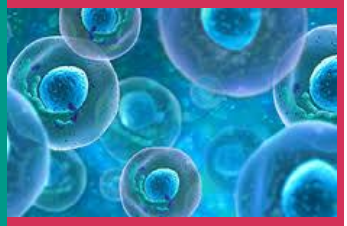
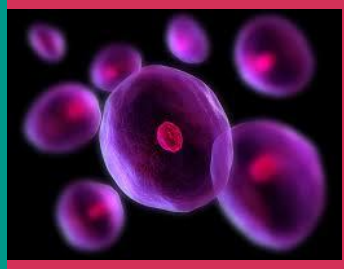
CLIL Biology

A' CLASS

2015 -2016

1st Experimental Middle School of Athens





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Sample Pages

UNIT 1: Living Organisms

Description

The lesson is designed for Greek students who learn English as a foreign language and is part of a series of lessons based on CLIL (Content and Language Integrated Learning). In collaboration with the Biology teacher, the lessons are in step with the corresponding modules in the Biology coursebook (Unit 1.1). This first lesson is on the Characteristics of living organisms. It is designed for 13 year olds at an advanced level of English (B2 level). There is also differentiated instruction for lower level learners.

Aims

- To link the subject of the English language to the subject of Biology. - To introduce terms and texts related to Biology. - To have students work in groups effectively - To collaborate and investigate

Outcomes

- **Knowledge** To familiarize students with terminology related to Biology in English
- **Comprehension** o enable students to comprehend English texts related to Biology.
- **Application** To enable students to apply knowledge in investigation and project work.

Lesson Planning: http://v.gd/RnmEct

Characteristics of living things

Mating earthworms

When you look at the world around you, how do you categorise or group what you see? In science, the broadest groupings are living and non-living. This may sound simple, but it is sometimes difficult to decide whether something is truly alive or not. So why would we say earthworms are living?

All living things share life **processes** such as growth and reproduction. Most scientists use seven life processes or characteristics to **determine** whether something is living or non-living.

The table below describes seven characteristics of most living things and contains references to earthworms to help you decide if they are living or non-living.

Life process	Explanation	Earthworms
Movement	All living things move in some way. This may be obvious, such as animals that are able to walk, or less obvious, such as plants that have parts that move to **track** the movement of the sun.	Earthworms use circular and **longitudinal** muscles to move through **soil** or along surfaces.
Respiration	**Respiration** is a chemical reaction that happens within cells to **release** energy from food.	The food that earthworms eat supplies their body with energy-rich **molecules** such as **glucose**. On **entering** the cells of their body, these molecules are broken down in a series of steps to release

		energy to be used by the body, producing **carbon dioxide** and water as waste products.
Sensitivity	The ability to **detect** changes in the surrounding environment.	Earthworms have light-sensitive cells **scattered** in their outer skin. Their skin cells are also sensitive to touch and chemicals.
Growth	All living things grow.	Earthworms **hatch** from eggs and can grow up to a metre or more in length! Some earthworms are also able to regrow small parts of their body that have been lost or injured.
Reproduction	The ability to reproduce and pass genetic information onto their **offspring**.	Earthworms have both sperm and eggs within their bodies (they are hermaphrodites) but they cannot self-**fertilise** and need to mate with another individual. After mating, a **cocoon** containing the fertilised eggs is **deposited** in the soil.
Excretion	Getting rid of waste.	Earthworms **excrete** waste from their **anus** – the last **segment** of their body.
Nutrition	The **intake** and use of **nutrients**. This occurs in very different ways in different kinds of living things.	Earthworm nutrition comes from a variety of sources, depending on their species. Food types include **manure**, **compost**, plant material, **fungi**, microorganisms and **decaying** animals. They take in food through their mouths.

