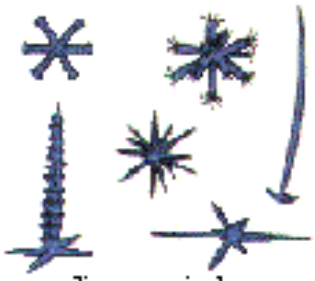
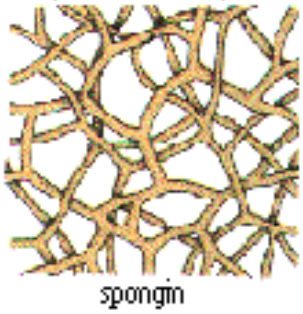
Phyla of the Animal Kingdom
Please----------porifera--sponges
Call----------cnidaria--jellyfish, hydra
Paul----------platyhelminthes, flatworms
Newman----------nematoda, roundworms
After----------annelida, segmented worms
Monday's----------mollusca, snails, octopods, squid
Absolutely----------arthropoda, insects, spiders, crustaceans
Exciting----------echinodermata, starfish, sea urchins
Class----------chordata, fish, amphibians, reptiles…

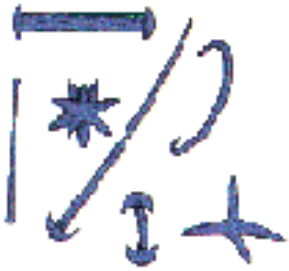
Phylum Porifera (sponges)

- Characterized by the many tiny pores that open to the outside. (porifera). Water and food enter the sponge through many small pores and exit via the osculum(or open end).
- Some show radial symmetry, most are asymmetrical.
- Some have specialized cells, but no tissues.
- No mesoderm thus no muscles. They are sessile which is a fancy way to say they can't move.
- They are heterotrophic.

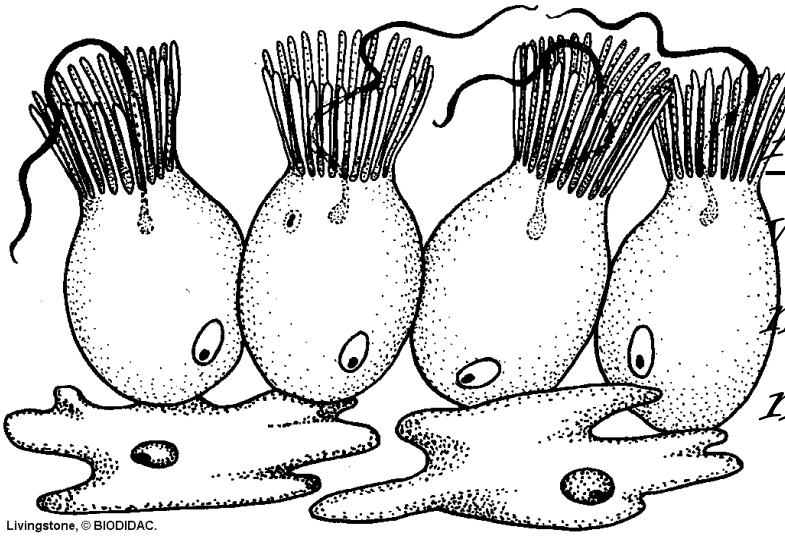
Typical sponge has 4 basic types of specialized cells organized into two layers.







