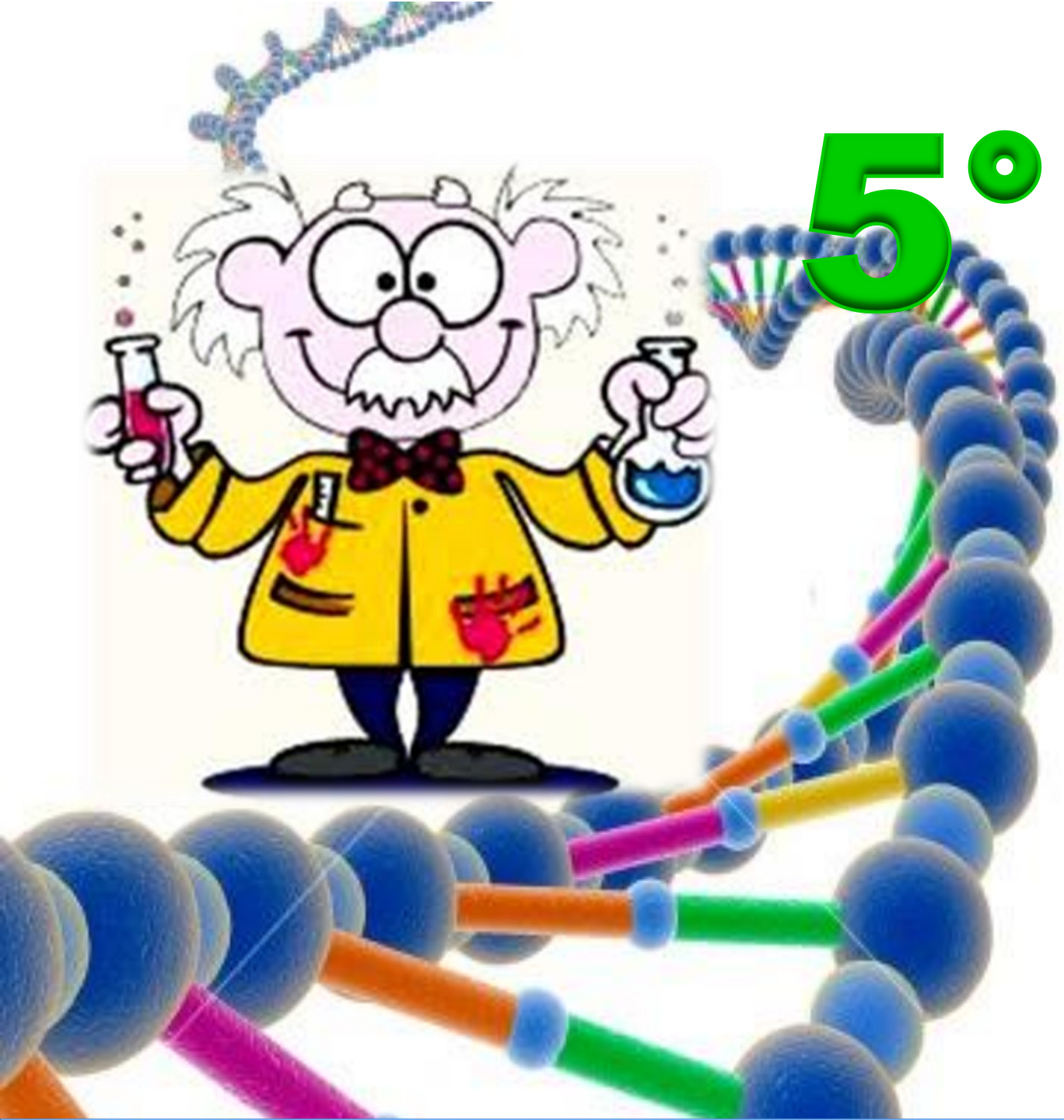
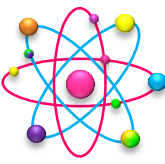


5°



**Science**



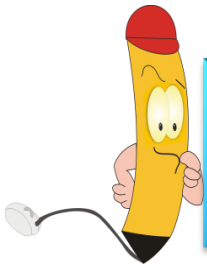
# Know the contents

The Miami Virtual School, presented through texts for elementary education program and sequence of natural science content, enriched with several videos and subtopics. With this text handling you acquire attitudes, skills, abilities and concepts that allow you to expand your worldwide.

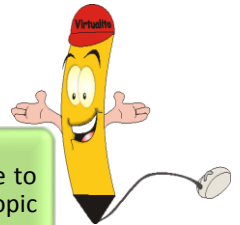
Your contents are grouped into four sessions containing topics and subtopics of several pages. Each topic begins with a title, a series of questions whose purpose is to arouse your interest in the contents, you can use these questions at the end of a topic to test your learning. You'll find images related to the concepts and themes, videos, charts, concept maps with didactic sense

The virtualitos help you journey through this adventure of knowledge.

## Inquire to...



When you find this icon you know that there are many unanswered questions, which you can use at the end of a topic to find what you have learned.



When you find this icon you have to carry out the activities for each topic or subtopic.



Art is part of your activities, giving a personal touch when you go to color. Now you are the artist!

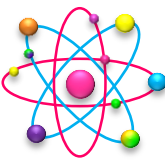


Virtualito invites you to learn more about the theme, research new things. That's interesting to know!



