

CHAPTER 1 –LIVING THINGS AND THEIR LIFE PROCESSES

What are the Life Processes in Humans and Animals?

What are the Life Processes in Plants?

How can we tell Living Things from Non-living Things?

WHAT ARE THE LIFE PROCESSES IN ANIMALS & PLANTS?

1. Define Life Processes.

Life processes are the *series of actions* that are essential to determine if an animal is alive.

2. What are the Life Processes?

There are *seven* essential processes in common: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition or MRS GREN.

3. Does all living things exhibit MRS GREN?

Yes, anything that is alive (animals, plants, humans) *MUST* demonstrate *all* seven of these processes!!

For e.g. plants can tell in which direction the Sun is in, and know the difference between up and down! They are capable of movement.

4. All about **MRS GREN**

M - Movement → All living things move, even plants

R - Respiration → Getting energy from food

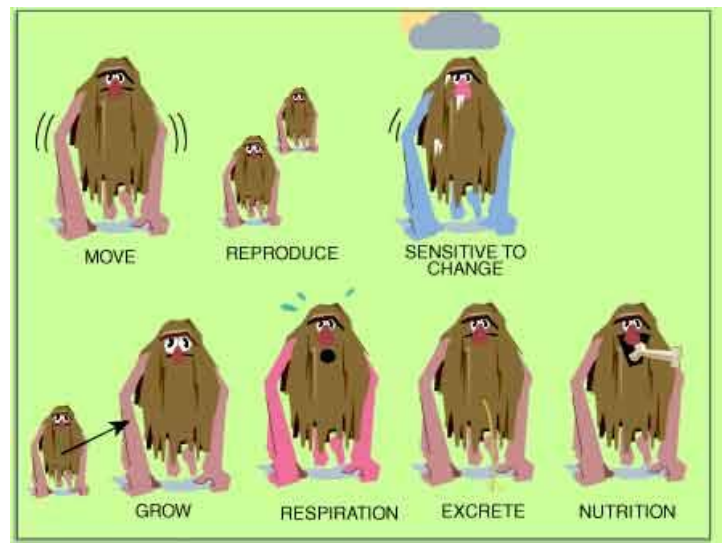
S - Sensitivity → Detecting changes in the surroundings

G - Growth → All living things grow

R - Reproduction → Making more living things of the same type

E - Excretion → Getting rid of waste

N - Nutrition → Taking in and using food



<http://othcy9science.wikispaces.com/MRS+C+GREN>



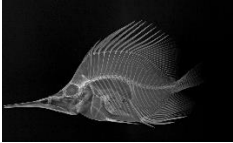
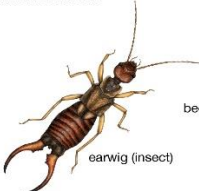




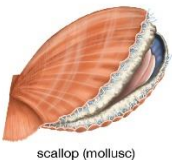




5. Is there any other characteristics that living organism satisfy?

Some scientists have named the 8th characteristics which is:-

C - Cells → All living things have cells.

Movement

- i. Animals do this to look for food and shelter, and to escape from danger. They can move because their bodies are supported by:

Type	Features	Examples
Endoskeleton	<ul style="list-style-type: none"> Bones/Cartilage are inside Grows as animals grow 	  
Exoskeleton	<ul style="list-style-type: none"> Hard outer shells Does not grow Shed and replaced 	<div> <p>chitin exoskeleton</p>     </div> <div> <p>calcium carbonate exoskeleton (shell)</p>   </div> <p>© 2013 Encyclopædia Britannica, Inc.</p>
Hydrostatic	<ul style="list-style-type: none"> No bones Internal fluids held within body 	   

- ii. Plants move towards sunlight, roots grow into the soil. They move slower than animals.

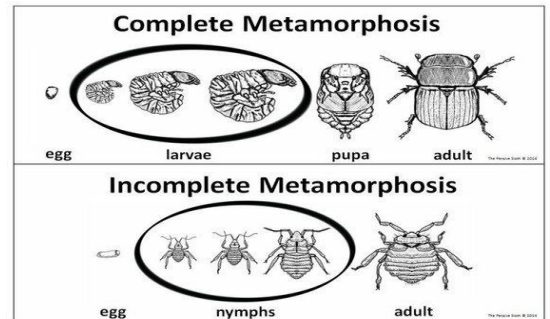
Reproduction

Living things do this so that they will not become extinct.

i. Animals have babies from:

- giving birth
- laying eggs
- asexual reproduction (e.g. Hydra jelly fish sprout babies like buds growing from parent's body).