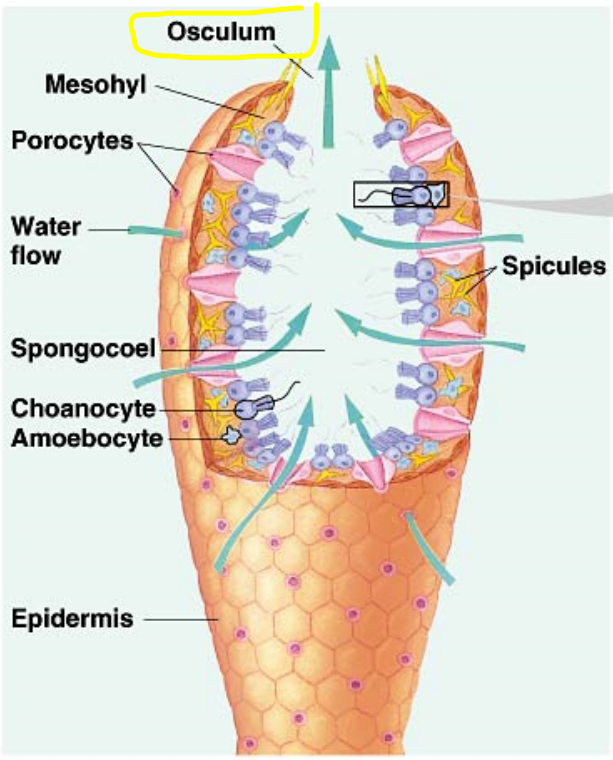
BELOW THE EPIDERMIS IS THE MESENCHYME. SPICULES ARE EMBEDDED IN IT. SPICULES PROVIDE SUPPORT AND PROTECTION.

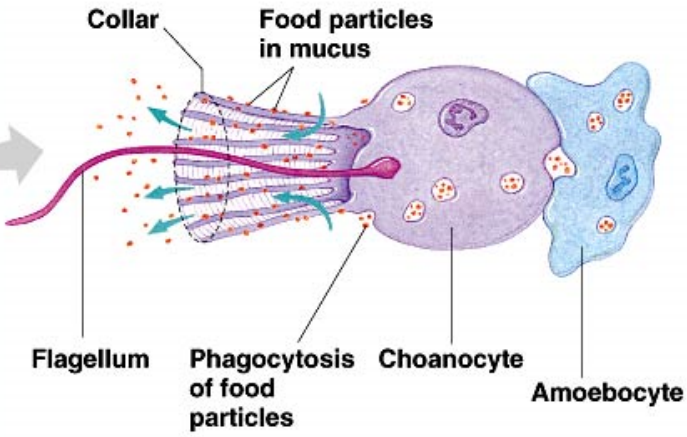


<u>Amoebocytes</u> are wandering cells. Th move through the mesenchyme.

<u>Collar cells</u> are flagellated and line the interior cavity. They provide a current to draw in water.

Also known as Choanocytes





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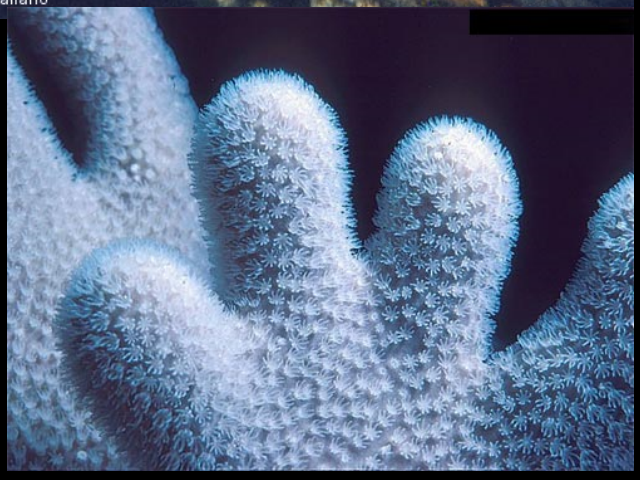
Most sponges are hermaphroditic, they have both sex cells but they are not produced at the same time. Sperm from one sponge fertilizes the egg from another sponge. The zygote develops into a free living larvae which eventually attaches to the bottom and undergoes metamorphosis and becomes a sponge. Some sponges may also reproduce asexually by budding.

(c) Herb Segars

Phylum Cnidaria

- Have true tissues and are radially symmetric.
- Only have two germ layers, ectoderm and endoderm. The middle is called mesoglea and is jelly-like.
- Examples: Hydra, jellyfish, sea anemones and coral colonies.



