

Arthropods

Name _____

Date _____

Block _____

Arthropods

An arthropod is an invertebrate with an _____, a _____ body, and _____ legs

There are four main kinds of arthropods:

- 1.
- 2.
- 3.
- 4.

Some arthropods – such as insects, centipedes, and millipedes are thought to have evolved from _____. Other arthropods, such as _____ (which are extinct), are thought to have evolved from ancient and distantly related ancestors.

There are more than 1 million kinds of arthropods on earth.

There are three characteristics that all arthropods have:

- 1.
- 2.
- 3.

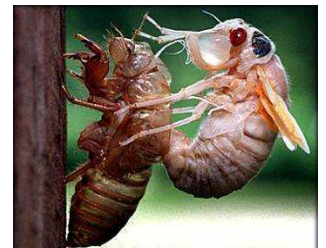
All Arthropods have an exoskeleton

An exoskeleton is a hard, outer coating

- Made of _____
- May be _____ or very hard
- Usually _____ in terrestrial arthropods
- Serves as protection
- Cannot _____ as the arthropod grows

Some arthropods grow too big for their exoskeletons – these arthropods will molt.

_____ is to leave an exoskeleton and grow a new one.



Arthropods:

- Have segmented bodies
- Have jointed legs
- Have a _____ to pump blood through their bodies
- Reproduce _____

Segmented Bodies

- Some arthropods have _____ on every segment
- Other arthropods have lost segments as they have _____; some appendages are lost as a result.

Jointed Appendages

-
-
-
-
-
- Etc.

They also have...

- A _____ (in dorsal portion of head)
- A ventral nerve cord
- An _____ Circulatory system

Internal Transport:

- They have an open circulatory system – the heart contracts; blood is pumped through arteries to vessels, and then enters _____ in the tissue.

Respiration:

- The three basic respiratory structures found in arthropods are:
 - _____: movement of mouthparts and appendages keep water moving over gills; most look like a row of feathers under the exoskeleton
 - _____ and _____: Layered sheets of tissue increases surface area (SA) for gas exchange; in spiders, spiracles connect book lungs with outside air
 - _____: lead from spiracles into tissues of the arthropod; movements of body cause tracheal tubes to expand and contract, moving air in and out through the spiracles.

Response:

-Arthropods have a well-developed nervous system:

- Brain with a pair of _____ -
- Pair of nerves connect brain to _____.
- Ganglia along the length of the ventral nerve cord (coordinate movement of _____ and _____)
- _____ (involved in balance)
- Chemical receptors
 - _____ and insects have a well-developed sense of taste
 - _____ are found in mouthparts, antennae and legs
- Most arthropods have _____ (which detect color and motion very well)
- Crustaceans and insects have _____ that detect movement (of water or air)
- Most insects have well developed ears/hearing (oval tympanum)

Excretion:

■ ***Terrestrial arthropods:***

- _____ remove nitrogenous wastes from blood, concentrates the wastes, and adds them to solid wastes prior to elimination (through the anus); some also have excretory glands at the bases of legs

■ ***Aquatic arthropods:***

- Metabolic wastes diffuse out of the body at the _____-; some have a gland called a _____ - gland (in the head) that empties metabolic wastes out of the body

Reproduction:

- Arthropods reproduce _____
- _____ fertilization (within the female)
 - Spiders and some crustaceans: male deposits a sperm packet that the female picks up
 - Most insects and crustaceans: males deposit sperm inside the female via a specialized reproductive organ

Movement:

- Muscle systems coordinated by the nervous system
- Muscles allow the movement of appendages by generating a force against the exoskeleton

Four kinds of arthropods

■ Crustaceans

-
-
-
-



■ Chelicerates

-
-
-
-



■ Uniramians

-
-
-



■ Trilobites

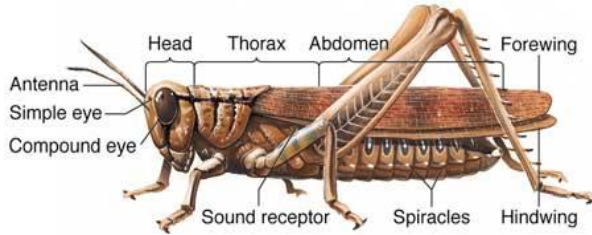
- Now Extinct



Major Groups of Arthropods

- Subphylum _____ – all forms believed to be extinct
 - could be some of the earliest arthropods
- Subphylum _____ – First pair of appendages form 'Chelicera' or pincher-like structures used for feeding.
 - 4 pairs of walking legs, no _____.
 - The 'Arachnida' is the only important parasitic group.
- Subphylum _____ = mostly aquatic, most have gills, _____ pair of _____.
 - Biramous appendages, meaning limbs have more than one branch. Also have _____.
 - Some are parasitic, but we will not cover them.

