

SCIENCE 10 - Lesson 15

STUDENT LEARNING TARGET

WHAT AM I GOING TO LEARN?	HOW WILL I SHOW WHAT I KNOW?	HOW WILL I KNOW HOW WELL I AM DOING – WHAT ARE MY LOOK-FORS?
<p>I AM GOING TO LEARN ABOUT:</p> <ol style="list-style-type: none">1. THE CYCLING OF MATTER IN ECOSYSTEMS2. THE DIFFERENCE BETWEEN ORGANIC AND INORGANIC SUBSTANCES <p>WHY:</p> <ol style="list-style-type: none">1. TO HAVE AN UNDERSTANDING OF THE MAJOR REQUIREMENTS FOR LIFE	<p>I WILL USE A PENCIL AND PAPER TO COMPLETE ANSWERS TO THE QUESTIONS ASKED AND /OR RESPOND ORALLY TO THE TEACHER</p>	<ol style="list-style-type: none">1. I HAVE ANSWERED THE QUESTIONS IN ASSIGNMENT 15.

Atoms, Elements, and Compounds

1. Match the terms in Column A with their definitions by writing the term in the space next to the correct definition in Column B. Use each letter only once.

Column A

atom
proton
element
molecule
electron
compound

Element
electron
proton
molecule
atom
compound

Column B

a pure substance that cannot be broken down into simpler substances
a negatively charged particle outside the nucleus
a positively charged particle inside the nucleus
a pure substance that contains two or more different elements in a fixed proportion
a particle in an element, named from a Greek word meaning "invisible"
a combination of two or more elements

2. Write the chemical symbols for each of the following.

(a) calcium <u>Ca</u>	(h) nitrogen <u>N</u>
(b) carbon <u>C</u>	(i) oxygen <u>O</u>
(c) chlorine <u>Cl</u>	(j) phosphorus <u>P</u>
(d) copper <u>Cu</u>	(k) potassium <u>K</u>
(e) hydrogen <u>H</u>	(l) sodium <u>Na</u>
(f) iron <u>Fe</u>	(m) sulfur <u>S</u>
(g) magnesium <u>Mg</u>	<u>e</u> <u>C</u>

3. Classify each of the following as an element or a compound by writing the correct word in the space.

(a) carbon dioxide	(f) oxygen
(b) hydrogen	(g) nitrogen
(c) carbon	(h) ozone
(d) water	(i) ammonia
(e) calcium	(j) sodium chloride

CYCLING OF MATTER IN ECOSYSTEMS

❖ **LIFE HAS 5 MAJOR REQUIREMENTS FOR LIFE:**

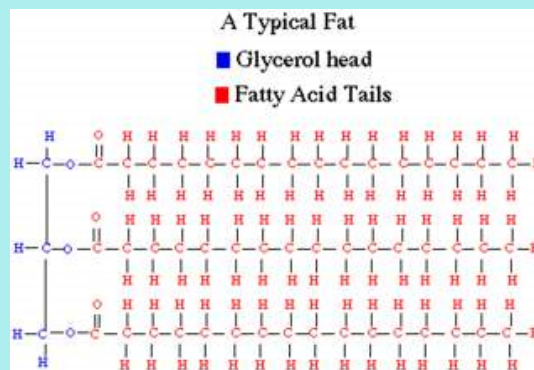
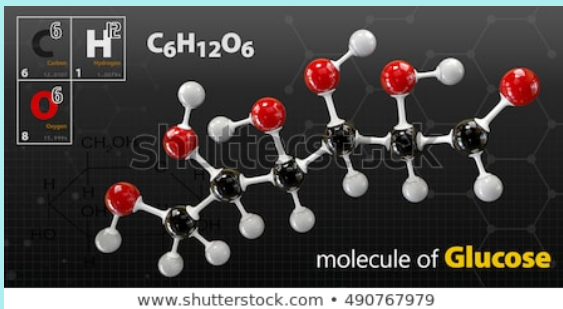
- 1) **ENERGY**
- 2) **WATER**
- 3) **INORGANIC CARBON**
- 4) **OXYGEN**
- 5) **NUTRIENTS**

- **Organisms in ecosystems connect to one another through their need for matter as well as energy.**
- **Every organism needs molecules like proteins, carbohydrates, and fats to provide the raw building materials for their cells.**
- **One of the most fascinating facts about Earth is that almost all the matter on the planet today has been here since Earth first formed.**
- **That means all the carbon, hydrogen, oxygen, nitrogen, and other elements that make up the molecules of living things have been recycled over and over throughout time.**
- **Energy flows but matter is recycled.**