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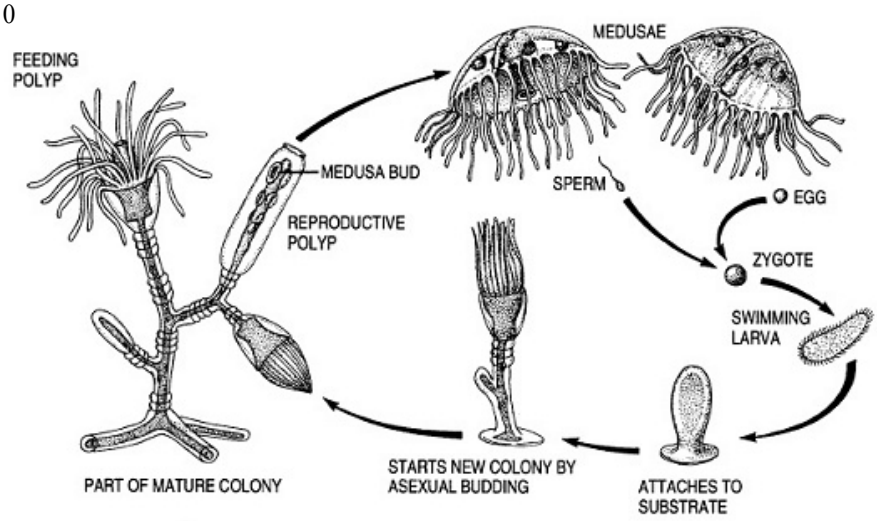


Two basic body types or life-stages. <u>Medusa</u> is a free-swimming form (ex. Jellyfish). The sessile <u>polyp</u> form has a tube-like body with a mouth surrounded by tentacles.

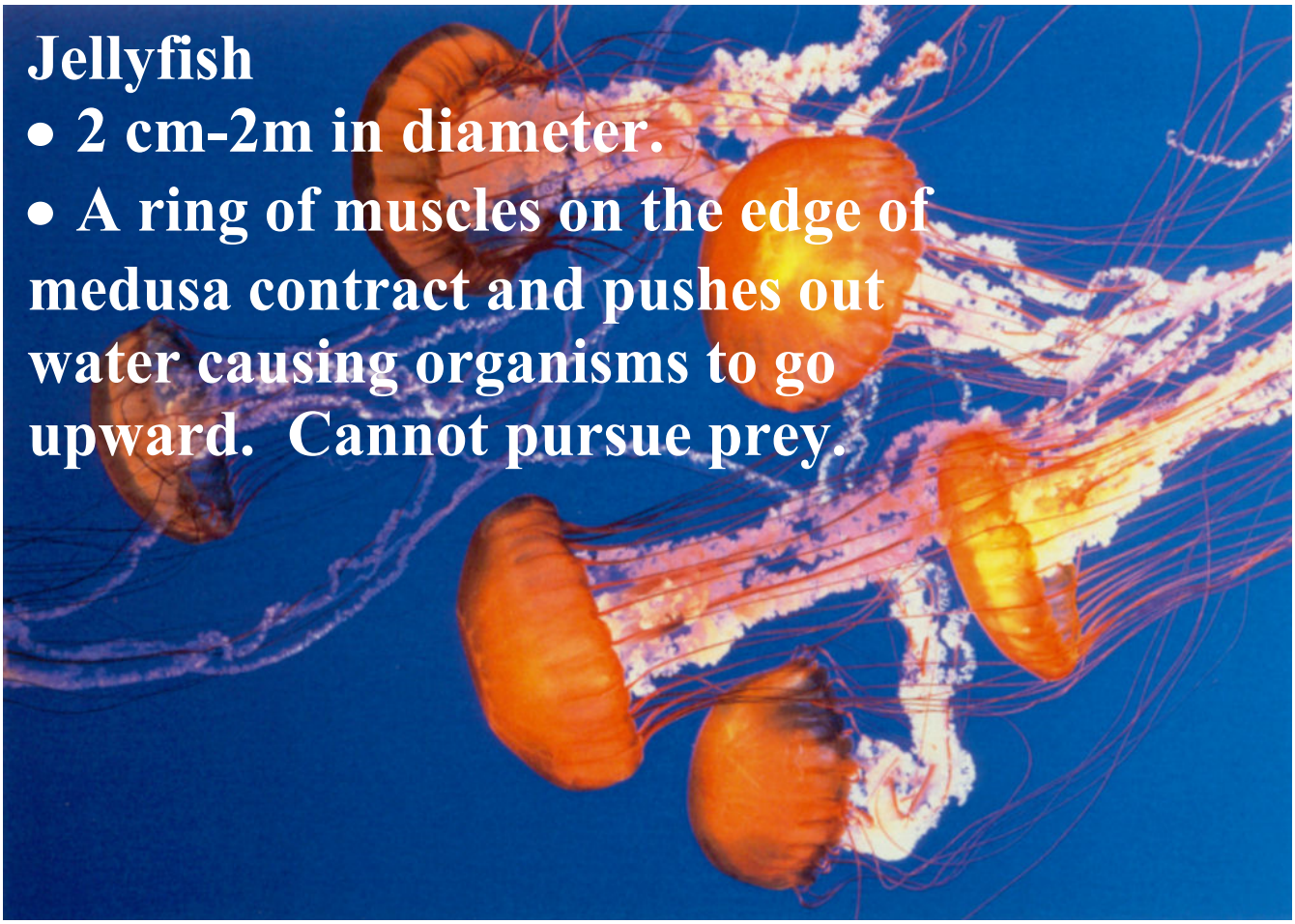
- **Cnidarians have nerve, muscle and digestive tissues. A nerve net circles the body. If a hydra is touched, it flattens showing that the nerves and muscles are in sync.**