Did You know that...?  
You'll find fun facts that invite you to learn about other related topics





# Vital functions of living things

Living things must perform functions that enable them to maintain living conditions. Vital functions are nutrition, breathing, circulation and excretion, among others.

## Nutrition

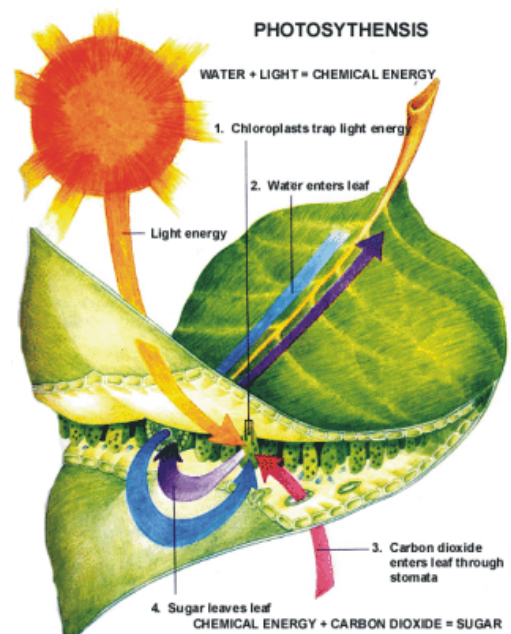
All living things perform the function of nutrition, from the most complex to the simplest. Through nutrition all living matter taken from the external environment and expel waste substances.

The organisms that make their own organic matter are called autotrophs, and those who take from the environment, heterotrophic.

## Nutrition in plants

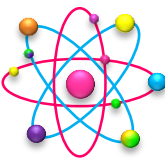
Own nutrition is autotrophic plant and comprising the following steps:

Incorporation of nutrients from the medium: The main plant nutrients are inorganic molecules, such as water and mineral salts, and roots absorb carbon dioxide, which incorporates directly the sheets.



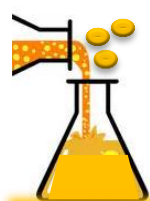
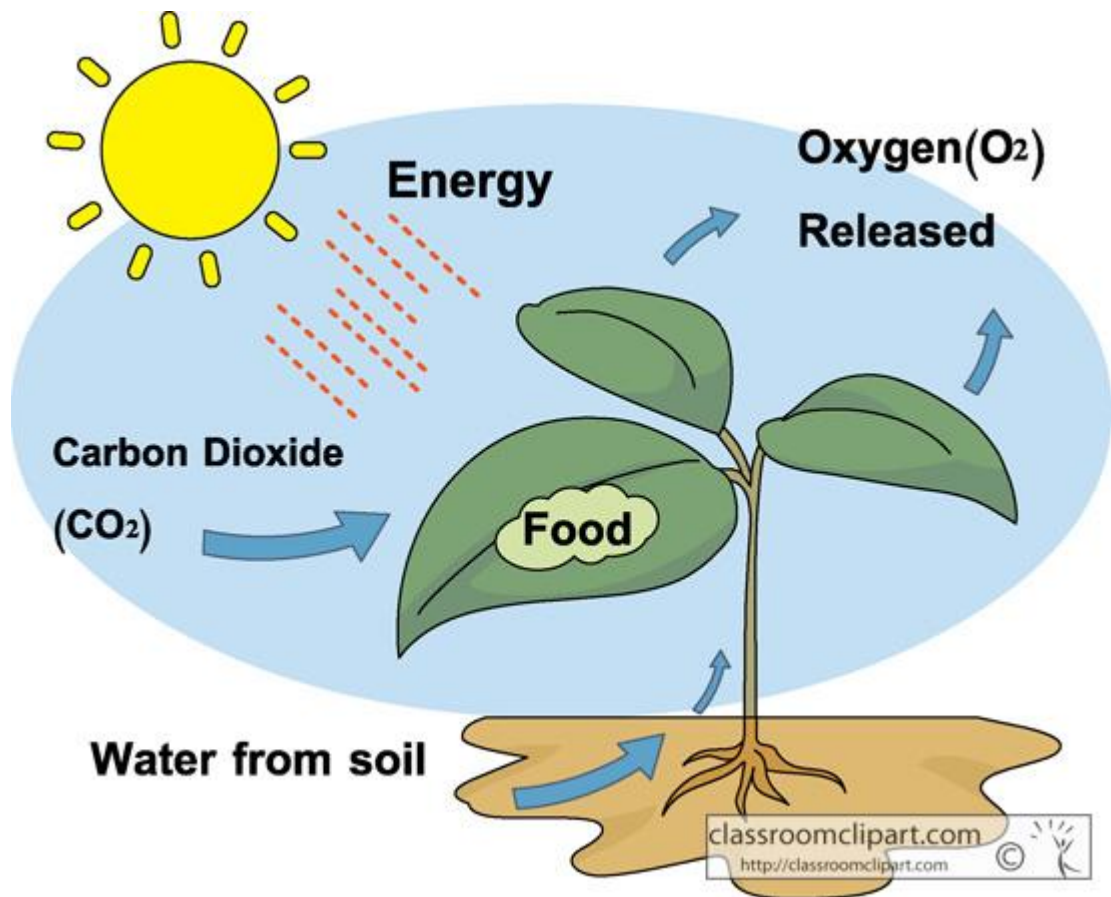
Production of organic matter: The name photosynthesis takes place in the chloroplast of the plant cell where chlorophyll is responsible for capturing the energy of sunlight. Along with nutrients this energy is used to produce organic matter. In this process oxygen is evolved.