Source: http://www.sciencelearn.org.nz/Science-Stories/Earthworms/Characteristics-of-living-things

Glossary:

Earthworm: a common type of worm, which moves through the earth
Mate (v): to have sex and produce young
Process: a series of actions that you take in order to achieve a result
Determine: to decide what will happen
Track (v): to follow a person or an animal by looking for proof
Longitudinal: in the long direction of the body
Soil: the material on the surface of the ground in which plants grow
Respiration: breathing
Release: to allow a substance to flow out from somewhere
Molecule: the simplest unit of a chemical substance
Glucose: a type of sugar that is found in plants
Enter: to come or go into a particular place
Carbon dioxide: the gas formed when carbon is burned, or when people or animals breathe out
Detect: to notice something that is not clear
Scatter: to (cause to) move far apart in different directions
Hatch: to (cause an egg to) break in order to allow a young animal to come out
Reproduction: the process of having babies, producing young, or new plants
Offspring: the young of an animal
Fertilise: to spread a natural or chemical substance on land in order to make plants grow well
Cocoon: the covering that surrounds and protects particular insects
Deposit: to leave something somewhere
Excrete: to get rid of material from the body
Anus: the opening through which solid waste leaves the body
Segment: part
Intake: the amount of a particular substance that is eaten or drunk
Nutrients: any substance that plants or animals need in order to live and grow
Manure: solid waste from animals
Compost: decaying plant material
Fungus (pl. fungi): types of organism that get their food from decaying material
Decay: to (cause something to) become gradually damaged

(Try to elicit the Greek equivalent of terms and give the Greek meaning if needed)

Procedure

1. Brainstorming: Beginning of the text. Ask Ss what a living thing is and give examples. Elicit some characteristics of living things.

2. Read the introduction and introduce next task.

3. Divide into 3 groups and give each one two different characteristics with the example of earthworms. Give each group a glossary with terms. They read their part and exchange information by asking questions. Introduce the MRS GREN term to memorize the 7 characteristics.

The seven characteristics could be memorized by the term "Mrs Gren":

http://www.xtremepapers.com/revision/gcse/biology/characteristics_of_living_organisms.php

4. Before watching: The Ss are asked if a tree is a living thing. They are asked the following questions:

- Do trees have cells & grow?
- Do they reproduce and have a genetic code?
- Do they use energy?
- Do they maintain a stable internal environment?
- Do they change over time?
- Do they respond to the environment?

They watch the video (why a tree is a living thing) and are asked to report in class. http://www.youtube.com/watch?v=fcUzxwi6wTo&hd=1

5. Revise characteristics with the PPT.
6. Do the matching activity.
7. Practise collocations through a quiz http://quizlet.com/46510206/biology-collocations-flash-cards/ and

   http://quizlet.com/46510690/biology-verbsnouns-flash-cards/
8. Revise vocabulary through the online M/C questions on: http://quizstar.4teachers.org/instructor/quiz_repository.jsp?pl=qm&cl=qm_ov&qsts=1408990930804# and the crossword.

9. Assignment: Find an example of a living thing and explain (according to the 7 characteristics) why it is a living thing.

ACTIVITY 1

Match the characteristics of living organisms with their function.

Characteristic	Function
Reproduction ( )	**A**. Taking in nutrients which are organic substances and mineral ions, containing raw materials and energy for growth and tissue repair, absorbing and assimilating them.
Movement ( )	**B**. Removal from organisms of toxic materials, the waste products of metabolism and substances in excess.
Nutrition ( )	**C**. Chemical reactions that break down nutrient molecules in living cells to release energy.
Growth ( )	**D**. The ability to detect or sense changes in the environment and to make responses.
Excretion ( )	**E**. Progresses that make more of the same kind of organism.
Respiration ( )	**F**. The permanent increase in size and dry mass by an increase in number of cells, cell size, or both.
Sensitivity ( )	**G**. An action by an organism or part of an organism that changes position or place.

ACTIVITY 2

Characteristics of living organisms

1) Nutrition is when we take in / a_ _ _ _ _ / assimilate nutrients for growth and t_ _ _ _ _ repair.

2) Excretion means r_ _ _ _ _ _ of toxic materials or w_ _ _ products of metabolism by chemical r_ _ _ _ _ _ _ _ in cells.

3) Respiration is breaking d_ _ _ food in cells which r_ _ _ _ _ _ _ energy.

4) Sensitivity means to r_ _ _ _ _ to / sense changes in the environment or s_ _ _ _ _ _.