Cnidarians capture food by stinging prey and sometimes inject toxins. These stingers are found in sacs called nematocysts. They paralyze the prey.

Captured food is digested in a saclike cavity that has a single opening. Entry and exit is controlled by muscle therefore they can ingest larger animals than the sponges can.

REPRODUCTION

Most involved in sexual reproduction between male and female medusa. The larvae (offspring) after several days of free-swimming attach to the bottom and develop into polyps, which grow and reproduce asexually and eventually, produce buds that develop medusa and the cycle continues (the medusa release eggs and sperm, which make the larva).


Jellyfish
• 2 cm-2m in diameter.
• A ring of muscles on the edge of medusa contract and pushes out water causing organisms to go upward. Cannot pursue prey.

Anemones

Have a number of compact compartments on the interior space. Stinging cells also line the inner wall.

(c) Herb Segars

Corals

Only have a polyp form. Secrete a wall of calcium carbonate around them. They grow in colonies. New generations form on top of old.

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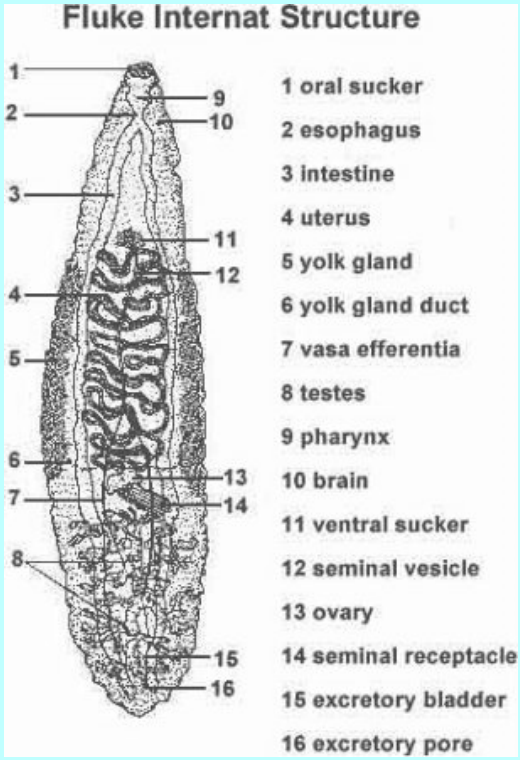
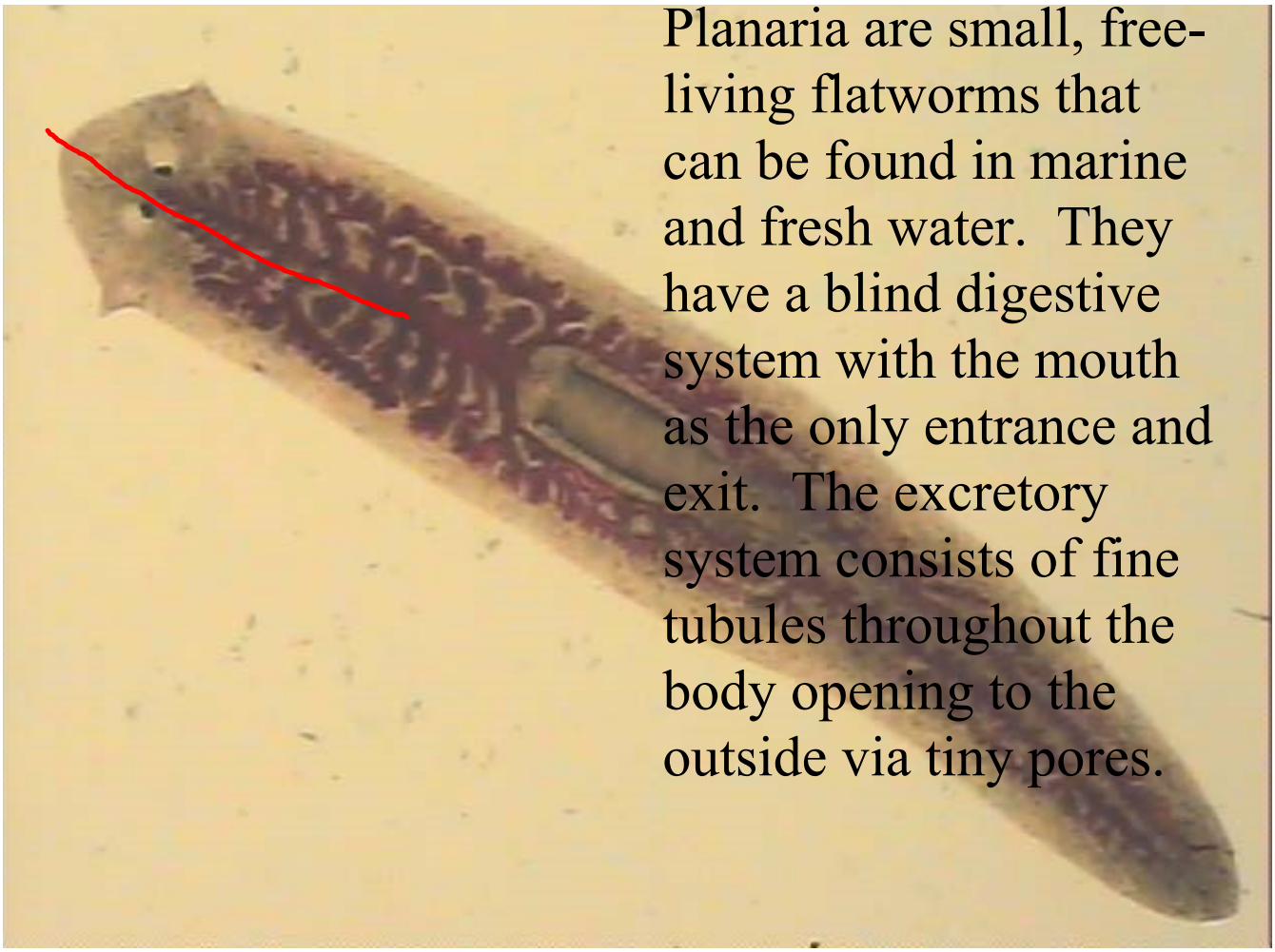
Phylum Platyhelminthes- Flatworms

They have bilateral symmetry and a primitive brain. These organisms represent an increase in complexity. They have three layers including a mesoderm, true organs, and rudimentary organ systems for digestion and excretion.

Flatworms are the most primitive organism to show cephalization. They may be free-living or parasitic. Parasites live on or in another organism and obtain nutrition from their host.