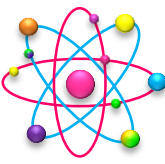




Using the organic material: Material used for plant growth (cell regeneration) and also for breathing process that takes place in the mitochondria, and that provides the energy that the plant needs to continue to absorb the mineral salts, interact with the environment and perform their vital activity.

Elimination of waste substances (excretion): Eliminate substances that can be harmful.





## Nutrition in animals

The animals are living beings who do not have the ability to perform photosynthesis, so their nutrition is heterotrophic.

Some unicellular organisms feed on other unicellular organisms or organic matter from the environment to develop its own material and perform vital functions.

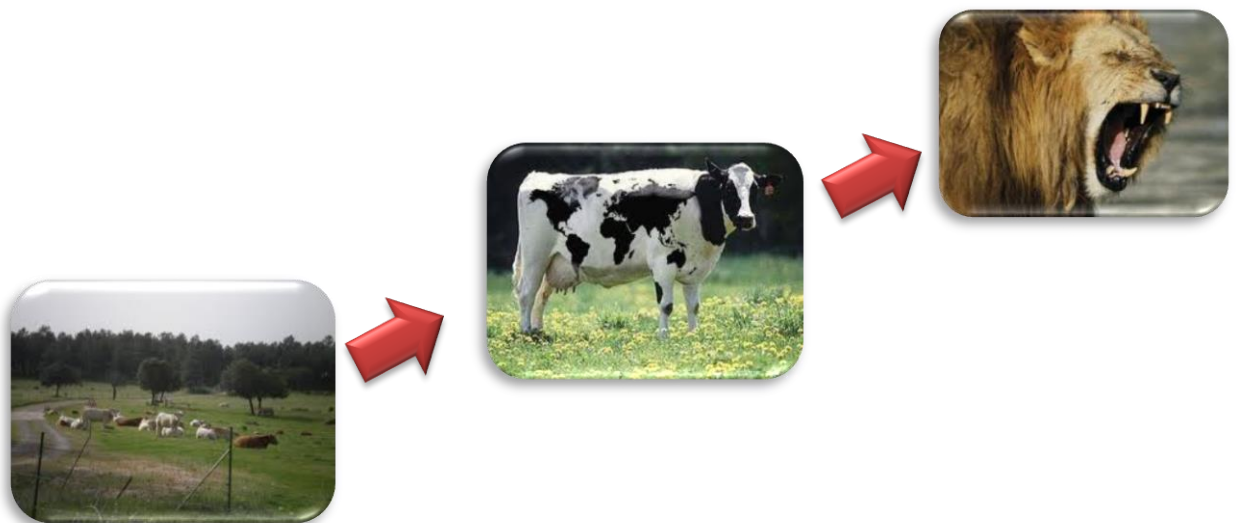
Heterotrophic nutrition found in the following phases:

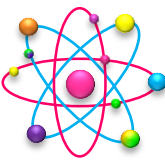
**Incorporation of organic matter between:** multicellular organisms need a digestive system that transforms the food eaten in simple molecules that cells can use. These molecules are then transported through the circulatory system to the cells.

**Using organic matter:** With the new structures are generated nutrients and cellular respiration energy is obtained to keep the body functioning.

**Elimination of waste substances to the environment (excretion):** Substances that are removed are not required for cells or that have been generated in the transformation of matter.

Nutrition examples:

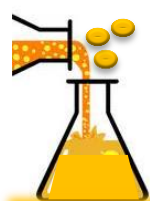
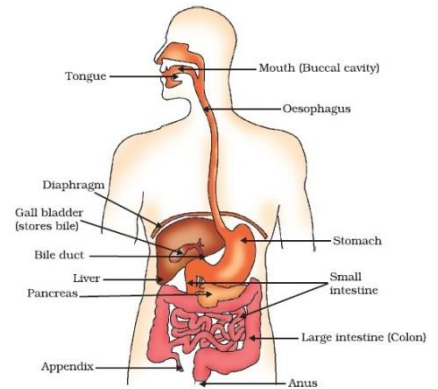


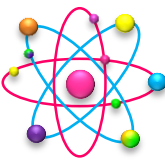


## Nutrition in humans

Humans feed on products from all the kingdoms of nature. In addition to the structures that you know the digestive system, human beings have a number of attached glands that include the liver, pancreas and salivary glands.

The liver secretes bile, the pancreas secretes pancreatic juice and salivary glands secrete saliva. These three substances are mixed with food in various parts of the digestive system which facilitate digestion.