- Subphylum _____ – single branch or ‘Uriramous’ appendages, mandibles, one pair of antennae.



- _____ – Millipedes – two pairs of legs per body segment



- _____ – Centipedes – one pair of legs per body segment



- _____ – 3 pairs of legs on adults,
- many with wings.
 - Most important group.



Crustaceans

- A crustacean is an arthropod that has a hard Exoskeleton, two pairs of antennae, and a mouth for crunching and grinding.

Crustaceans are:

-
-
-
-



- Crustaceans can re-grow certain parts of their body.
 - Eg. A stonecrab can re-grow its claws.

- Most crustaceans live in water and get oxygen from the water through _____.
- Gills are special respiratory organs that help some animals breathe and get _____ from the water.
- Crustaceans live in a wide range of habitats, from marine, to fresh water, and even terrestrial – they were the first animals to colonize land.

Centipedes and Millipedes

- Centipedes and millipedes are arthropods that have many _____.
- Centipedes have **one** pair of legs in each segment.
- Are _____ and eat other animals
- To capture its prey, a centipede puts poison into the prey's body with its claws
- Centipedes are found in _____ places like under rocks and in the soil.



Millipedes

- Have **two** pairs of legs on each segment
- Eat _____ and are shy animals
- When scared, it rolls up into a tiny ball to protect itself
- Do not have _____
- Are found in wet places like under rocks and in the soil.



Spiders, scorpions, ticks and mites

- All have _____ legs
- Have a body divided into _____ parts:
 - A head and chest part
 - A stomach part



Spiders

- Spiders usually eat _____, but some spiders eat small vertebrates like hummingbirds.
- Many spiders make webs out of _____
- Silk is a thin, strong, thread made in the stomachs of spiders.



- Spiders catch their prey in many different ways:
 - Some catch their prey in webs
 - Some hide from their prey, and then jump out to catch it.
- When spiders catch their prey, they bite it and poison it.
- Spiders breathe oxygen with _____.

Scorpions:

- Usually live in _____ areas
- Most are _____
 - Nocturnal means to be active during the _____
- During the day, scorpions hide under logs, rocks, or in holes in the ground
- When scorpions capture prey, they hold it with their large claws and sting it with their tails.



Ticks and Mites

- Live on other _____.
- Some ticks and mites suck juices from the stems and leaves of plants
- Other ticks and mites are very tiny and live on bugs.



Ticks and mites are harmful:

- Many ticks suck the _____ from larger animals
- Ticks can spread _____.

Insects:



- There are more kinds of insects than there are all other animal species all together.
- There could be _____ times as many insects as humans on earth.
- Insects have a body that is divided into _____ parts:
 - An insects body is divided into a:
 -
 -
 - .

Insect structure:

- Insects have _____ legs connected to the _____ part.
- Some insects' legs are all the same size. Some insects have one pair of legs larger than the other two pairs.
- A grasshopper has one pair of legs larger than the other 2 pairs. These larger legs are used for _____.



Longer back legs

Insect Growth and Development:

- Insects eat a lot, so they grow very _____. As they grow, insects may molt and grow new _____, or they may change completely.
- A huge change in appearance is called _____.
- There are two kinds of metamorphosis:
 - Complete and
 - Incomplete.



Complete Metamorphosis:

- In Complete Metamorphosis, insects like butterflies and moths have four stages of development.
 - The first stage makes an _____.
 - During the second stage, the egg hatches and a _____ comes out.
 - A caterpillar is the larva of an insect that will become a _____.
 - During the third stage, a _____ is made.
 - A pupa is sometimes wrapped in a cocoon or in a _____.
 - A cocoon is the pupa of a _____.
 - A cocoon is made of _____.
 - A chrysalis is the pupa of a _____.
 - In the last stage, the insect is finally an _____.

Incomplete Metamorphosis:

- Incomplete metamorphosis happens in grasshoppers, termites and dragonflies.
- In Incomplete metamorphosis, young animals that look like the _____ hatch from _____.
- As the young animals grow, they keep molting, shedding their exoskeletons, and getting larger.



Metamorphosis Comparison:

Metamorphosis

Simple or gradual

-Three Changes

-

-

- 3 – 5 _____ (stages between molts)

-

- Adults and nymphs eat the same food.

Insect Behaviour

- An amazing example of a colony is a _____.
- A beehive is a very organized colony of bees.



Insects' Defense:

- All insects must protect themselves
- Bees and wasps have stingers to protect themselves
- Many other insects use _____
 - Camouflage allows an insect to hide by blending in with their environment.

