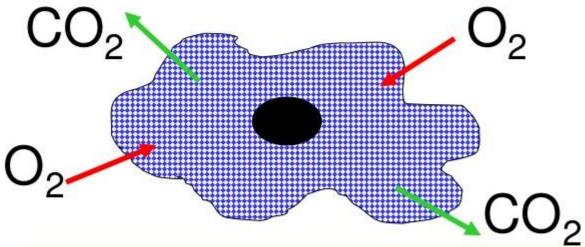
Animals excretion

•All animals eat to get energy, and their products of digestion have to be removed from body. This process is called **excretion**. All animals have special organs for excretion.

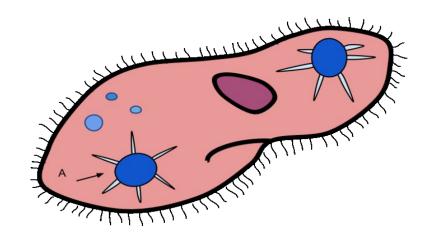
Protozoans (amoeba, paramecium)

•They have contractive vacuole to remove wastes, or diffusion is another way to remove waste(CO2) from the cell.

Respiration of Amoeba sp.

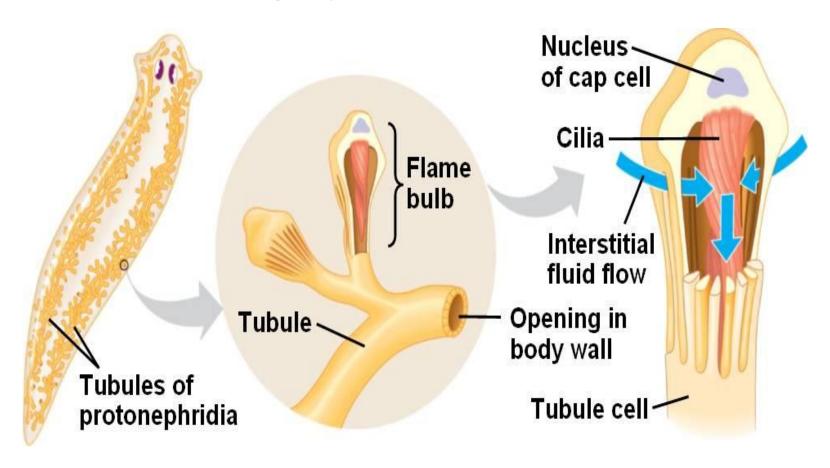


Exchange of oxygen and carbon dioxide occurs through the plasma membrane through simple diffusion.



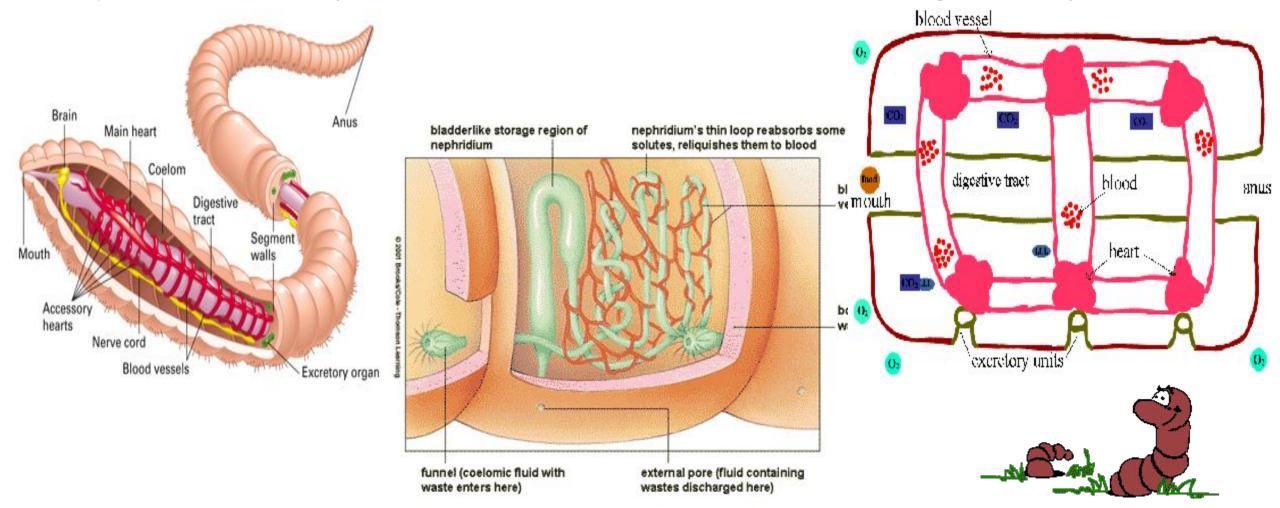
Flatworms(planaria)