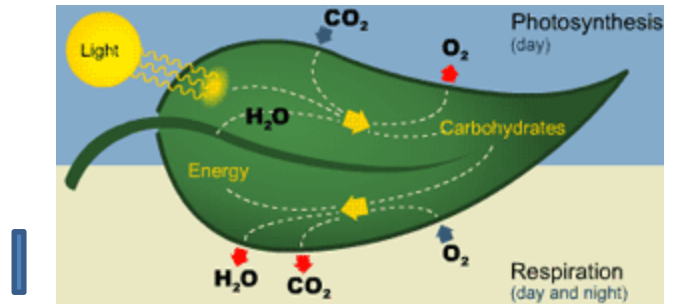


# Breathing function

Respiration is the process by which living things use atmospheric oxygen ( $O_2$ ) to extract energy from food. As waste material, this process produces carbon dioxide  $CO_2$ .

## Respiration in plants

Oxygen inlet and outlet of carbon dioxide is effected through the stomata, whole cells that are opened and closed according to the need of the plant.



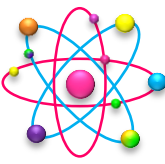
## Breathing in animals

Breathing may be cutaneous, gill tracheal or pulmonary, according to the medium in which they inhabit.

cutaneous Respiration

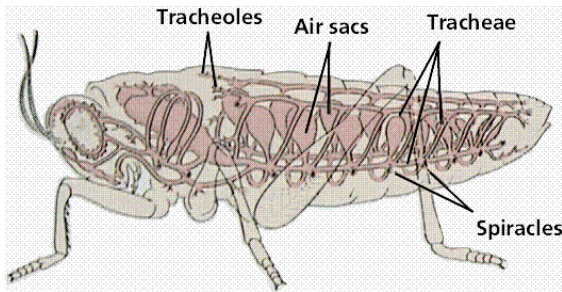
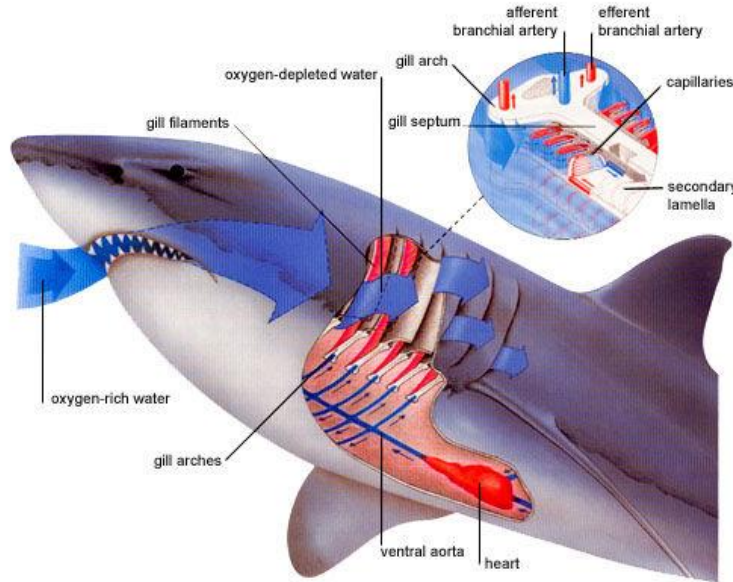
Is the exchange of gases occurs through the skin. For this to be possible, the skin should be very moist. This type of breathing is provided in animals like snails and all amphibians





## Gill Breathing

Is the exchange of gases occurs in a structure called gills irrigated by many blood vessels and located near the head. This type of breathing is in aquatic organisms such as fish.

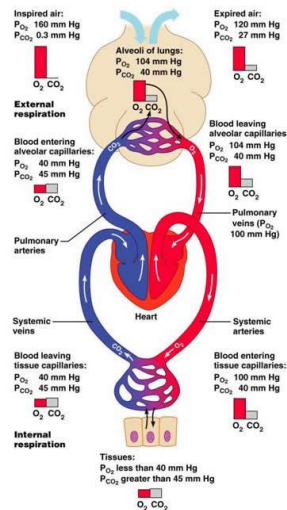


## Breathing tracheal

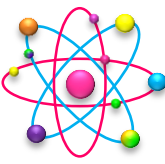
Gas exchange is realized through branching tubes called tracheae that communicate with the outside through a pair of small pores called spiracles. This type of breathing is typical of insects and spiders.

## pulmonary Respiration

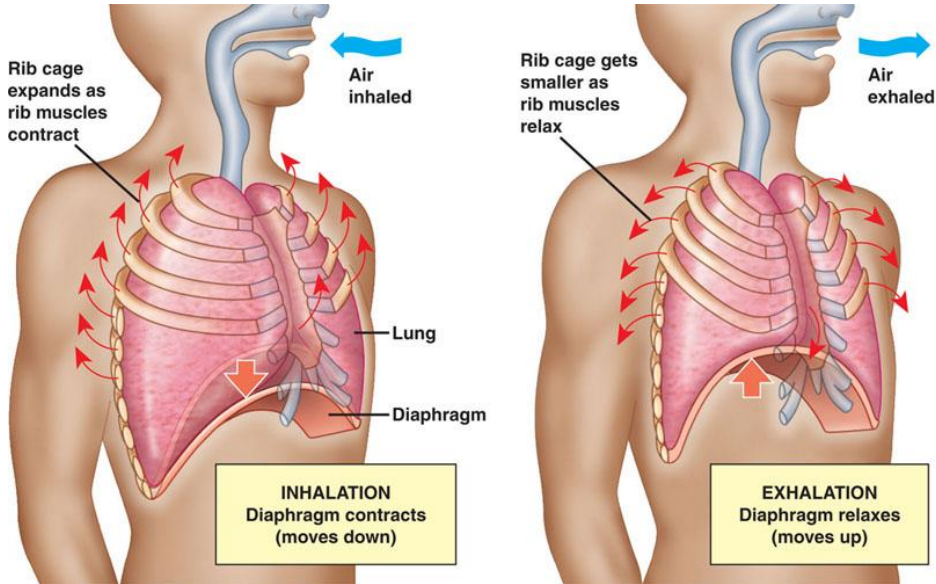
Is the exchange of gases occurs in a bag-shaped organs called lungs, which have a large amount of blood vessels. This type of breathing occurs in mammals.