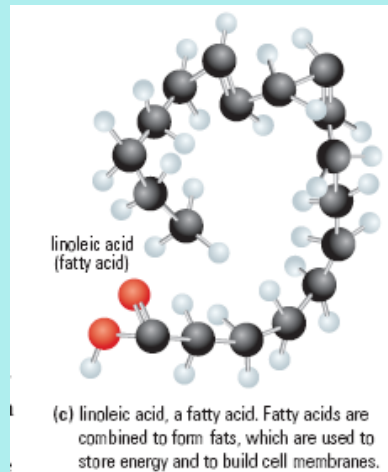
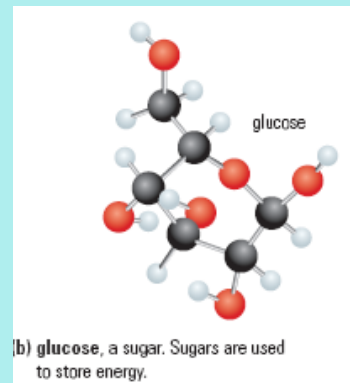
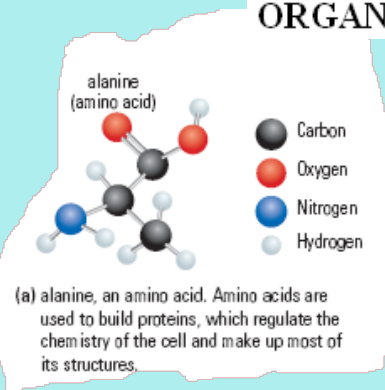
CYCLING OF MATTER IN ECOSYSTEMS

❖ **ORGANIC SUBSTANCES:**

- ALWAYS CONTAIN ATOMS OF CARBON AND HYDROGEN
- OFTEN CONTAIN OXYGEN AND NITROGEN ATOMS
- EXAMPLES INCLUDE PROTEINS, SUGARS, AND FATS



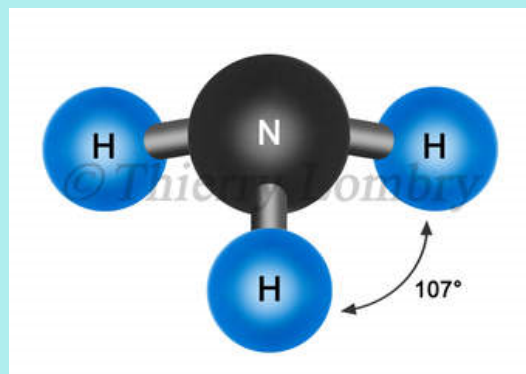
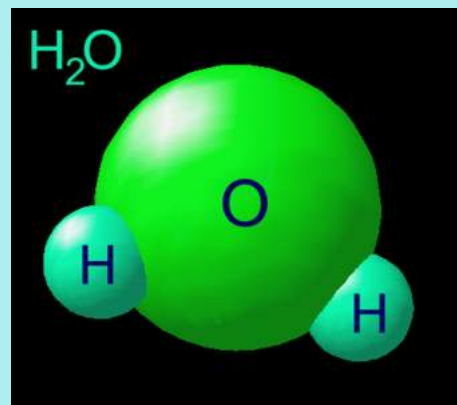
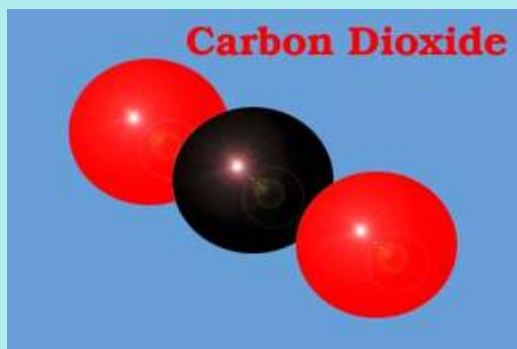
ORGANIC MOLECULES



CYCLING OF MATTER IN ECOSYSTEMS

❖ **INORGANIC SUBSTANCES:**

- DON'T CONTAIN A COMBINATION OF CARBON AND HYDROGEN
- EXAMPLES INCLUDE CARBON DIOXIDE (CO_2), WATER (H_2O), AND AMMONIA (NH_3)

