

LIFE SCIENCES 11

ARTHROPODS

Phylum	Arthropoda
Level of Organization	Organ
Digestive System	Tube
Symmetry	Bilateral
Coelom	Coelomate
Cavity Development	Protostome
Segmentation	Yes

Arthropods

- approximately 84% of all animals are arthropods
- have exoskeletons made of chitin used for protection and muscle attachment that must be shed for growth (molting)
 - may be hard (crab) or leathery (grasshopper)
- have paired, jointed appendages
- segments are often fused into three main body regions
 - head – location of mouth, eyes and often antennae
 - thorax – middle section to which legs and wings may be attached
 - abdomen – posterior section that has additional legs and contains organs for digestion and reproduction
 - in some organisms, the head and thorax are fused into the cephalothorax
- digestion
 - use mandibles to collect food – may be adapted for biting, sucking, stabbing or feathery strainers
 - may be herbivores, carnivores, filter feeders, omnivores or parasites
 - have a complete, one-way digestive tract
- respiration
 - aquatic arthropods use gills for gas exchange
 - tracheal tubes
 - system of branching tubes attached to openings on the side of the body called spiracles
 - used by most terrestrial arthropods
 - book lungs
 - sac-like pockets with folded walls that look like the pages in a book
 - used by spiders
- circulation
 - open circulatory system
 - heart pumps blood through vessels to open areas
 - blood flows over the tissues in the open spaces

- used to transport nutrients and waste products
- excretion
 - most use Malpighian tubules located in the abdomen to remove metabolic wastes from the blood
 - empty into the gut and wastes are removed with undigested food
- reproduction
 - most have separate sexes and use internal fertilization with copulation
- 4 main subphylums
 1. Crustaceans
 - mainly aquatic – crabs, shrimp, lobster, crayfish, barnacles
 - some terrestrial – pill bugs and woodlice
 - most aquatic crustaceans have 5 sets of legs
 - first pair (chelipeds) adapted as claws
 - 4 pairs for walking
 2. Chelicerates
 - Class Arachnida
 - spiders, ticks, mites and scorpions
 - most have 2 body segments – cephalothorax and abdomen
 - first pair of appendages are modified into mouthparts called chelicerae
 - lack antenna
 3. Hexapods
 - Class Insecta and Class Entognatha (silverfish)
 - 80% of all arthropods are insects
 - have a head, thorax and abdomen
 - only group that may have wings (thin double membrane of chitin)
 - undergo metamorphosis
 - complete metamorphosis – egg → larva → pupa → adult
 - incomplete metamorphosis – egg → nymph (immature adult) → adult
 - may form large social groups that work together
 4. Myriapods
 - Class Chilopoda (centipedes)
 - one pair of legs per segment
 - carnivorous
 - Diplopoda (Millipedes)
 - one pair of legs per thorax segment and two pairs legs per abdomen segment
 - herbivores

Ant



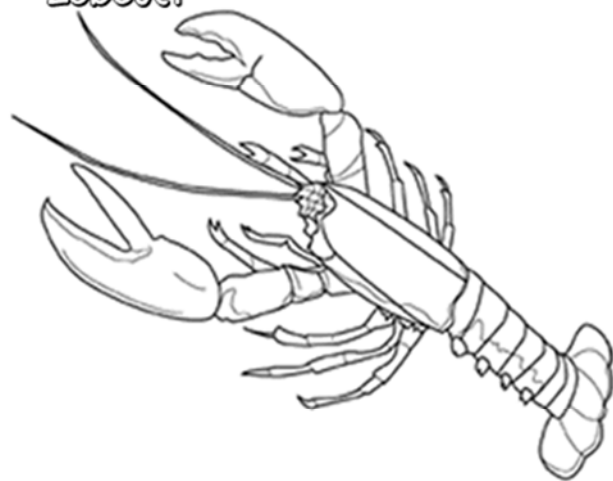
Spider



Grasshopper



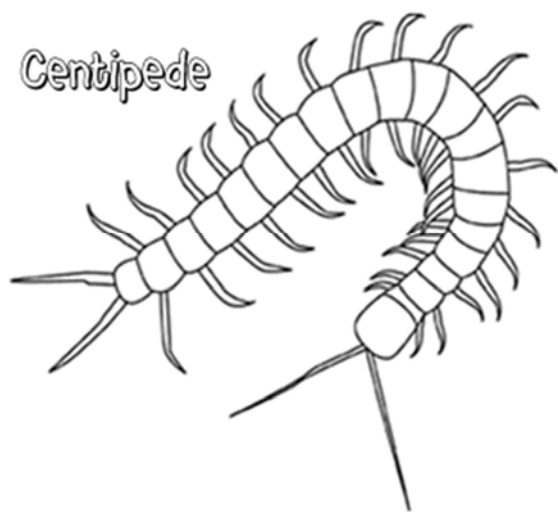
Lobster



Bee



Centipede



Tick