## Breath of human



The human respiratory system is very similar to that of other mammals.

The journey that makes the air inside our body is as follows:

Air enters through the nostrils, which are two small cavities lined by villi. Its function is to trap particles that arrive with the incoming air.

Continue through the pharynx and larynx. The pharynx is a shared body through the digestive system, controls the passage of food and air with a structure called the epiglottis. Larynx is the vocal cords are located.

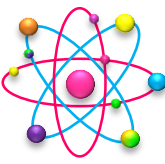
Continues through the trachea, which is a conduit which is then divided into two branches called bronchi

The bronchi branch into thin tubes called bronchioles, which allow the passage of air into the lungs.

The lungs are two large and fluffy bodies, formed by the alveoli, which are tiny pockets where gas exchange takes place: the oxygen contained in the air we breathe into the blood, the carbon dioxide content in the blood goes to air exhale.

This whole process is done in two motions are:

Inspiration or inhalation  
Expiration or exhalation



# Circulation function

Circulation is to transport nutrients and gases through a duct system to all body parts.

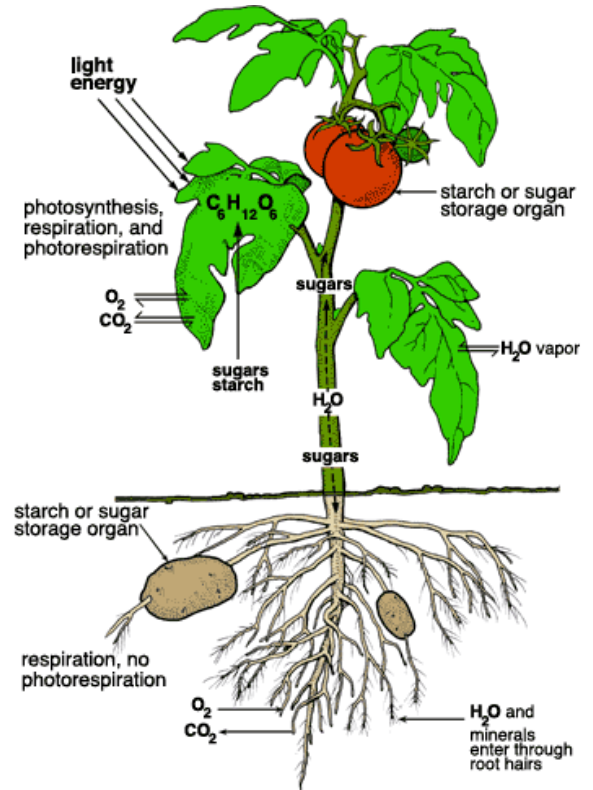
## Circulation in plants

Plants have two types of tissue, the xylem and phloem, which serve to distribute nutrients, water and gases for the whole plant.

The xylem transports water and minerals, ie crude sap from the roots to the leaves.

In leaves crude sap becomes sap produced, whereas the process of photosynthesis.

The elaborated sap is the food of the plant, is distributed from the sheet by all parties through the phloem.



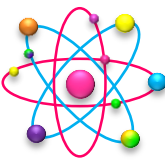
## Circulation in animals

Animals have heart, blood vessels and blood. They fit together and form the circulatory system in animals, can be open or closed.

The open circulatory system: no capillaries. Blood is driven through the heart vessels and flows into gaps called hemocelicas spaces. The insects, crabs, snails and spiders have this type of movement.

The closed circulatory system: has several capillaries that connect the veins and arteries, the blood always flows within the vessels. This system is typical of vertebrates and some invertebrates such as earthworms.

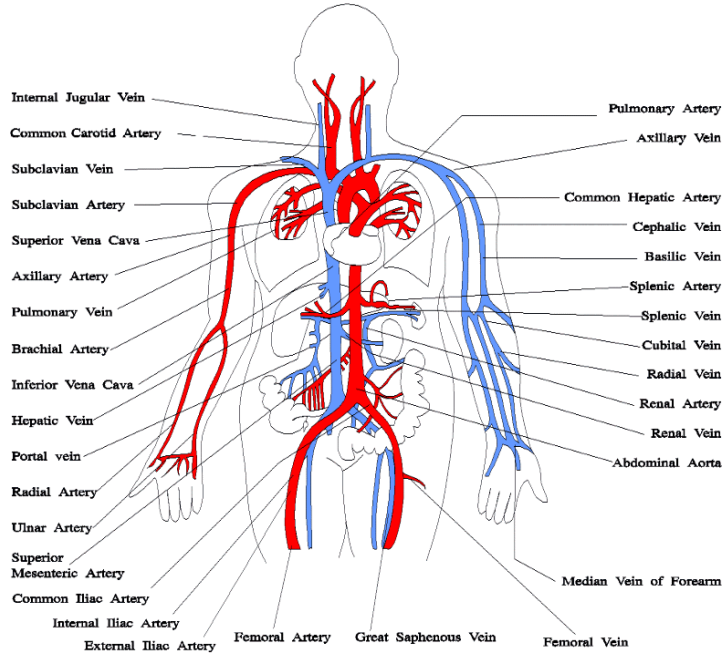




## human Circulation

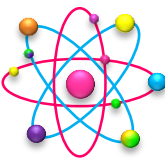
The circulatory system in humans is closed and consists of the heart, blood vessels and blood.