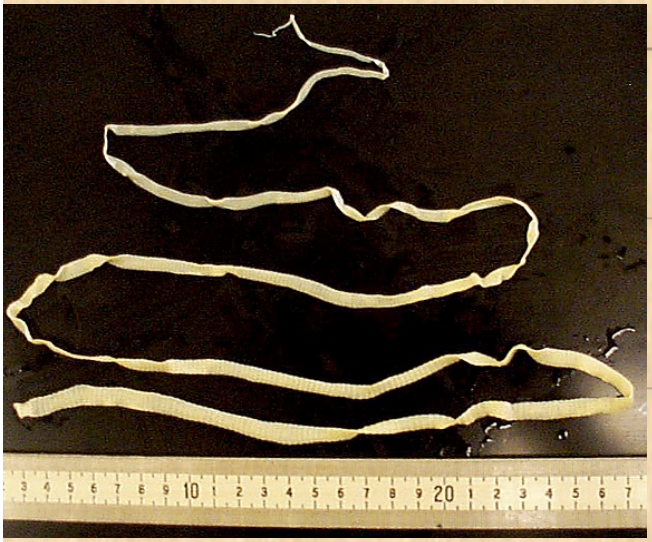


Planaria are small, free-living flatworms that can be found in marine and fresh water. They have a blind digestive system with the mouth as the only entrance and exit. The excretory system consists of fine tubules throughout the body opening to the outside via tiny pores.

They have a concentration of nerve cells at the anterior end of the worm which resembles a primitive brain. They have 2 nerve cords made up of nerve cells that run along the ventral surface of the worm towards the tail. These coordinate and interpret sensory information.

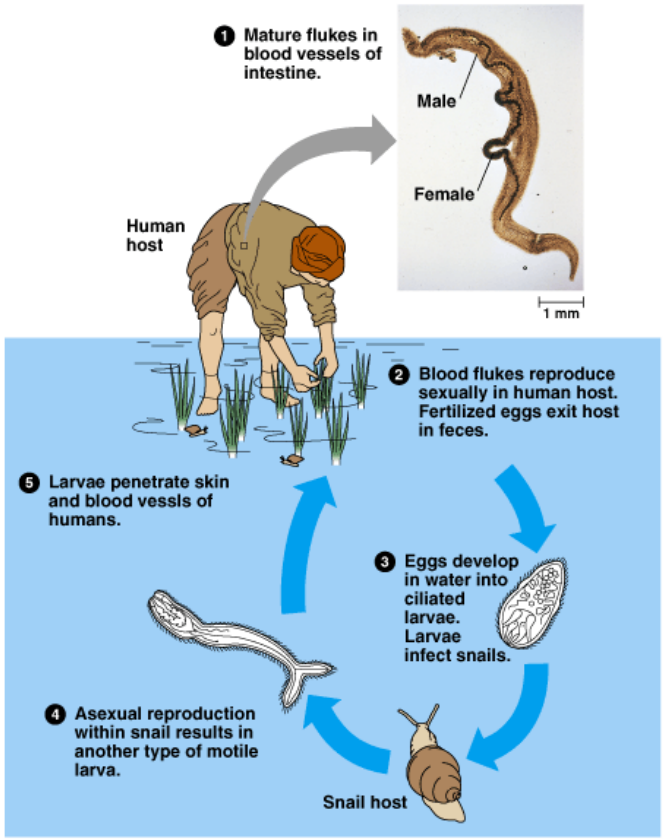
Flatworms are hermaphroditic with reproductive systems present only during the mating season. They are also able to regenerate.

Hermaphrodites have both sex organs.



Parasitic flatworms are usually small and they usually do not kill their host. Tapeworms live in the digestive tract of some animals and live off their food. They live in an environment that is constant and do not require much sensory information. As a result, they do not have many sensory receptors. Many do not have digestive systems as they live in an environment that provides them with pre-digested food. Tissue parasites have primitive digestive systems as their food is not yet digested.

The reproductive system is highly evolved and produces thousands of eggs. Because there is no digestive system in internal parasites, there is more room for eggs. Intestinal parasites have a modified epidermis called a tegument. It protects the flatworm from digestive enzymes and the immune system of the host. Some have a similar covering called a cuticle.