Baby animals can resemble mini adults or some will undergo partial/complete metamorphosis.



ii. Plants grow from :

• Seeds

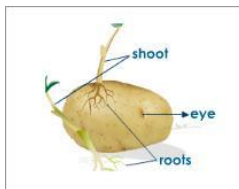


• Spores (ferns & mosses)

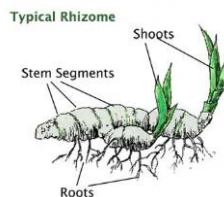


• Asexual

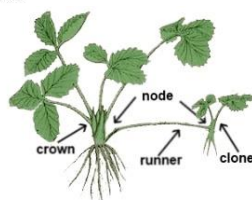
- tubers (potatoes)



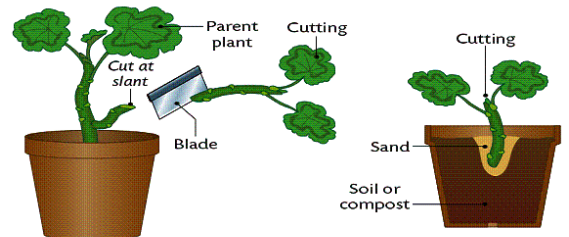
- rhizomes (onions, ginger);



- runners (strawberries)



• Plant grafting & budding.



Sensitivity

Living things notice and react/respond to changes around them.

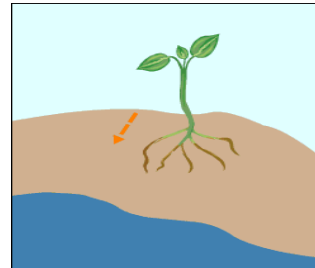
i. Animals use their five senses:

- Sight (eyes)
- Hearing (ears)
- Smell (nose)
- Touch (skin, feelers)
- Taste (tongue)



ii. Plants are also sensitive to their surroundings:

- Gear towards sunlight and water



- Respond to touch (e.g. the Venus Flytrap & Mimosa).



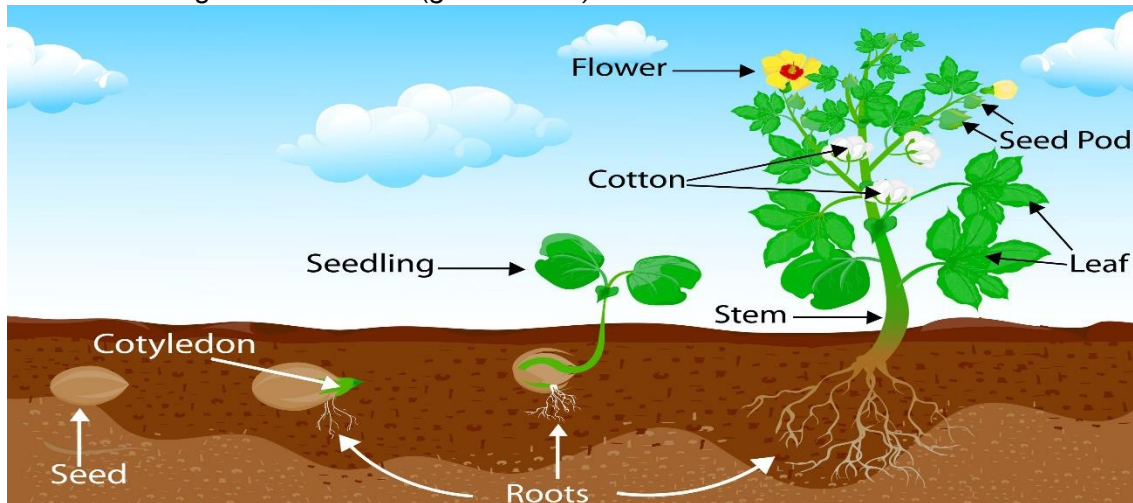
Growth

A living thing gets bigger, taller and heavier over time.

- i. Animals grow at a fairly steady pace until they reach adulthood. Every day as they get older their bodies are changing. Their skeleton grows with them, each bone getting bigger over time.

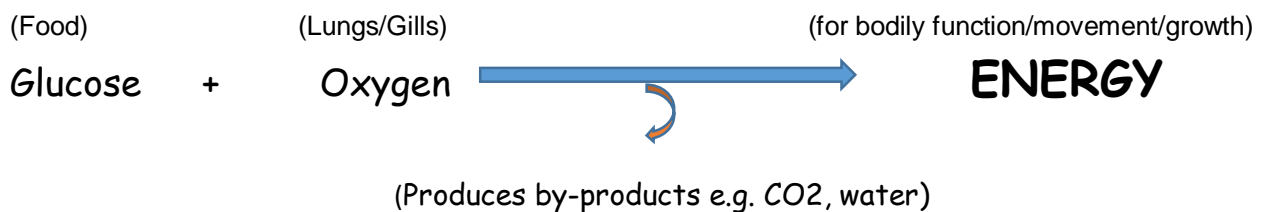
Arthropods - insects, spiders, crabs and other animals with external skeletons – grow by shedding their skeleton and grow a new one!

- ii. Plants – most grow from seeds (*germination*)



Respiration

- i. The process by which nutrients taken in are converted to energy. Respiration is a *chemical reaction* and occurs in every cell in living things.