### Blood Circulation Principal Veins and Arteries



The heart pumps blood through the arteries to reach your entire body. Blood carries food substances that come from the digestive system and oxygen from the respiratory system. The capillaries connect the arteries with the veins, you lift the oxygen and nutrients to every cell and collect the waste. The heart pumps blood to the lungs, there leaves the carbon dioxide and picks up oxygen for its journey again. The blood loaded with carbon dioxide back to the heart through veins





## EXcretory function

Excretory function is the last process of the function of nutrition, excretory performed but is also involved other organs. It takes place in three phases:

Filtration: The cough catabolites separate fluids with large amounts of water and other soluble components but useful (glucose, mineral salts, etc.).

Selective reabsorption: readmitted in blood most of the first filtered water and a part of the salts and other soluble compounds;

Secretion: Takes place the elimination of urine, ie excess liquid and useless, through appropriate emunctories.

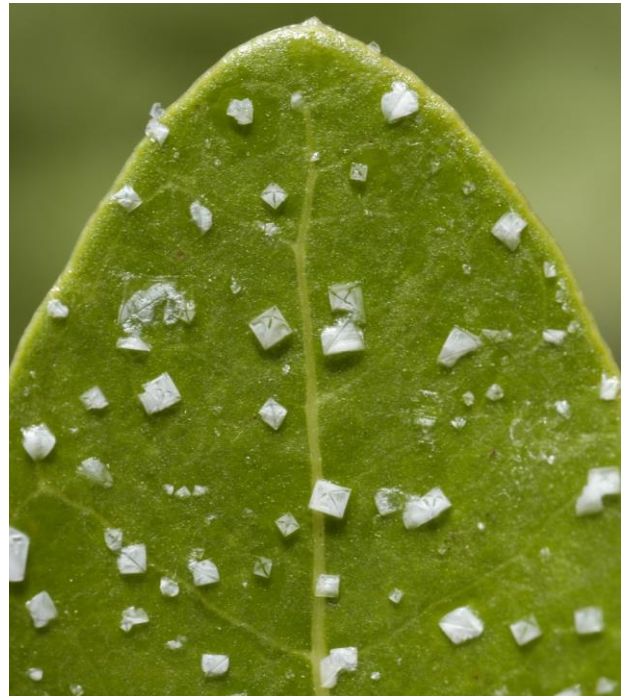
## Excretion in plants

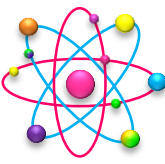
Plants remove substances through specialized glands, stomata and laticíferos tubes.

Glands, allow the removal of substances such as salt.

Stomata allow perspiration, ie the water outlet in the form of steam when the plant requires it.

Laticíferos tubes, allow the waste outlet conveyors on a milk-like substance called latex.





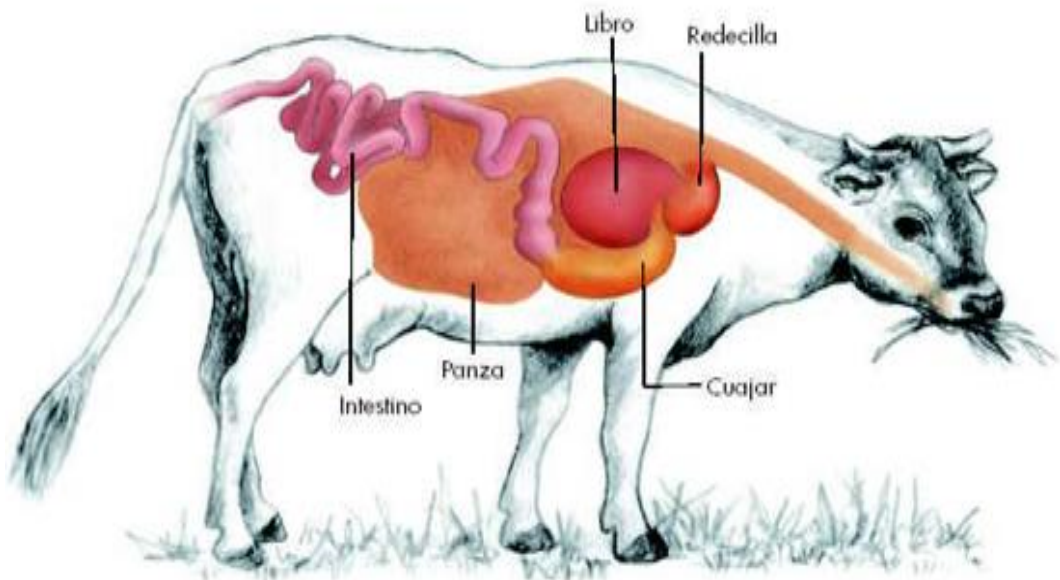
## Excretion in animals

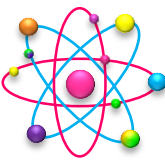
Animals in the excretory system is composed of nefridios, malpighian tubes and kidneys.

