

Leaving Certificate

Biology

The Characteristics of Life

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

Levels	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.	
Language focus	Key vocabulary, word identification, sentence structure, extracting information from text, writing text, grammar.	
Learning focus	Using Biology textbooks and accessing curriculum content and learning activities.	
Acknowledgement	The <i>English Language Support Programme</i> gratefully acknowledges the permission of Gill and Macmillan to reproduce excerpts from <i>Biology Now!</i> by Tommy Murtagh.	
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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 section *The Characteristics of Life* of the Leaving Certificate Biology 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

Nouns

ability
animals
bacteria
cells
chemicals
continuity
energy
excretion
food
life
matter
metabolism
muscle

nutrition
organism
parent
plants
processes
reactions
removal
reproduction
responses
waste

Verbs

to carry
to copy

to involve
to remove
to reproduce
to survive

Adjectives

living
sexual

Other terms

all
their
within

NAME: _____ DATE: _____
Leaving Certificate Biology: The Characteristics of Life

Vocabulary file for the topic

The Characteristics of Life

Word	Meaning	Page(s) in my textbook	Note
organism			
metabolism			
continuity			
responses			
life processes			
reproduction			
respiration			
excretion			
nutrition			



NAME: _____ DATE: _____
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Word	Meaning	Page(s) in my textbook	Note
anabolism			
catabolism			
behaviour			
to survive			
to make copies			
sexual			
asexual			
muscles			
sense organs			



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:

Living things

What do we know about life?

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

How do we know that something is living?



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

Level: B1
Individual / pair

Focus on vocabulary

1. Missing words

The following sentences are taken from your textbooks. They describe the **five fundamental responses** of organisms in order to stay alive. The key words are missing. First, check that you understand the meanings of the key words in the box below, then read the sentences and fill in the gaps.

- a) _____ is an organism's ability to make copies of itself.
- b) _____ is necessary to provide energy and matter.
- c) Living organisms get rid of wastes by _____.
- d) _____ is the way that cells are grouped to form complete systems.
- e) Living organisms must constantly change their _____ to respond to changing environments.

behaviour excretion nutrition organisation reproduction

2. Vocabulary in use

Write a short sentence using each of the following terms. Check your Word File, text book or dictionary if you need help.

continuity _____

metabolism _____

muscles _____

growth _____

sense organs _____



3. Matching

Match each term in Column A with a definition in Column B. Draw a line between them. Look at your text book if you need help.

Column A	Column B
muscle tissue	physical substance
bacteria	the process through which plants or animals create fruit or young
driving force	the ability to continue to live or exist
survival	the groups of cells in the body that can tighten and relax to produce movement
matter (in Biology)	the force that makes somebody or something do a particular thing
fertilisation	a type of very small organism that lives in air, earth, water, plants and animals, often one which causes a disease

4. Key phrases in use

The sentences below are all from your text books. They are missing 4 of the key terms from exercise 3 above. Select the correct ones.

- Continuity is the _____ for living organisms.
- Cells are organised into _____.
- In sexual reproduction gametes join together in the process of _____.
- _____ are unicellular, consisting of a single cell.



NAME: _____ DATE: _____

Leaving Certificate Biology: The Characteristics of Life

Level: B1
Individual / pair

Focus on grammar

5. Verbs

Use verbs from the box below to complete these sentences.

- Life _____ an interaction of processes towards the twin needs of metabolism and continuity.
- Most organisms _____ of many cells joined together.
- All of the muscles in the human body _____ the muscle system.
- Nutrition is needed to _____ everything that an organism does.
- Excretion _____ toxic wastes.
- The zygote _____ into a new individual.
- Living organisms constantly _____ to their changing environment.



to respond	to remove	to maintain	to consist
	to involve	to develops	to form

Note: The verb **to consist** is usually followed by **of** (to consist of).

6. The passive form

You will often find the passive form of verbs in your textbooks.

In an **active** sentence, the subject does the action. For example:

Subject	verb	object
Animals	detect	changes

The passive form is constructed by using the verb 'to be' with the past participle of the main verb. For example:

Changes are detected (by animals)

If we want to say who or what **did** the action, we add **by** _____.

Put these short sentences in the passive form:

- Plants alter their growth.
Growth _____.
- Food provides energy and matter.
Energy and matter _____.
- We divide the chemical reactions of life into two groups.
The chemical reactions of life _____.
- 'Selfish genes' direct living organisms.
Living organisms _____.

Level: B1 / B2
Individual / pair

Focus on reading

7. Read the text carefully and find the correct statement below. There is one correct answer for each question. Circle the correct answer.

Excretion is the removal of the waste products of metabolism. These products are toxic to the organism and must be removed before they build up into dangerous quantities. Excretion not only removes toxic wastes but also helps the organism to maintain a constant internal environment regardless of conditions on the outside. In humans and higher animals, excretion is done through the highly organised structures of the lungs, the urinary system, the skin and the liver. Plant excretion is through the stomata of their leaves.

- 1) Waste products are
 - a) **poisonous.**
 - b) **nutritious.**
 - c) **good for growth.**
 - d) **safe in large quantities.**
- 2) Excretion helps an organism to manage
 - a) **muscle.**
 - b) **temperature.**
 - c) **the internal environment.**
 - d) **the brain.**
- 3) The liver is part of
 - a) **stomata.**
 - b) **the system for excretion.**
 - c) **the lungs.**
 - d) **the skin.**
- 4) What is another word for **toxic**? _____
- 5) What does **regardless of conditions on the outside** mean in the text above?



