

ANIMALS. INVERTEBRATES.

1. INVERTEBRATES.

Invertebrates are a group of animals characterized by:

- a) They **have no backbone** or internal skeleton.
- b) They **have no skeleton** or they have **exoskeleton** (esqueleto externo).

It is a group of animals that is divided into several subgroups to facilitate their study based on the **similarities and differences** of organisms. The most common groups are:

INVERTEBRATES	SPONGES	
	CNIDARIANS	MEDUSAS
		POLIPS
	WORMS	
	MOLLUSKS	GASTROPODS
		BIVALVES
		CEPHALPODS
	ARTHROPODS	INSECTS
		ARACHNIDS
		CRUSTACEANS
	MIRIAPODS	
ECHINODERMS		

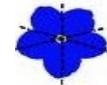
There are several types of symmetry:

a) **Bilateral**. It is the most frequent. You can divide the body into two halves (mitades).



Zygodontia

b) **Radial**. The body can be divided into more than two halves.



Actinostroma

c) **Irregular**. The body can not divide in any parts. Amorphous.

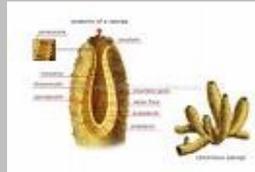
Activity 1. Indicate which of the following objects have **bilateral**, **radial** or **irregular** symmetry.

INVERTEBRATES

SPONGES

- They are **aquatic**.
- They look like plants but they are animals.
- Sponges **stay fixed** (immobile) in one place.
- Their bodies are **full of holes** and their skeleton is made of spiky fibers.
- Water flows through the holes of their body which enables them to catch food.
- Have **irregular symmetry**.



CNIDARIANS

-They have two basic body forms: **Swimming medusae**.

Sessile polyps

-Have **radial symmetry** with mouths surrounded by tentacles.

-Have a **single orifice** and body cavity that are used for digestion and respiration.

-They feed by catching tiny animals in their tentacles.

-They are **aquatic**.

More.....

MEDUSAS

-They **move from place to place**.

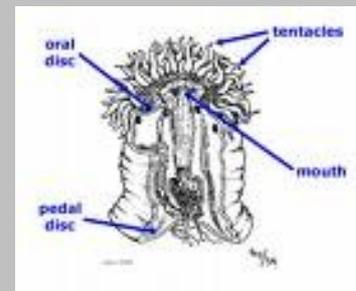
Example: **Jellyfish**, etc..



POLYPS

-They look like plants but belong to the animal kingdom. They **stay fixed** in one place.

Examples: **Corals, sea anemone, hydras**, etc..



WORMS

- They have a **long, soft body** and **no legs**.

- They can be found in both land and water environments. Many of them are parasites and several others may be free-living or nonparasitic.

- Have **bilateral symmetry**.

-Some worms reproduce sexually (hermaphrodites) and asexually



NEMATODES OR ROUNDWORMS

-They have **rounded bodies**.

-They are **unsegmented** with a **complete digestive system**.

-They have no circulatory or respiratory systems.

Example: **Trichinella** that causes trichinosis.



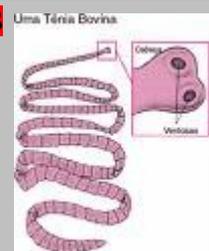
PLATYHELMINTHES OR FLATWORMS

-They have **flattened bodies**.

-They have an **incomplete digestive system**. It has one opening.

-They have no circulatory or respiratory systems

Example: **Tapeworm (tenia)** (intestinal parasite)



ANNELIDS

-They have **rounded** bodies and they are divided in **segments** with a **complete digestive system** and closed circulatory system.

Example: **Earthworm** (lombriz de tierra), **leech** (sanguijuela), etc...



ECHINODERMS

They have **radial symmetry** (five parts).

They are **marine**.

Their body are covered with spines.

They have tiny tube feet and body parts arranged around central mouth.

Examples: **Starfish (estrella de mar), sea urchin (erizo de mar) , sea cucumber (pepino de mar) etc...**



More.....

2. SPONGES. CNIDARIANS. WORMS. ECHINODERMS.

- They are the **most simple and primitive**.

- **They often lack** (carecen) **many organs and skeleton**.

- They have no **digestive system** or it consists of many single bag which makes digestion and a single hole that serves as a mouth and anus.

They **have no respiratory system**. They have **cutaneous respiration**.

The oxygen goes directly to the cells, this requires that the skin is moist and the animal is small.

- They have reproduction:

a) Sexual. With two parents (**male and female**).

A parent with a male and a female part (**hermaphrodite**)

b) Asexual. Reproduction without sex (eg., dividing into several pieces). They have a **great capacity to regeneration**. If an animal is divided into several parts, each part will result in a new individual. Example: when a star loses an arm it will create another arm, and the lost arm will result in a new star.