The nefridios are tubes with two ends: one that collects the waste, and another outside the animal excreta through pores. They are present in snails and earthworms.

Malpighian tubes are tubes that collect waste and transform it into a substance called uric acid which is deposited in the intestine and then excreted along with feces. They are present in spiders and insects.

The kidneys are complex organs composed of thousands of tubules called nephrons, which filter the blood to form urine. They are the excretory organs of vertebrates.





## human excretion

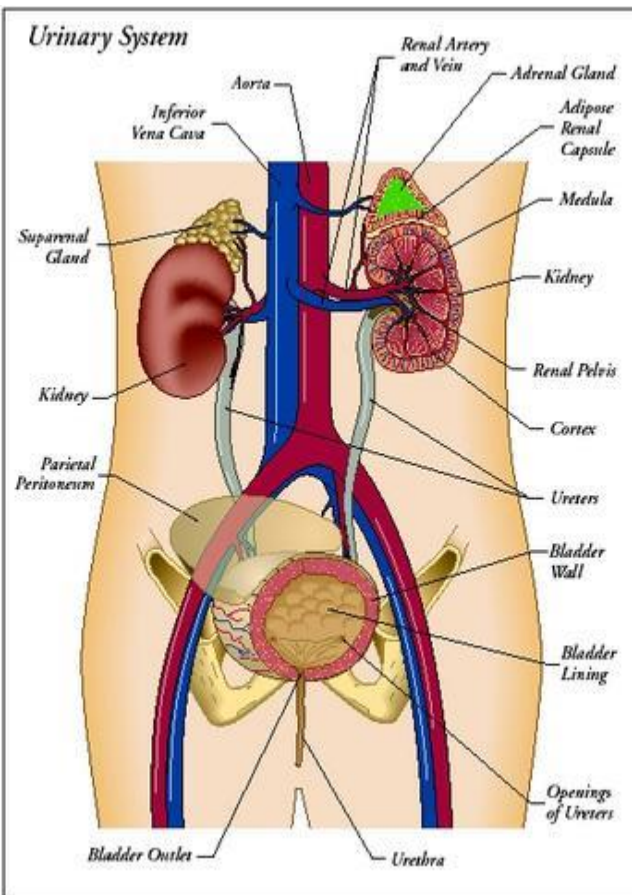
In humans waste substances are removed through the excretory system. In addition to the lungs, urinary system and skin act as filters to purify the blood.

The excretory system consists of the kidneys, ureters, bladder and urethra.

The kidneys: two bean-shaped organs that receive blood full of impurities and leaves to continue the flow clean. Water and waste removed will form urine.

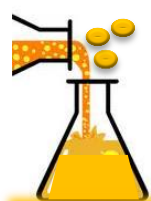
The ureters are two tubes coming out of the kidneys and carries urine to the bladder

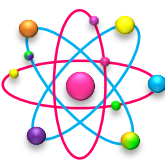
The bladder is a pouch-shaped organ that stores urine.



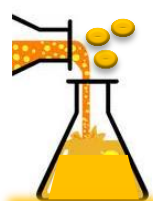
Urethral conduit is responsible for transporting the urine to the outside of the body.

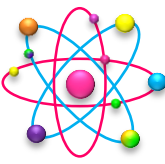
Besides the excretory system, skin also acts as a body excretion, thanks to the presence there of the sweat glands, responsible for excreting minerals and water as sweat. These glands are found throughout the body, but are most abundant in the face, underarms, palms of hands and soles of the feet.





## Water cycle

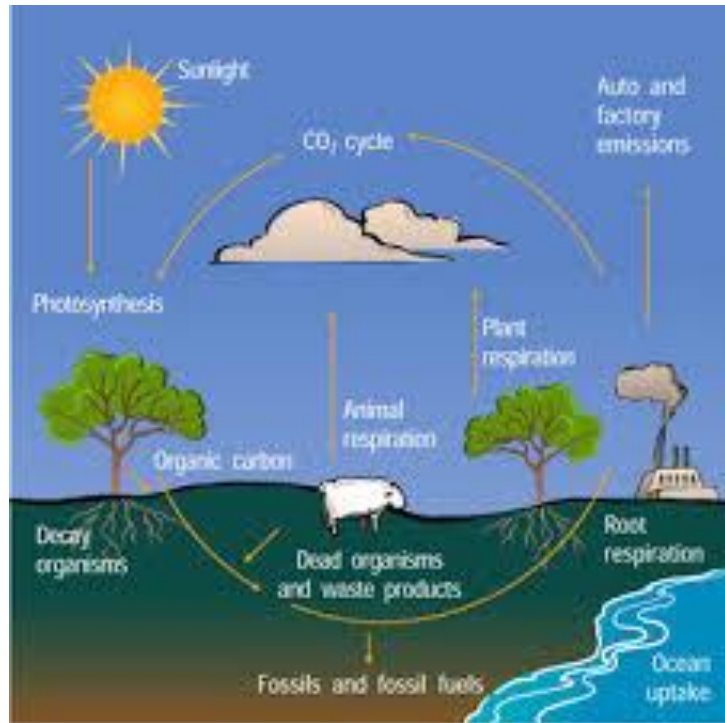




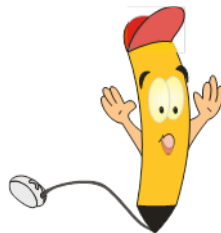
## Carbon Cycle

El carbón es un elemento que forma parte de los océanos, el aire, las rocas, los suelos y los seres vivos. El carbón no permanece en un mismo lugar, ¡siempre está en movimiento!.

