

DLT 1.1

What is Life?

What makes something living?

There are some basic characteristics of all living things.

An **organism** is any living thing that has the basic characteristics of life.

1. Cellular Organization

Organisms may be composed of one cell (**unicellular**) or multiple cells (**multicellular**).

Cells are specialized in multicellular organisms to perform specific tasks in order to keep the organism alive.

Ex: bone cells, brain cells, skin cells, blood cells

2. Chemicals of Life

Cells are made up of chemicals. Living things need certain chemicals to stay alive.

Carbohydrates are a food source. Nucleic acids make your DNA. Proteins and lipids help build cells.

What chemicals do YOU need to survive?

3. Energy Use

All organisms get energy from taking in and breaking down materials. This process is called **metabolism**.

Living things must have energy to survive.

4. Response to Surroundings

Organisms respond to their surroundings. Any change that causes an organism to react is called a **stimulus**.

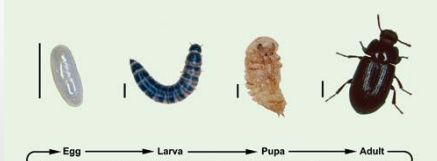
Ex: plants grow towards light and respond to gravity!



5. Growth and Development

All living things grow and develop. Duh.

Development refers to the changes in an organism over time producing a more complex organism.



6. Reproduction

All organisms reproduce to make offspring.

Asexual reproduction involves only one parent like a bacteria dividing in two.

Sexual reproduction involves two parents combining genetic material to produce offspring.

Vertebrate animals and most plants reproduce sexually.

Where do living things come from?

All living things come from other living things through the process of reproduction.

Spontaneous generation was the belief that organisms could appear from nonliving materials.

i.e. rotting meat produced maggots & flies.

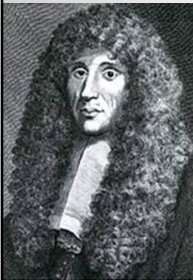
Francesco Redi & Louis Pasteur

These guys conducted **controlled experiments** to disprove the theory of spontaneous generation.

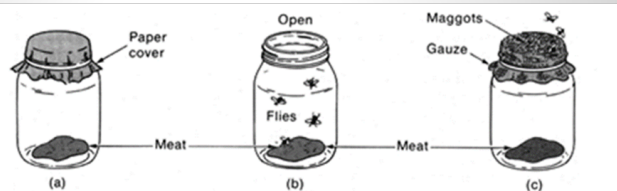
Redi used meat, Pasteur used beef broth. Both used open and closed systems to show that in a closed system, no decay occurred. Only in an open system did decay/flies appear.



Redi's Experiment:

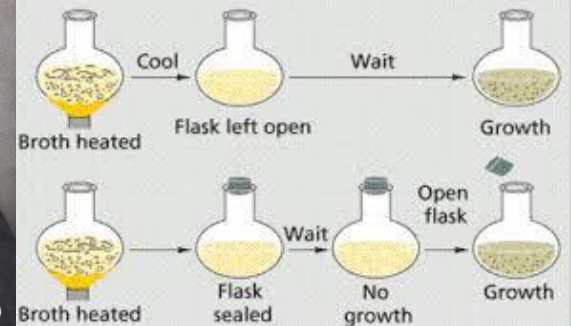
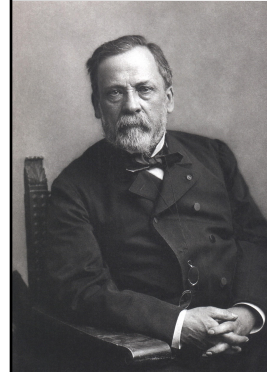


Francesco Redi
(1626-1697)
(Author unknown, 2010)



(Priest, 2009)

Pasteur's Experiment:



Needs for Survival

All living things need:

- Food
- Water
- Living Space
- Stable Internal Conditions

FOOD

Organisms need a source of energy to live. They use FOOD as their energy source.



Autotrophs

They are self-feeders. They make their own food like a plant. Some single celled organisms are also autotrophs. Photosynthesis!



Heterotrophs

Cannot make their own food, so they must eat something else to get their energy.

Ex: Humans, Lions, birds, any carnivores or herbivores....



Water

we all need water to survive. Duh again.

Organisms need water to obtain chemicals from their surroundings, break down food, grow, move substances within their bodies, and reproduce.

Living Space

All organisms need a place to live - a place to get food, find shelter, water, etc...

Due to limited space, organisms must compete for living space. Trees compete for sunlight in a forest and some animals are territorial.

Stable Internal Conditions

Homeostasis! Some animals have the ability to maintain their internal body temperature Ex. mammals & birds. Some organisms do not have this ability! Ex. plants, cold-blooded animals such as fish, reptiles and amphibians.

Some organisms must control conditions such as amounts of water. (frogs, worms, plants)

Write your summary!