SYSTEM	DIGESTIVE	RESPIRATORY	CIRCULATORY	REPRODUCTOR
SPONGES	NO	NO	NO	NO
CNIDARIANS	Rudimentary	NO	NO	Rudimentary
WORMS	Some of them yes and other no	NO	Some of them yes and other no	Rudimentary
ECHINODERS	Rudimentary	NO	NO	Rudimentary

Activity 2. What food do sponges eat?.

How do they eat ?

Activity 3. What food do cnidarians eat?

How do they catch their prey?

Activity 4. The jellyfish and polyps belong to the group of cnidarians and have many things in common. What is the main difference between jellyfish and polyps?

Activity 5. Tapeworms and roundworms are parasitic worms that live inside the intestines of vertebrates. They do not have any digestive system. How do they eat?

Activity 6. If a body part swells (hinchados) excessively due to an illness it can cause problems (amputation and even death), so it is necessary to decrease swelling. Today this is done by medicine (anti-inflammatory) before a parasitic worm was used to lower inflammation. What is this worm?

Activity 7. Starfish have a great capacity for regeneration. What happens to a starfish when an arm is cut off?

Activity 8. Would an earthworm die if its body were divided in two pieces?

What would happen?.

Activity 9. What would happen to a worm if its skin dried out?.

Why?.

Activity10. Why are most of the sponges, cnidarians, worms, and echinoderms aquatic or they live in moist areas?.

Activity 11. Fill the following table:

ANIMAL	GROUP	ANIMAL	GROUP
Earthworm	WORMS	Tapeworm (Tenia)	
Sponges		Sea urchin (Erizo de mar)	
Starfish		Intestinal worm	
Leech		Coral	
Jellyfish		Sea anemone	

Activity 12. Why do many people often confuse the polyps and sponges with plants, while the jellyfish, which belong to the same group, are identified as animals?.

Activity13. Indicate the symmetry of the following animals:

ANIMAL	SYMMETRY	ANIMAL	SIMMETRY
Sponge		Earthworm	
Jellyfish		Leech (Sanguijuela)	
Anemone		Tapeworm (Tenia)	
Hydra		Seafish	
Coral		Sea urchin (Erizo de mar)	

3. MOLLUSC

- They are **more complex** animals than previous ones.

- Most of them **have got digestive, respiratory, circulatory and reproductive systems**. They have lost capacity of regeneration. If an animal is divided in two halves it does not survive. They have sexual reproduction, many of them are hermaphrodites.

- All of them need to live in moist (húmedos) places, because they have bare skin (desnuda) and it can dry easily.

INVERTEBRATES	
<h3 style="color: white;">MOLLUSKS</h3> <p>-They have soft body in three continuous parts with head, body mass and foot.</p> <p>- They may have one or two shells.</p> <p>- They are aquatic or tend to live in damp places.</p> 	<h4 style="text-align: center;">GASTROPODS (Gasterópodos)</h4> <p>-They have a single shell , head and they move on a flattened and muscular food.</p> <p>-Some are aquatic and others are land creatures, but they tend to live in damp places</p> <p>- They are usually herbivores.</p> <p>Examples: Snail (caracol), slug (babosa), limpet (lapa), etc..</p> 
	<h4 style="text-align: center;">BIVALVES</h4> <p>- They are aquatic.</p> <p>- Their body is enclosed between two shells hinged together by a ligament.</p> <p>- They have got no head.</p> <p>-They feed by siphoning and filtering large particles from water.</p> <p>Examples: Clam (almeja), oyster (ostra), mussel (mejillón), scallop (vieira),etc...</p> 
	<h4 style="text-align: center;">CEPHALPODS</h4> <p>- They are aquatic.</p> <p>- Shells are rudimentary or absent in most of them.</p> <p>- They have the mouth and head surrounded by tentacles. They are the most intelligent of all invertebrates.</p> <p>-They are carnivores. They are excellent swimmer.</p> <p>Examples: Octopus (pulpo), squid (calamar), cuttlefish (sepia), etc...</p> <p>More...</p> 

Activity 14. Mollusks are divided into three groups. Fill in the following table:

ANIMAL	GROUP	ANIMAL	GROUP
Snail (Caracol)	GASTROPOD	Cuttlefish (Sepia)	
Octopus (Pulpo)		Clam (Almeja)	
Slug (Babosa)		Squid (Calamar)	
Mussel (Mejillón)		Limpet (Lapa)	

Activity 15. Which subgroup of mollusks has no head?.

Examples: Clam, _____, _____ and _____

Activity 16. Fill in the following table:

MOLLUSKS	FEEDING	N° SHELLS	KIND OF MOVEMENT	EXAMPLES (Al menos 3)
GASTROPODS				
BIVALVES				
CEPHALPODS				

Activity 17. Which subgroup of molluscs is equipped with powerful tentacles, has great mobility and great intelligence ?.