•Flatworms use **flame cells** to excrete wastes. Many flame cells come together to form a *net of tubules*. Tubule collect wastes and excrete them through pores.



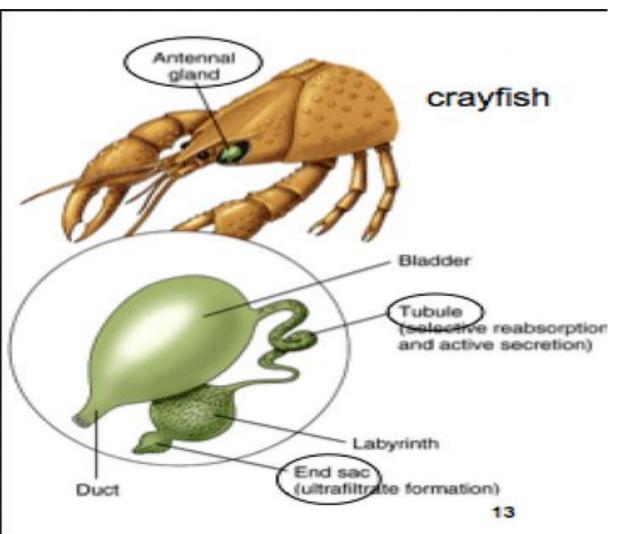
Segmented worms (earthworm)

•Segmented worms have net of ciliated tubules called nephridia. They remove wastes outside through the pores.

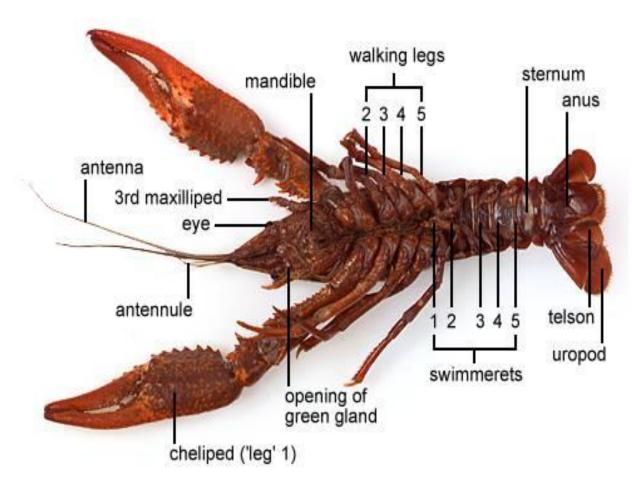


Crustaceans(crayfish, lobster)

Excretory organs of crustaceans are green glands.