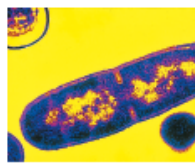


CYCLING OF MATTER IN ECOSYSTEMS

- ❖ **ORGANIC CHEMICALS UNDERGO CHANGES WITHIN LIVING THINGS AND WITHIN ECOSYSTEMS**
- ❖ **THEIR COMPLEX STRUCTURES ARE BROKEN AND REBUILT IN A CONTINUOUS CYCLING OF MATTER.**
- ❖ **MATERIALS IN LIVING ORGANISMS ARE LIMITED TO THE ATOMS AND MOLECULES THAT MAKE UP THE PLANET**
- ❖ **TO MAINTAIN LIFE ON EARTH, MATTER MUST BE RECYCLED**
- ❖ **FOOD IS ORGANIC MATTER**
- ❖ **MATTER CAN BE RECYCLED BY:**
 - **THE DIGESTION OF FOOD IN YOUR BODY**
 - **DECAYING IN DEAD MATTER BY DECOMPOSER ORGANISMS INTO SMALL, INORGANIC MOLECULES**
- ❖ **DECOMPOSERS ARE ABSOLUTELY ESSENTIAL IN THE CYCLING OF MATTER TO RELEASE NUTRIENTS REQUIRED BY THE NEXT GENERATIONS OF ORGANISMS.**

CYCLING OF MATTER IN ECOSYSTEMS

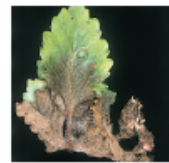
DECOMPOSERS



(a) Bacteria
Several different types of bacteria decompose organic matter. This bacterium lives in the soil.



(b) Bracket fungi
These decomposers feed on dead and living trees, breaking down complex organic molecules into simple ones.



(c) Mould
Another form of fungi. These decomposers feed on organic matter, returning nutrients to ecosystems.

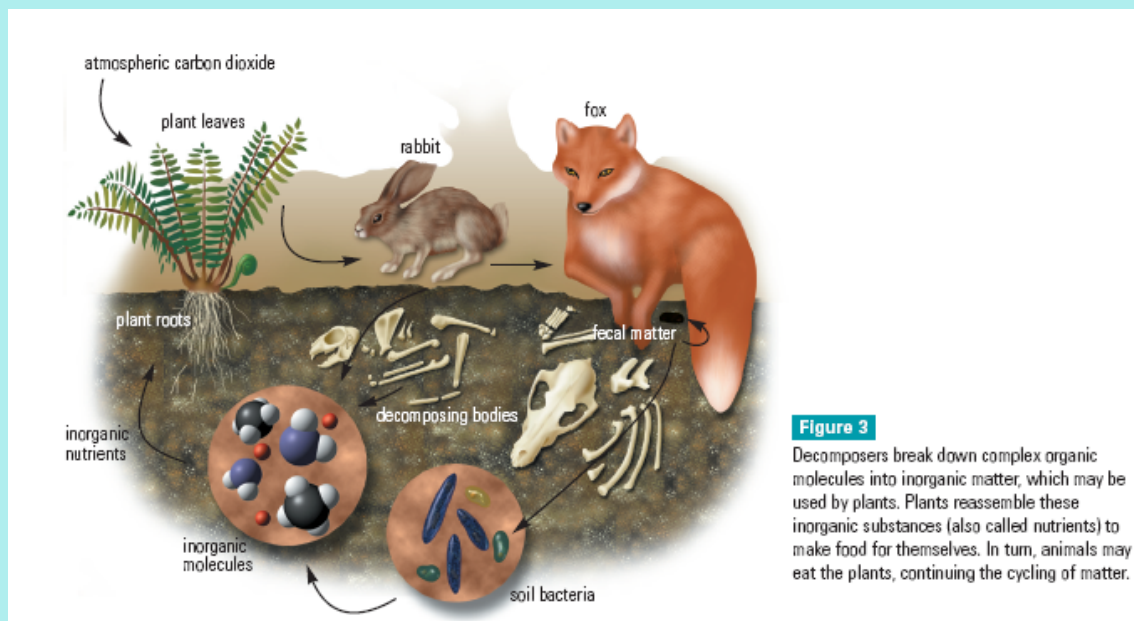




Figure 3

Decomposers break down complex organic molecules into inorganic matter, which may be used by plants. Plants reassemble these inorganic substances (also called nutrients) to make food for themselves. In turn, animals may eat the plants, continuing the cycling of matter.

CYCLING OF MATTER IN ECOSYSTEMS SCIENCE 10 ASSIGNMENT 15

1. What are the 5 requirements for life?
2. What is the difference between an organic and an inorganic molecule?
3. Water is an example of an organic molecule. True or False.
4. Food is an inorganic substance. True or False.
5. Describe 2 ways matter can be recycled.
6. _____ are absolutely essential in the recycling of matter.
7. What are 3 examples of the organisms in question 6.

Attachments

-  The importance of predators, the Yellowstone case
-  A WAR ON THE WOLF