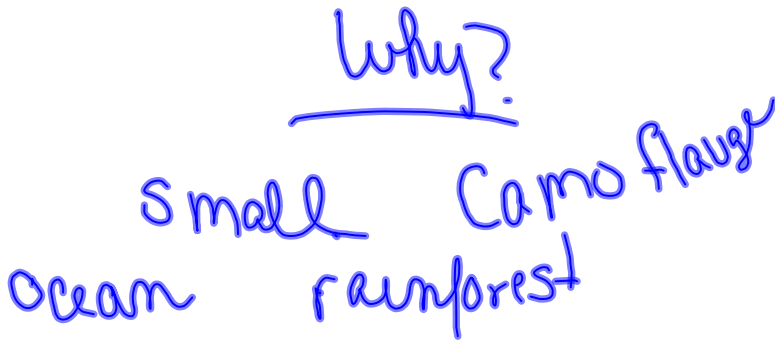
Arthropoda

Most diverse Phylum

The total number of arthropod species exceeds the number of other animal phylum combined

900,000 have been recorded

Probably the same number are not found yet



There are more beetle species that there are of all vertebrates

Arthropods means "jointed" "foot"

Like annelids have a coelom and segmentation

Appendages- structures that extend from the arthropod's body wall

Have joints and bend

Legs for walking

Antennae for sensing environment

Mouthparts

Majority are small

Size range from 80 micrometers to 3.6 meters

http://www.afsc.noaa.gov/race/media/photo_gallery/invert_files/Red_king_crab.htm

http://biology.arizona.edu/sciconn/lessons2/Geiger/Picpages/parasitic_mites_and_blue_mold.htm