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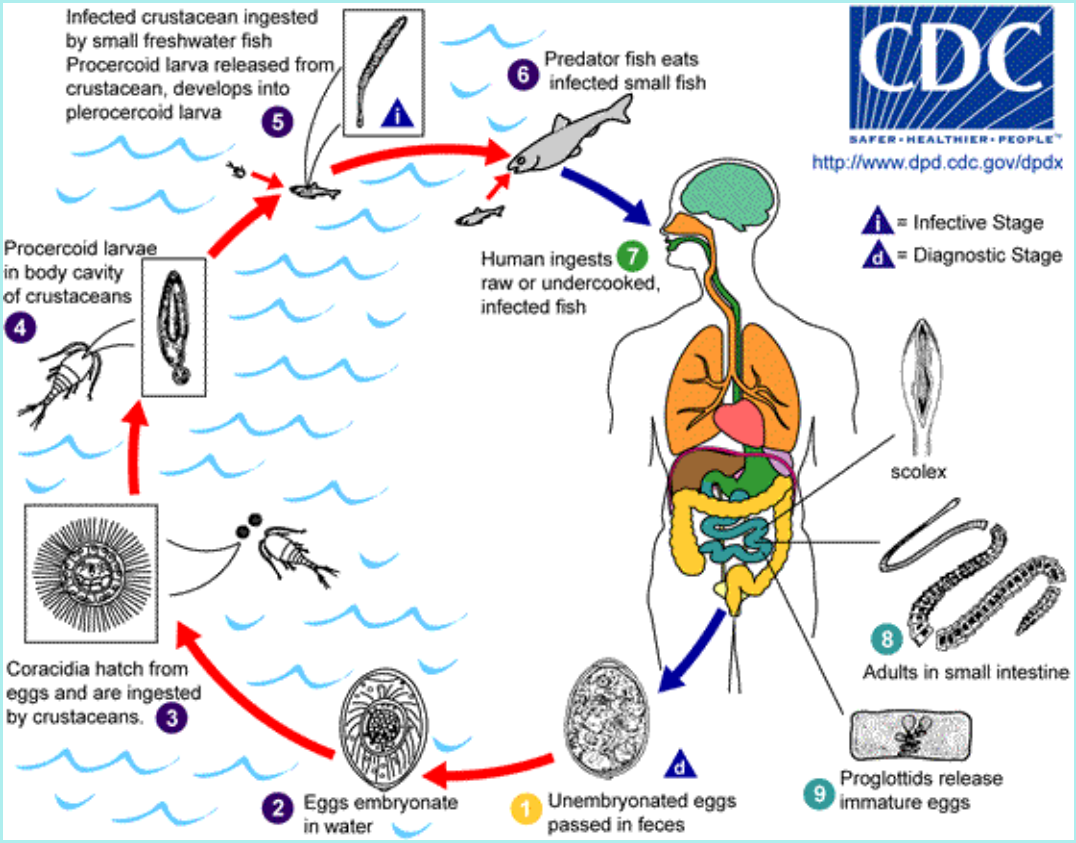
Infected crustacean ingested by small freshwater fish
Procercoid larva released from crustacean, develops into plerocercoid larva
5
i
6 Predator fish eats infected small fish
CDC
SAFER·HEALTHIER·PEOPLE™
http://www.dpd.cdc.gov/dpdx
i = Infective Stage
d = Diagnostic Stage
Procercoid larvae in body cavity of crustaceans
4
Human ingests 7 raw or undercooked, infected fish
scolex
8
Adults in small intestine
Coracidia hatch from eggs and are ingested by crustaceans. 3
d
9 Proglottids release immature eggs
2 Eggs embryonate in water
1 Unembryonated eggs passed in feces

Questions 1,3

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Some parasitic nematodes also infect plants such as the potato cysts nematode. It is thought to have evolved at the same time as the potato. This is called coevolution. The golden nematode affects potatoes in North America. Measures are in place to keep it from spreading.