5) Reproduction is when living organisms produce o_ _ _ _ _ _ _ _ in order to prevent extinction of s_ _ _ _ _ _.

6) Growth means increase in size or m_ _ _ of an organism by increasing cell n_ _ _ _ _ and cell size.

7) Movement is when organisms or p_ _ _ of an organism change p _ _ _ _ _ _ _ _ or place.

ACTIVIY (for lower level students)

The characteristics of living things

All living things must do the following: Move, reproduce and are sensitive e.g. to touch, grow, respire, excrete waste and take in nutrients (eat). An easy way to remember this is by MRS GREN.

Draw a line below to match the picture to the correct characteristic.

Movement

Reproduction

Sensitivity

Growth

Respiration

Excretion

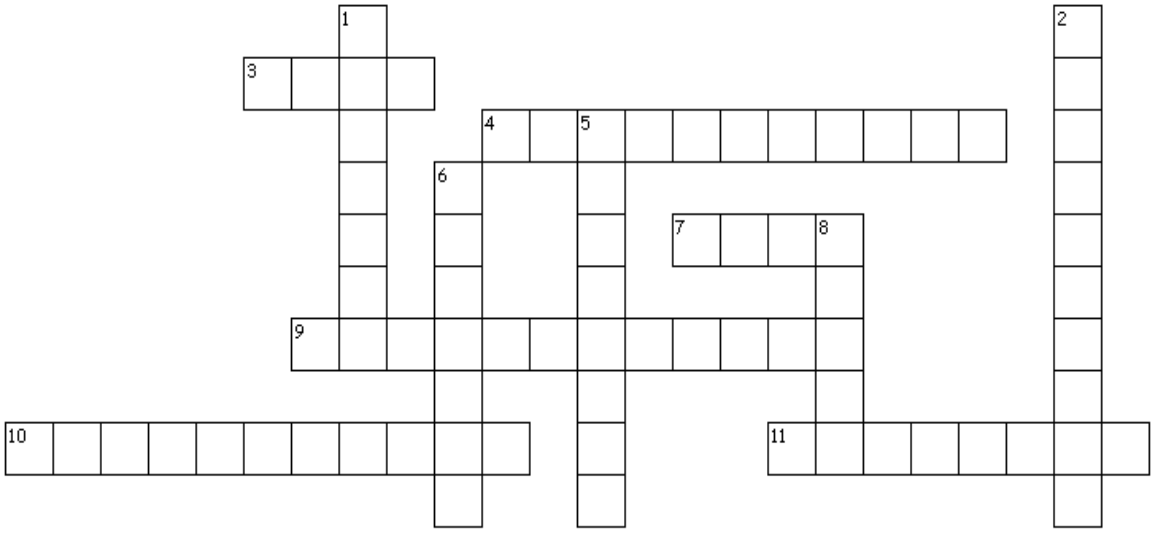
Nutrition

GROUP PROJECT (Go outside in nature, take photos of 5 or 6 living and nonliving things and complete the chart)

Names _____ Living or Nonliving?

Draw or insert a photo of what you found.	Does it **breathe**?	Does it need **energy**?	Does it **move**?	Does it **grow**?	Does it **reproduce**?	Does it **respond** to the environment	Does it **excrete**?	Is it Living?
 **tree**	**Y** It takes in oxygen and releases carbon dioxide	**Y** It needs sun, water, carbon dioxide	Y It moves towards the sun	**Y** It can become a giant oak tree	**Y** An oak tree has acorns	**Y** Many trees close their flowers at night	**Y** It sheds its leaves	**Y**

Biology-Characteristics of Living Organisms



Across

3. the smallest basic unit of a plant or animal

4. breathing

7. the opening at the end of the peptic canal through which solid waste leaves the body

9. the process of having babies, producing young, or producing new plants

10. having a strong physical reaction to something

11. an answer or reaction

Down

1. a type of sugar that is found in plants, especially fruit

2. all the chemical processes in your body, especially those that cause food to be used for energy and growth

5. something that causes part of the body to react

6. to get rid of material such as solid waste or urine from the body

8. an ability to understand, recognize, value, or react to something, especially any of the five physical abilities to see, hear, smell, taste, and feel