Actividad 18. Octopus, and cephalopods in general, have a great intelligence and great flexibility. They have been tested with intelligence tests and they have passed easily . Scientists put an octopus in a pool with a crab inside a glass jar. What did the octopus do?. Choose the correct answer:

- It surrounded the bottle, touching it for hours, and then the octopus abandoned him.
- He took the bottle, looked at it, unscrewed the top with a tentacle, and entered inside eating the crab.
- It looked at the bottle and realized that the crab was inaccessible , so it was clever to not waste energy trying opening it.

Activity 19. Cephalopods have the ability to change color, it can serve to:

Choose the correct answer:

- It displays their mood to other cephalopods (I ' m angry, hungry, quiet, in heat, scared, etc..).
- To serve as camouflage from their prey or predators so that they can not see them.
- To communicate with other cephalopods.
- All are correct.

Actividad 20. Octopus can shoot jets of ink. Choose the correct answer:

- They throw ink on their enemies to poison them and escape.
- They throw ink on their enemies to stain (manchar) the water and escape.
- They throw ink because they like the black water to pretend it is night.
- They throw ink to have better digestion.

4. ARTRHOPODS.

- They are the **most complex** invertebrates.

- All of them **have got digestive, respiratory, circulatory and reproductive systems**. They have lost the capacity of regeneration. If an animal is divided in two halves it does not survive. If they lose a leg, they cannot create a new one. They have sexual reproduction, most of them are single males or females. Only a few are hermaphrodites.

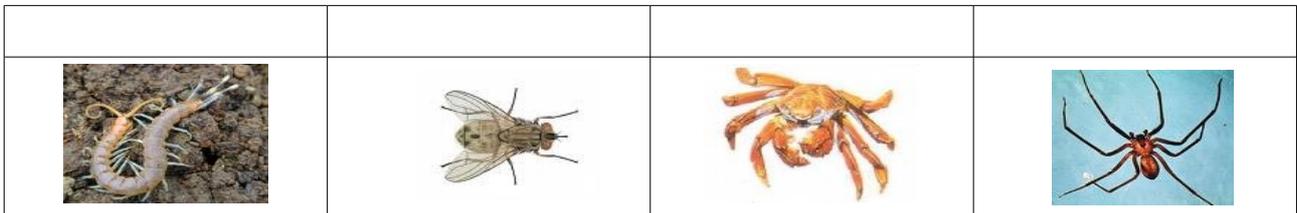
- There are many types, some of them can live in water, others in damp places and others may live in very dry places.

- They have an **exoskeleton** (external skeleton) that protects their bodies and allows them to run out of water without deforming their bodies. The only drawback is the necessity to change it when the animal has to grow, leaving him temporarily unprotected while growing a new one.

- The arthropods are classified by the number of feet, into four subgroups:

GROUP	N° LEGS	N° PART OF THE BODY
INSECTS	6	3
ARACHNIDS	8	2
CRUSTACEANS	10	2
MIRIÁPODS	More than 10	A lot

Activity 21. Indicates the group they belong to the following arthropods (look at number of legs).



Activity 22. Why is the body of an octopus or a jellyfish deformed when they are taken out of water?

Why is the body of a crab not deformed when it is taken out of the water?

Activity 23. Why do the exoskeleton of crabs, insects and spiders change frequently?

What would happen to them if they did not do this?.

What would happen to them if at the same time of moulting (muda) a predator attacked them?.

Why ?.

Activity 24. ¿ Which is the only group of invertebrates that can live on land, even in dry climates?.

Why?.

INVERTEBRATES

INSECTS

- They have **three pair of legs**.
- Their bodies are divided into **three segments**: head, thorax and abdomen.
- Most of them have **wings** and can fly.
- They may be carnivorous, herbivorous or omnivorous
- Many insects are born from eggs as larvae and have to pass through further mayor physical changes (**metamorphosis**) before reaching adulthood.

Examples: **Ant (hormiga)**, **fly (mosca)**, **bee (abeja)**, **butterfly (mariposa)**, etc..



More...

ARTHROPODS

- They have **jointed legs**.



- They have **hard exoskeleton**.

-The rigid exoskeleton inhibits growth, so arthropods replace it periodically by **molting**.

- They have **segmented bodies**.

- Have **bilateral symmetry**.



ARACHNIDS

- They have **four pair of legs**.
- Their bodies are divided into **two segments**: cephalothorax and abdomen.
- They are mostly carnivorous and several groups are largely venomous.

Examples: **Spider (araña)**, **scorpion**, **tick (garrapata)**, **mite (ácaro)**, etc....



