rotted
ryegrass
samples
sandstone
sandy
science
season
seed
seedbed
seedlings
selective
shale
sheep
shoots
should
shown
sieved
silage
silt
similar
since
size
slurry
soil
soluble
sowing
spacing
specialized
species
sporangia
spores
sprays
spreader
spring
sprout
spruce
stage
stamens
stem
stocking
storage
strains
straw
structure
sucrose
sugar
sugars
suitable
sulphur
surface
surfaces

sward
systemic
table
tend
textural
texture
thinning
threads
thus
tillage
tillers
timber
tissue
tissues
tonnes
topography
tractor
trees
tuber
tubing
uptake
varieties
vascular
vegetation
washed
water
weather
weathering
weed
wet
wheat
wilting
winter
xylem
yield

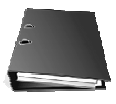
Vocabulary file (1) for the topic
Plant Science and Cultivation

Word	Meaning	Page(s) in my textbook	Note
chemicals			
microbes			
fungi			
germination			
stems			
tillage			
cereals			
roots			



Vocabulary file (2) for the topic
Plant Science and Cultivation

Word	Meaning	Page(s) in my textbook	Note
grassland			
silage			
hay			
forestry			
fertilizers			
manure			
topography			
soil			
classification			



Introduction

Activating students' existing knowledge

Use a spidergram to activate students' ideas and knowledge on the key points in this chapter. See **Teachers' Notes** for suggestions.

Possible key terms for the spidergram:

Plants

Horticulture

Forestry

- Invite newcomer students to provide key words in their own languages.
- Encourage dictionary use.
- Encourage all students to organise their vocabulary into relevant categories (e.g. meaning, nouns, keywords, verbs etc.).

All students should record vocabulary and terms from the spidergram in their personal dictionaries.

Language Level: B1
Individual / pair

Focus on vocabulary

1. Matching

Match each expression in Column A with a definition in Column B. Draw a line between the matching expressions.

Column A	Column B
agricultural science	the work and methods of growing crops and looking after animals which are then used for food
forestry	animals that are kept on a farm
agriculture	the study or activity of growing plants
livestock	the work of looking after or making forests
industrialisation	the application of scientific principles to the production of food and fibre for human use
horticulture	the process of developing industries in a country

2. Now check your understanding of the key words by completing the blanks in the sentences below.

- _____ has been known and practised for very many years.
- _____ has always been of great economic and social importance in Ireland.
- The numbers employed in agriculture will continue to fall as _____ increases and farming becomes more mechanised and technical.
- There is scope for more expansion in _____ especially in the areas of fresh vegetables and protected crops.
- _____ is located mainly in mountain and hill land and on blanket peat in the west of the country.
- Planting in Ireland has been restricted because of our long tradition of _____ farming.

3. Missing Words

Study the words in the box, and then check you understand them by putting them into the sentences (mainly definitions) below.

chromosome	cells	nucleus	hormones	organisms	respiration
transpiration	species	microscopes	plough		
crop rotation	vitamins	carbohydrates			

- _____ are the basic unit of all plants and animals.
- _____ are precision instruments and must be used with care.
- The vast majority of cells contain a _____.
- Normal plant and animal cells have a pair of every _____; each member of the _____ is identical or almost so.
- The main chemicals found in living _____ are carbohydrates, proteins, amino acids and lipids.
- _____ are chemicals which contain the elements carbon, hydrogen and water.
- _____ are organic chemicals which cannot be made by the animal itself and must be included in its diet.
- _____ is the process used by organisms to release energy.
- A _____ is a group of closely related organisms which interbreed and produce offspring.
- Plant _____ are chemicals which influence the growth of plants.
- _____ is the loss of water vapour by the plant to the atmosphere around it.
- The _____ is an implement designed to turn over a layer of soil in preparation for further cultivation and sowing the crop.
- _____ is the growing of crops in a definite sequence to help control pests and to help maintain soil structure.

Language Level: B1
Individual / pair

Focus on grammar

4. Nouns and adjectives

(*adjective: a word that describes a noun or pronoun, for example: big, boring, green***)**

For each noun in the list, write the matching adjective. We have done the first one for you. (Use your textbooks to help you find the answers).

Noun	Adjective
agriculture	agricultural
science	
biology	
disease	
fungus	
toxicity	
industrialisation	
unemployment	
horticulture	
harvest	
forest	
frequency	

5. Write sentences, or search for sentences in your textbooks, which contain the nouns or adjectives from the lists above. Two have been done for you.

Example 1: Ireland has developed as an exporter of ***agricultural*** produce.