- ii. Plants respire all the time because their cells need energy to stay alive, but plants can only photosynthesize when they are in the light.

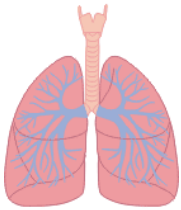
* respiration is the opposite of photosynthesis.

Time of day	Photosynthesis	Respiration
Day	Active	Active
Night	None	Active

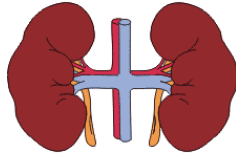
Excretion

The process by which waste materials produced by the body are removed.

- i. In animals, excretion gets rid of carbon dioxide, water and harmful substances (the by-products of respiration) from your body.



Excrete carbon dioxide as you breathe out.



Filter out nasties to produce urine, removing nitrogen waste from your body.



Sheds excess salt through sweat.

Types of Human Excretion

- ii. Plants break down waste products at a much slower pace than animals. During:
- Respiration (night) \longrightarrow Carbon dioxide + Water (*transpiration)
(stomata and root cell walls) (tips of the leaves)
 - Photosynthesis (day) \longrightarrow Oxygen (stomata, root cell walls and other routes)

Other plant wastes include resins, saps, latex and tannins (released into the soil surrounding the plant; leaves and flowers fall off of a plant)



Types of Plant Excretion

Nutrition

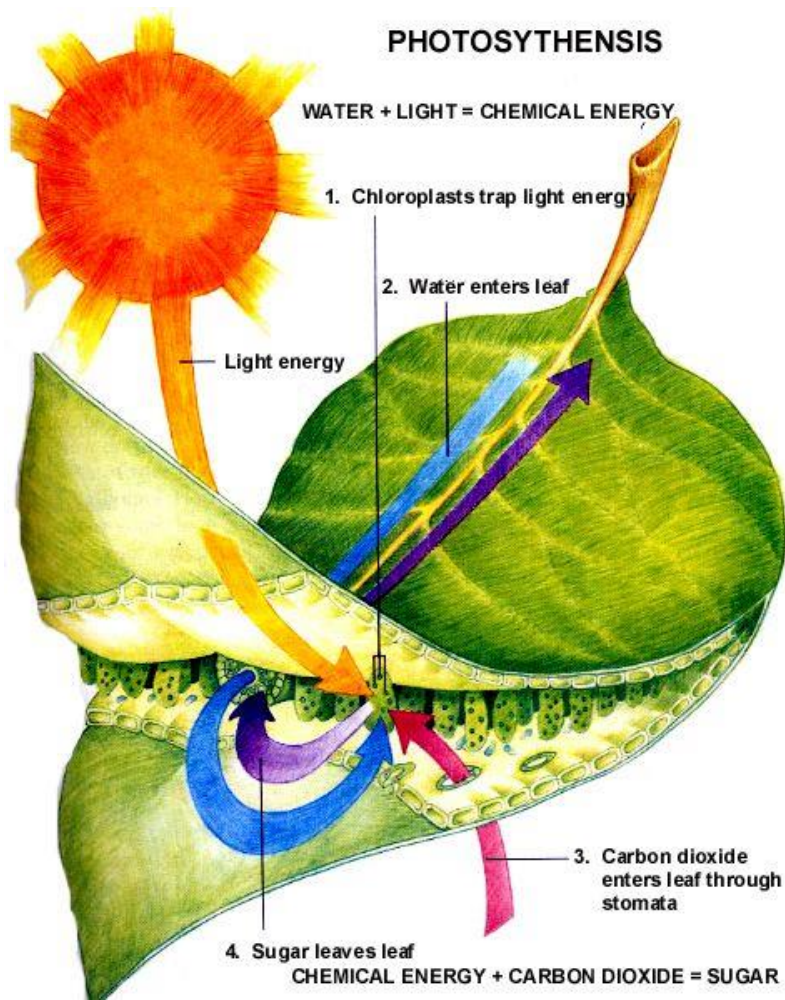
- i. Animals get nutrients to survive:
- From food and water
 - By hunting

Animals can be categorized into the type food they eat:

Carnivores	Herbivores	Omnivores
Eat only meat	Eat only plant sources	Eat both meat and plants

- ii. Plants 'make' own food get nutrients by:
- absorbing them from the *soil*
 - forming sugars through *photosynthesis*.

Photosynthesis = light energy + carbon dioxide and water $\xrightarrow{\text{convert into}}$ sugar.
(+ pigment Chlorophyll) (sun)



Photosynthesis

HOW CAN WE TELL LIVING THINGS FROM NON-LIVING THINGS?

6. How do we differentiate living and non-living things?

By investigating whether it undergoes ALL life processes. Living things are made up of cells and regulate internal conditions e.g. body temperature (*homeostasis*)



CONCLUSION:

Living Things may refer to:

- Life that have self-sustaining processes (biology)
- Organisms with living systems (such as animals, plants, fungi, or micro-organisms)