**Notes about Arthropods**

The arthropods are the largest group (phylum) of animals.

**Characteristics of Arthropods:**

1. They have a complete digestive system (mouth, intestines and anus)
2. Their body occurs in segments.
3. Their body show bilateral symmetry.
4. They have an exoskeleton that is flexible and made of chitin.
5. They have jointed appendages (legs, antennae etc.)

***Jointed Appendages***

* These allow greater movement than for example, legs without joints
* They allow for muscle attachment and permit strong movements e.g. grasshoppers jumping, lobster claws

***Exoskeletons***

* These are made of a flexible material called chitin (a bit like the cartilage in the end of your nose)
* Exoskeletons can be continuous (like a spider) OR made of plates joined by hinges(e.g. a crayfish/lobster)
* Advantages:
  + Exoskeletons provide protection and supports internal tissues
  + Exoskeletons provide a place for muscle attachment
  + Exoskeletons can be reinforced with minerals such as calcium carbonate
* Disadvantages:
  + Exoskeletons can be very heavy (the larger the animal, the larger and heavier the skeleton has to be)
  + Exoskeletons can’t grow, so they must be shed (called molting) and replaced with a larger exoskeleton.
  + Dangerous for the animal when molting, because it really can’t move or defend itself.
* When arthropods molt, they tighten up their muscles, suck in air (or water), push really hard and crack open their old exoskeleton. They have already grown a new exoskeleton under the old, but the new one is soft and very flexible. The animal pulls its body out of the old skeleton, puffs up its body to enlarge the new skeleton, and then the new skeleton hardens to a larger size, to allow some growing room.

***Segmentation***

* Arthropods have a body arranged into 3 general segments: 1) a head, 2) a thorax (like the trunk of the body) where the legs attach and 3) an abdomen ….think about the body of an ant
* Many arthropods have a fused (joined) head and thorax called a cephalothorax…a good example are spiders.

***Respiration***

Arthropods need to be able to get oxygen to their body parts and get rid of carbon dioxide. There are three different types of structures:

1. Gills (for those that live in the water) (crayfish, crabs, lobsters)
2. Simple tubes that run through the body cavity and open through the exoskeleton. These are called tracheal tubes (grasshoppers have these)
3. Simple lungs called book lungs (spiders have these)

***Antennae***

* + These are appendages found on the head of many arthropods, but not all.
  + Help to detect: movement, sound, chemicals
  + Used for communication as well (e.g. ants)

***Eyes***

* + There are two different types of eyes found in arthropods:
  + Compound eyes – these produce images, and are made of many lenses. These eyes are very good at detecting movement
  + Simple Eyes – these are made of one lens, and are good at detecting light levels
  + Arthropods usually have 1 pair of compound eyes, and then several simple eyes (3 – 8)

***Circulatory System***

* Arthropods don’t really have veins and arteries like our body. They have a heart with some short blood vessels that enter and leave the heart, but the blood basically just leaves the heart and sloshes around over the organs and muscles. This is called an open circulatory system.

***Mouth Parts***

* Arthropods have one pair of jaws called mandibles. Mandibles can look like pincers or the jaws of plyers (think of ants or horseflies), but mandibles can also be shaped like a needle for jabbing (mosquitoes), a rolled up tube (butterflies) or a flexible, extendable tube (house flies). Holding, chewing, sucking and biting

So what are we talking about when we talk about arthropods? There are many different types, obviously, so we will only look at what the classes of arthropods are;

Kingdom Animalia

Phylum Arthropoda

Class Crustacea

Includes crabs, lobsters, sowbugs

Class Chilopoda

Centipedes (these have 1 pair of legs per segment)

Carnivores (eat other animals)

Class Diplopoda

Millipedes (these have 2 pairs of legs per segment)

Eat decaying plant material

Class Arachnida

Spiders, ticks, mites, harvestman, scorpions

All have poison fangs

Class Insecta

* Largest group of arthropods, and contains the most animals on earth
* Body in three parts (head, thorax and abdomen)
* 3 pairs of legs
* Life cycle involves eggs being laid, these hatch into one of two forms: either a larvae (think of a caterpillar – it doesn’t look like the adult) OR a nymph (which looks like the adult but is much smaller)
* Some examples: flies, beetles, ants, mayflies, grasshoppers, crickets, giant water bugs, june bugs, aphids, ladybugs, cockroaches, termites, lice, earwigs, stink bugs, spittle bugs, leaf hoppers, lacewings, scarab beetles, tent caterpillars, spruce budworm, fleas, moths, butterflies, preying mantis, bees, wasps