8. Reading for the main idea

It is not always necessary to read through every sentence and paragraph of text. Nor do you have to understand every single word. However, It is important to read with a purpose.

1. In this exercise you must read each paragraph (taken from your textbook) to decide on the main idea of that paragraph.
2. Then write the topic of the paragraph on the blank line.
3. Underline where you find the topic information. Is it in the first sentence of the paragraph or does it appear later?

You should **try** to read quickly, without stopping to check every word. However, sometimes it is necessary to read with more focus when the topic is not immediately clear.

a) Topic: _____

Cells have the effect of organising the structures and chemicals within themselves. A random mixing of chemicals would result in chaos within the organism and would not serve the need to stay alive.

b) Topic: _____

Another feature of life is continuity. All living organisms do their best to survive in their environment and then reproduce in order that life on earth may continue. This driving force is always present and life continues regardless of individual deaths. Living organisms are directed by many 'selfish genes' that are programmed for immortality.

c) Topic: _____

Asexual (non-sexual) reproduction is when part of a single parent splits from the parent and develops into a new individual. No sex cells are involved and the new individual is genetically identical to its single parent. Examples include the division of bacteria in two.

d) Topic: _____

Living organisms are constantly responding to their changing environment. They behave in a huge variety of ways, which they calculate to have *survival value*. Animals use their muscles and glands to respond to changes detected by their sense organs: eyes, ears, skin etc. Their behaviour will help them avoid danger and find food. Plants respond to changes in light and temperature by altering their growth.

Level: B1 / B2
Individual / pair

Focus on writing

9. Writing a paragraph

Remember!

- A paragraph is a unit of information unified by a central controlling idea.
- Paragraphs should focus on one piece of information.
- The main idea in a paragraph is often expressed in one particular sentence (called the topic sentence). This sentence is usually at the beginning of a paragraph, but can come at the end or even in the middle.
- It is important to organise the information logically in a paragraph.

Write a paragraph on the topic *The characteristics of Life*.

Include a sentence about each of the following points. Use your **textbook** if you need to check the information.

- The characteristics of life – how many are there?
- What are the characteristics?
- Explain each one briefly in a single sentence.

Answer Key

Focus on vocabulary

1. Missing words

- a) **Reproduction** is an organism's ability to make copies of itself.
- b) **Nutrition** is necessary to provide energy and matter.
- c) Living organisms get rid of wastes by **excretion**.
- d) **Organisation** is the way that cells are grouped to form complete systems.
- e) Living organisms must constantly change their **behaviour** to respond to changing environments.

3. Matching

Column A	Column B
muscle tissue	the groups of cells in the body that can tighten and relax to produce movement
bacteria	a type of very small organism that lives in air, earth, water, plants and animals, often one which causes a disease
driving force	the force that makes somebody or something do a particular thing
survival	the ability to continue to live or exist
matter (in Biology)	physical substance
fertilisation	the process through which plants or animals create fruit or young

4. Key phrases in use

- a) Continuity is the **driving force** for living organisms.
- b) Cells are organised into **muscle tissue**.
- c) In sexual reproduction gametes join together in the process of **fertilisation**.
- d) **Bacteria** are unicellular, consisting of a single cell.

Focus on grammar

5. Verbs

- a) Life **involves** an interaction of processes towards the twin needs of metabolism and continuity.
- b) Most organisms **consist** of many cells joined together.
- c) All of the muscles in the human body **form** the muscle system.
- d) Nutrition is needed to **maintain** everything that an organism does.
- e) Excretion **removes** toxic wastes.
- f) The zygote **develops** into a new individual.
- g) Living organisms constantly **respond** to their changing environment.

6. The passive form

- a) Growth **is altered** by plants.
- b) Energy and matter **are provided** by food.
- c) The chemical reactions of life **are divided** into two groups.
- d) Living organisms **are directed** by 'selfish genes'.

Focus on reading

7.

- 1) a)
- 2) c)
- 3) b)
- 4) poisonous
- 5) It does not matter what the conditions are like outside.

8. Reading for the main idea

a) Topic: **Organisation by cells**

Cells have the effect of organising the structures and chemicals within themselves. A random mixing of chemicals would result in chaos within the organism and would not serve the need to stay alive.

b) Topic: **Continuity and survival of living organisms**

Another feature of life is continuity. All living organisms do their best to survive in their environment and then reproduce in order that life on Earth may continue. This driving force is always present and life continues regardless of individual deaths. Living organisms are directed by many 'selfish genes' that are programmed for immortality.

c) Topic: **Asexual reproduction**

Asexual (non-sexual) reproduction is when part of a single parent splits from the parent and develops into a new individual. No sex cells are involved and the new individual is genetically identical to its single parent. Examples include the division of bacteria in two.

d) Topic: **Behaviour and responses of living organisms**

Living organisms are constantly responding to their changing environment. They behave in a huge variety of ways, which they calculate to have *survival value*. animals use their muscles and glands to respond to changes detected by their sense organs: eyes, ears, skin etc. Their behaviour will help them avoid danger and find food. Plants respond to changes in light and temperature by altering their growth.