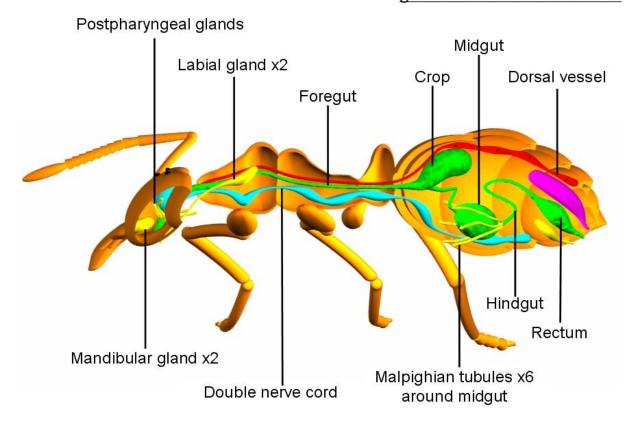
Crayfish - Ventral View (Male)

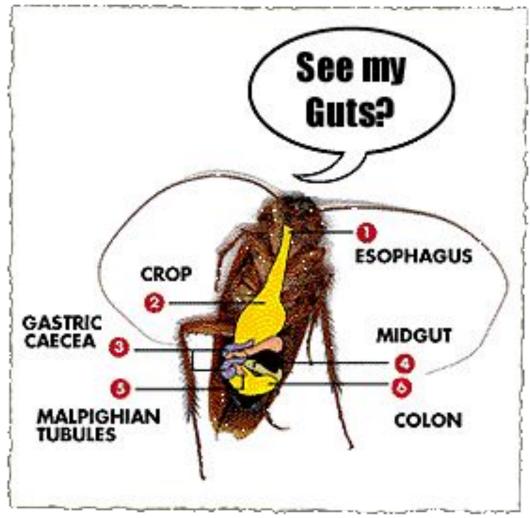


Insects(ant, bee)

Insects use Malpighian tubules

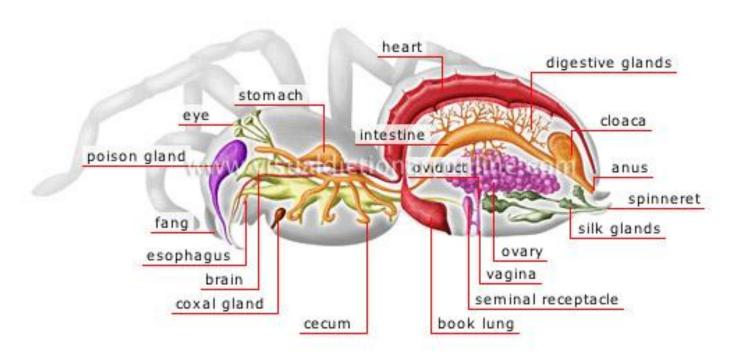
Cutaway of an ant showing some of the major glands and other structures





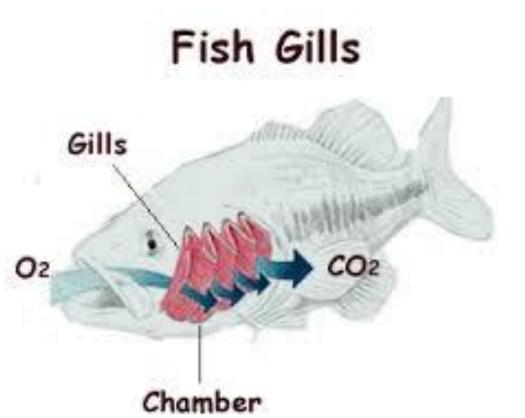
Arachnida(spider)

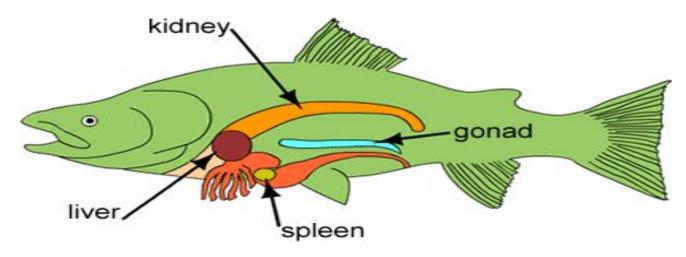
Coxal glands and Malpighian tubules



Fish

•They use gills to excrete CO2(carbon dioxide) and kidneys to remove ammonia.