CRUSTACEANS

- They have **five pair of legs**
- Their bodies are divided into **two segments**: cephalothorax and abdomen.
- They are usually **aquatic**.
- They are usually carnivorous o filterers.

Examples: **Crab (cangrejo)**, **lobster (langosta)**, **shrimp (gamba)**, **krill**, etc



MIRIPODS

- They have **more than five pair of legs**.
- Their bodies are divided into **several segments**.
- They are usually **terrestrial**.
- They are mostly **herbivorous** with the exception of centipedes which are **carnivorous**.

-Examples: **Millipede (milpiés)**, **centipede (ciempiés)**, etc..



Activity 25. Ticks (8 legs) and lice (6 legs) have very similar lifestyles. Both are arthropods and both are parasites that live by sucking the blood of their victims. They are a similar size and shape. Do they belong to the same group of arthropods?

Why or why not?

Activity 26. Which is the group of arthropods that the majority of its members are aquatic?.

Activity 27. Which is the group of arthropods that the majority of its members have got wings and can fly?

Activity 28. Fill in the following table:

ANIMAL(SP)	ANIMAL(UK)	GROUP	ANIMAL(SP)	ANIMAL(UK)	GROUP
Araña	Spider	ARACHNID	Saltamontes		
Mosca			Cigala		
Ciempiés			Cucaracha		
Cangrejo			Ácaro		
Garrapata			Avispa		
Escorpión			Hormiga		
Mariposa			Centollo		
Abeja			Gamba		

Activity 29. Fill in the following table of arthropods:

ANIMAL SP	ANIMAL UK	GROUP	N° LEGS	N° DE PARTS OF THE BODY	FEEDING	HÁBITAT
Araña		Arachnids	8	2	Carnívoros	Terrestres
Hormiga						
Cucarachas						
Ciempiés						
Milpiés						
Cangrejo						
Escorpión						
Cigala						
Saltamontes						
Mosca						
Garrapata						
Piojo						

Activity 30. Many insects are born from their eggs as larva or as a caterpillar (oruga) to later become the adult insect. What's the process?.

Actividad 31. The larvae or caterpillars of the insects are commonly called "worms" for the common people. Millipedes are confused with worms by many people. Would you know how to say what is the difference between a real worm and a caterpillar (oruga) or a millipede? . Look at the pictures:



Actividad 32. Match A to B

A	B
Insects	Body divided into cephalothorax and abdomen.
Arachnids	Body divided into many segments.
Crustaceans	Body divided into cephalothorax and abdomen.
Miriapods	Body divided into head, thorax and abdomen.

Actividad 33. Fill in the following table of invertebrates indicating the groups they belong to .

ANIMAL SP	ANIMAL UK	GROUP	ANIMAL SP	ANIMAL UK	GROUP
Hormiga		Arthropod (insect)	Mejillón		
Garrapata			Milpiés		
Medusa			Escorpión		
Lombriz de tierra			Mariposa		
Caracol			Coral		
Cangrejo			Tenia		
Ciempiés			Estrella de mar		
Araña			Saltamontes		
Esponja			Sepia		
Anémona			Lapa		
Pulpo			Erizo de mar		
Babosa			Vieira		
Sanguijuela			Centollo		

5. CLASSIFICATION OF LIVING BEINGS. (Widening)

Scientists believe that there are over 10 million different kinds of life forms, or species on Earth. Imagine trying to study and understand the lives, patterns, behaviors, and evolution of so many different kinds of organisms. In order to make their job easier, scientists classify living things into groups and smaller subgroups, based on how they are the same, and how they are different.

A species is a set of beings which are physically similar and which reproduce among themselves and produce fertile descendants.

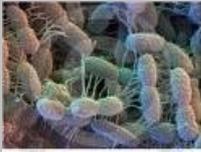
The highest category of classification is the kingdom. There are five kingdoms.

http://www.educared.net/aprende/anavegar5/Podium/images/A/2564/los_seres_vivos.htm

http://www.bbc.co.uk/schools/ks3bitesize/science/biology/classification_intro.shtml

http://www.kidsbiology.com/biology_basics/index.php

KINDOMS OF LIVING BEINGS

KINGDOM	MONERA	PROTISTS	FUNGI	PLANTS	ANIMALS
Number of cells	Unicellular	Unicellular Multicellular	Unicellular Multicellular	Multicellular	Multicellular
Type of cells	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Nutrition	Autotroph Heterotroph	Autotroph Heterotroph	Heterotroph	Autotroph	Heterotroph
Organisms	Bacteria, cyanobacteria	Algae, protozoa (amoeba, paramecium)	Mushrooms, yeasts,moulds	Mosses, ferns, flowering plants and non- flowering plants	Sponges, worms, insects, fish, amphibians, reptiles, birds, and mammals
					
					

<http://www.kidport.com/RefLib/Science/animals/animals.htm>