Arthropods are divided into two groups

Subphylum Uriramia- with jaws

Subphylum Chelicerata or Subphylum Crustacea with fangs and pinchers

Characteristics of Arthropods

Jointed Appendages

Segmentation

Distinct head, often with compound eyes

Exoskeleton

Tracheae and spiracles

Open circulatory system

Malpighian tubules

wings

Segmentation

Sometimes only exists during the larval stage

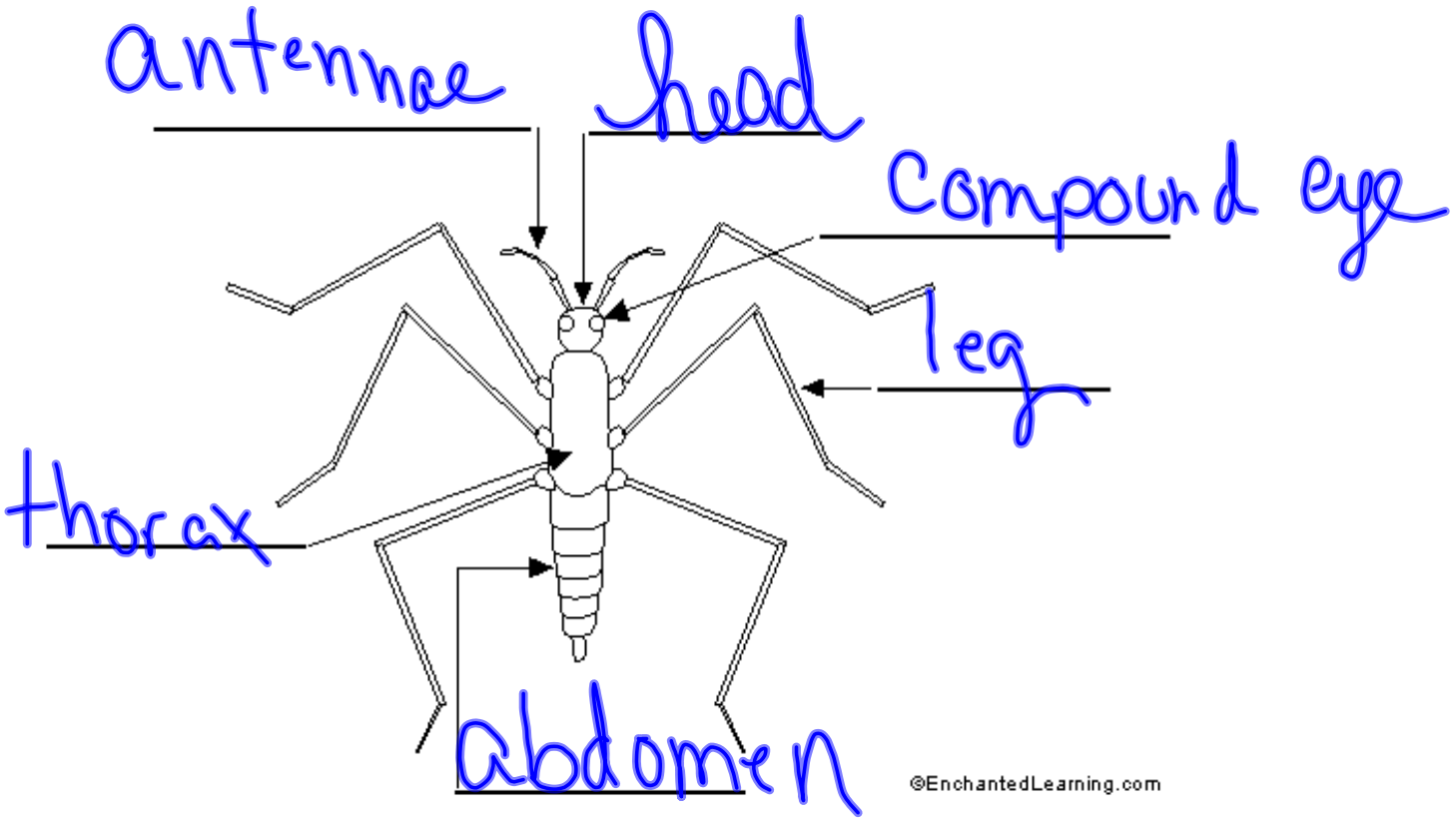
Example caterpillar vs butterfly

http://www.foagm.org/Album_02-07/caterpillar%20(ID_).jpg

Adults have three distinct regions

Head Thorax Abdomen

Some have a cephalothorax- head and thorax fused


antennae
head
compound eye
leg
thorax
abdomen
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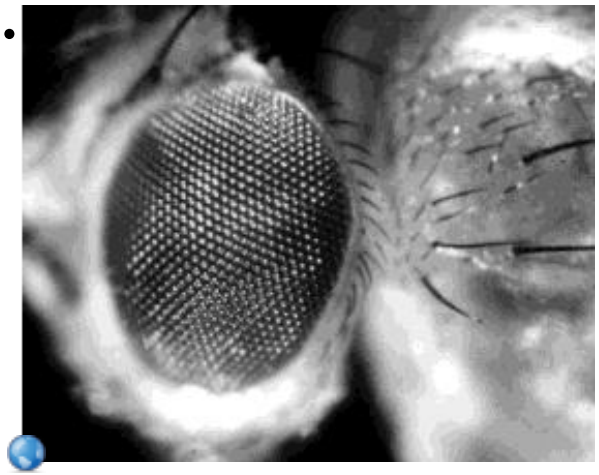
Compound eye- an eye made of thousands of individual visual units each with its own lens and retina. The brain received images from each and pieces them together.



http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/CompoundEye.html

Image is fuzzy but motion is seen quicker.
Why is this important?

Some have single eyes, some have compound eyes, and some have both

Exoskeleton

The shell is thinner and flexible where the joints are

Exoskeleton protects an arthropods from predator and helps prevent water loss

The skeleton can not grow larger so they need to shed and discard their exoskeleton (molting)

Triggered by a release of hormones.

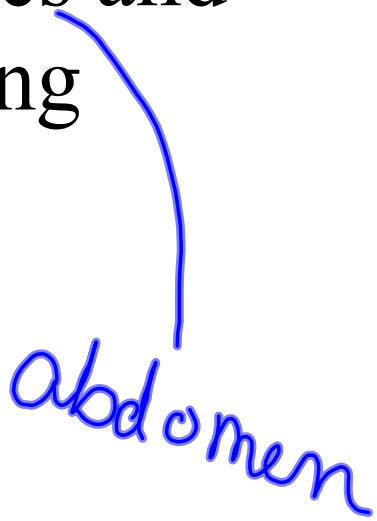
The new skeleton is beneath and still soft.