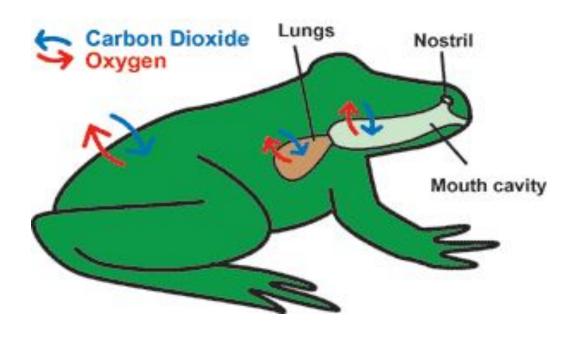


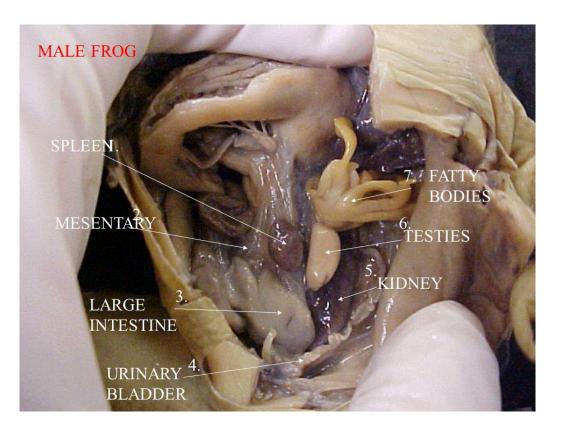




Amphibians (frog)

 Adult amphibians use lung and skin to excrete CO2, and oval kidney to remove ammonia

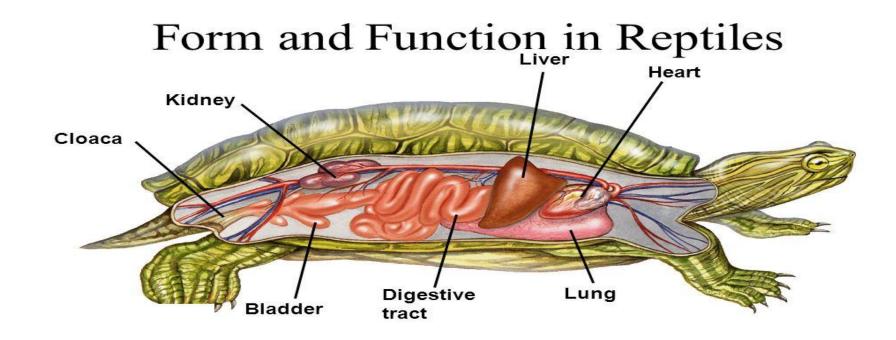






Reptiles(lizards and crocodiles) and birds

•They remove uric acid from kidney through cloaca, and lungs to remove CO2



Mammals

•They have bean shaped **kidneys** which are connected to **urinary bladder** by **ureters.** The waste products of mammals is *urine*. Some mammals also excrete salts by sweating.



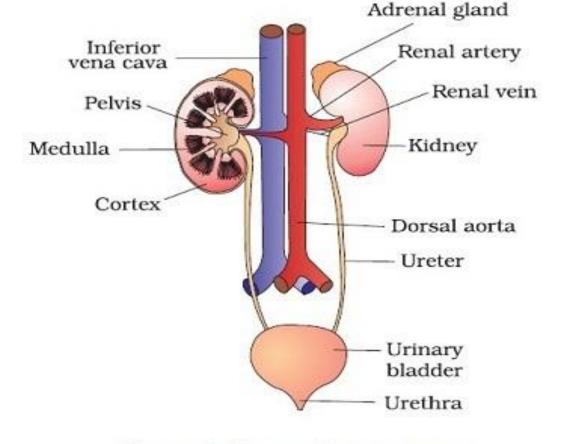


Figure 1. Human Urinary system