Example 2: The trend towards ***industrialisation*** has been less here than in many developed countries.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Language Level: B1 / B2
Individual / pair

Focus on reading

6. Practise reading quickly! Read the questions a) to h), and then match them to the answers in the boxes, 1-8. Sometimes you won't know the answer because you haven't studied it yet, but you can guess – use clues such as the number of pieces of information, and your own general knowledge.

a) What is the difference between a selective herbicide and a total herbicide?
b) Where are chromosomes found in a cell?
c) What type of cell division leads to a reduction in chromosome number?
d) What term is used to describe the number of chromosomes in a sex cell?
e) How can the farm animal be treated immediately for the liver fluke infection?
f) What causes contamination of milk?
g) Why are the samples taken in a W-shaped pattern?
h) What is meant by the term soil pH?

3. Meiosis .

1. Dose animal or inject animal

2. Microorganisms or poor hygiene or improper cooling

4. To ensure they are representative of the area.

5. Selective: kills weeds only
Total herbicide: kills all vegetation

6. Nucleus

7. Haploid or n

8. Acidity

Language Level: B1 / B2
Individual / pair

Focus on writing

7. Practise writing sentences by putting the words and phrases into the correct order.

a) which/groups of cells/ are called tissues/ perform specialized functions.

Groups of cells which perform specialized functions are called tissues.

b) is called the protoplasm /the living part/ and / it is surrounded/ of each cell/ by a cell membrane

_____

c) contain an embryo /the seeds of flowering plants/ develops into a seedling/which

_____

d) generally face outwards / has observed/plants growing on a window / nearly everyone/ how

_____

e) to /many organisms/day length/react

_____

f) of the plant/ are modified/ many parts /for special purposes/ food storage/ such as

_____

g) are a different form /tubers/ underground stems/ of

_____

h) mainly by / are/ flowering plants /classified/their flower structure

_____

i) are identified/plants /using identification guides

_____

j) but/large ploughs/ to operate them/ require a very powerful tractor /are capable of very fast work rates

_____

Answer key

1.

agricultural science	the application of scientific principles to the production of food and fibre for human use
forestry	the work of looking after or making forests
agriculture	the work and methods of growing crops and looking after animals which are then used for food
livestock	animals that are kept on a farm
industrialisation	the process of developing industries in a country
horticulture	the study or activity of growing plants

2.

- **Agricultural science** has been known and practised for very many years.
- **Agriculture** has always been of great economic and social importance in Ireland.
- The numbers employed in agriculture will continue to fall as **industrialisation** increases and farming becomes more mechanised and technical.
- There is scope for more expansion in **horticulture** especially in the areas of fresh vegetables and protected crops.
- **Forestry** is located mainly in mountain and hill land and on blanket peat in the west of the country.
- Planting in Ireland has been restricted because of our long tradition of **livestock** farming.

3.

- **Cells** are the basic unit of all plants and animals.
- **Microscopes** are precision instruments and must be used with care.
- The vast majority of cells contain a **nucleus.**
- Normal plant and animal cells have a pair of every **chromosome**; each member of the **chromosome** is identical or almost so.
- The main chemicals found in living **organisms** are carbohydrates, proteins, amino acids and lipids.
- **Carbohydrates** are chemicals which contain the elements carbon, hydrogen and water.
- **Vitamins** are organic chemicals which cannot be made by the animal itself and must be included in its diet.
- **Respiration** is the process used by organisms to release energy.
- A **species** is a group of closely related organisms which interbreed and produce offspring.

- Plant **hormones** are chemicals which influence the growth of plants.
- **Transpiration** is the loss of water vapour by the plant to the atmosphere around it.
- The **plough** is an implement designed to turn over a layer of soil in preparation for further cultivation and sowing the crop.
- **Crop rotation** is the growing of crops in a definite sequence to help control pests and to help maintain soil structure.

4.

Noun	Adjective
agriculture	agricultural
science	scientific
biology	biological
disease	diseased
fungus	fungal
toxicity	toxic
industrialisation	industrialised
unemployment	unemployed
horticulture	horticultural
harvest	harvested
forest	forested
frequency	frequent

6. a) 5
b) 6
c) 3
d) 7
e) 1
f) 2
g) 4
h) 8

7.

a) Groups of cells which/perform specialized functions are called tissues.

b) The living part of each cell is called the protoplasm and it is surrounded by a cell membrane.

c) The seeds of flowering plants contain an embryo which develops into a seedling.

d) Nearly everyone has observed how plants growing on a window generally face outwards.

e) Many organisms react today length.

f) Many parts of the plant are modified for special purposes such as food storage.

g) Tubers are a different form of underground stems.

h) Flowering plants are classified mainly by their flower structure.

i) Plants are identified using identification guides.

j) Large ploughs are capable of very fast work rates but require a very powerful tractor to operate them.