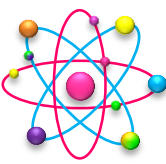
El carbón va de la atmósfera a las plantas, de las plantas a los animales, de las plantas y animales al suelo y de los seres vivos a la atmósfera.



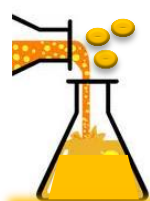
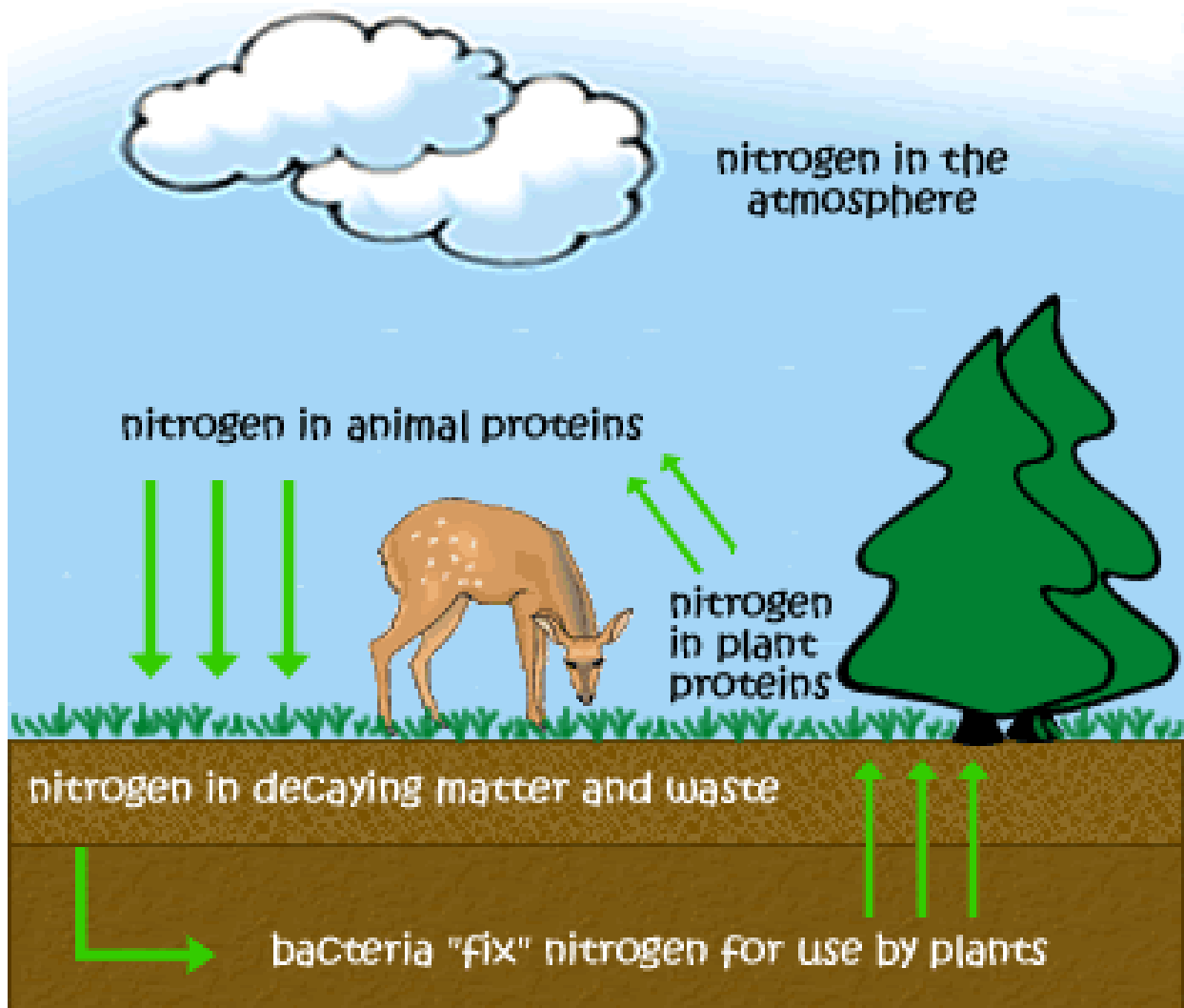
Coal is fossil fuels into the atmosphere when the fuel is burned. • When humans burn fossil fuels to power their factories, power plants, cars and trucks, most coal penetrates rapidly into carbon dioxide gas.

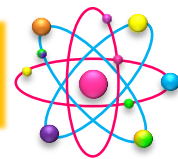






## Nitrogen Cycle





# Glossary