The new skeleton then hardens.

Respiration

Tracheae- a network of fine tubes

Air enters through the spiracles (hole) and passes into the tracheae delivering oxygen to the body



Excretion

Malpighian tubules- slender fingerlike extensions from the arthropod's gut that are bathed by the blood that surrounds them

Subphylum Uniramia

Mostly terrestrial arthropods with chewing mouth parts

3 classes

Insecta (insects)

Diplopoda (millipedes)

Chilopoda (centipedes)

Insect Body Plan

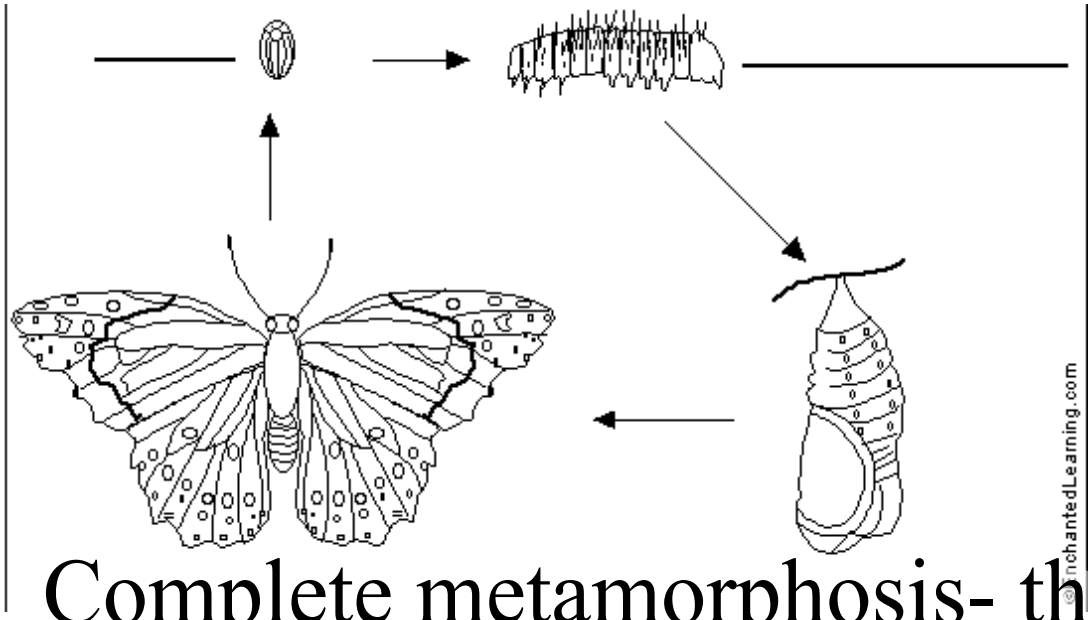
Head: has the specialized mouthparts,
one pair of antennae, compound eye

Thorax: three fused segments usually with
3 pairs of jointed legs and
wings

Abdomen: 9-11 segments

Metamorphosis: dramatic physical change

Incomplete metamorphosis-
Egg hatches into a juvenile (nymph) a small wingless adult



Complete metamorphosis- the wingless wormlike larvae encloses itself in a protective capsule (chrysalis) passes through a pupa stage and changes to an adult

Flight

An insect's wing develop from saclike outgrowths of the body wall of the thorax.

The veins in the wings carry air not blood.

In most insects only 1 pair of wings are used for flight.

Social Insects

Order Hymenoptera and Order Isoptera have evolved elaborate Social systems

There are marked division of labor with specific functions

Caste- role of an individual in a colony.

Many times most members of the colony are sterile.

Insect Relatives

Centipedes have 1 pair of legs per segment and can have up to 173 segments. They are also

Carnivores

Millipedes have two sets of legs per segments and can have from 11 to more than 100 segments. They are also

herbivores