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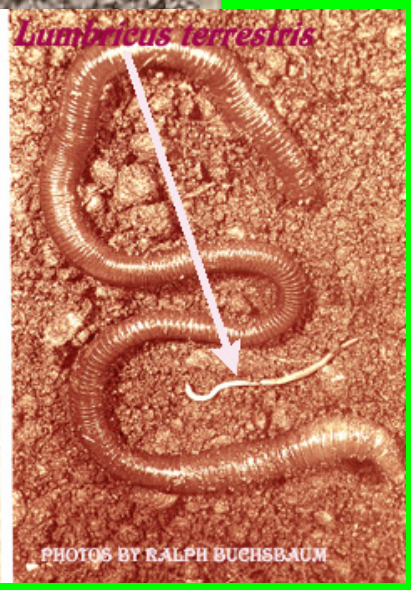
Questions 1,3,4,6

The Segmented Worm
(Phylum Annelida)
• They have a true coelom.
• Segmentation is the repetition of body units that contain similar structure (permits greater specialization).
• 3 Classes



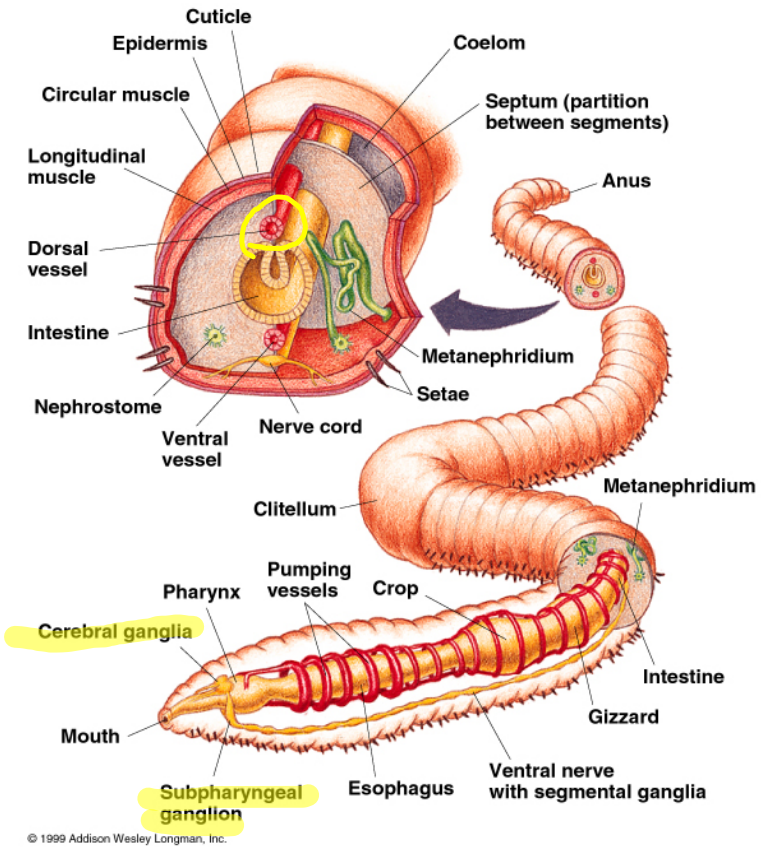
1. Class Oligochaeta

This is the common earthworm and they have few (oligo) bristles (chaeta). They are important to agriculture because they dig into the ground allowing drainage and air to seep in. They are also decomposers.

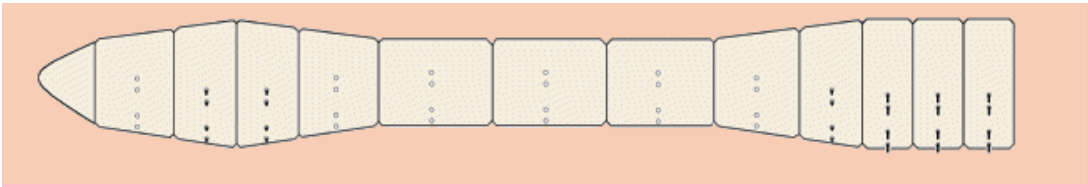
2. Class Polychaeta
They have many (poly) bristles (chaeta). They are marine worms and have parapodia (side feet) on the sides of each segment, which aid in movement and gas exchange.

Class Hirudinea
(Leeches)

Found in slow moving water environments. The leech cuts through the host to create a flow of blood. Hospitals use them to prevent clotting (blood blockage). Leeches can go a year without eating.



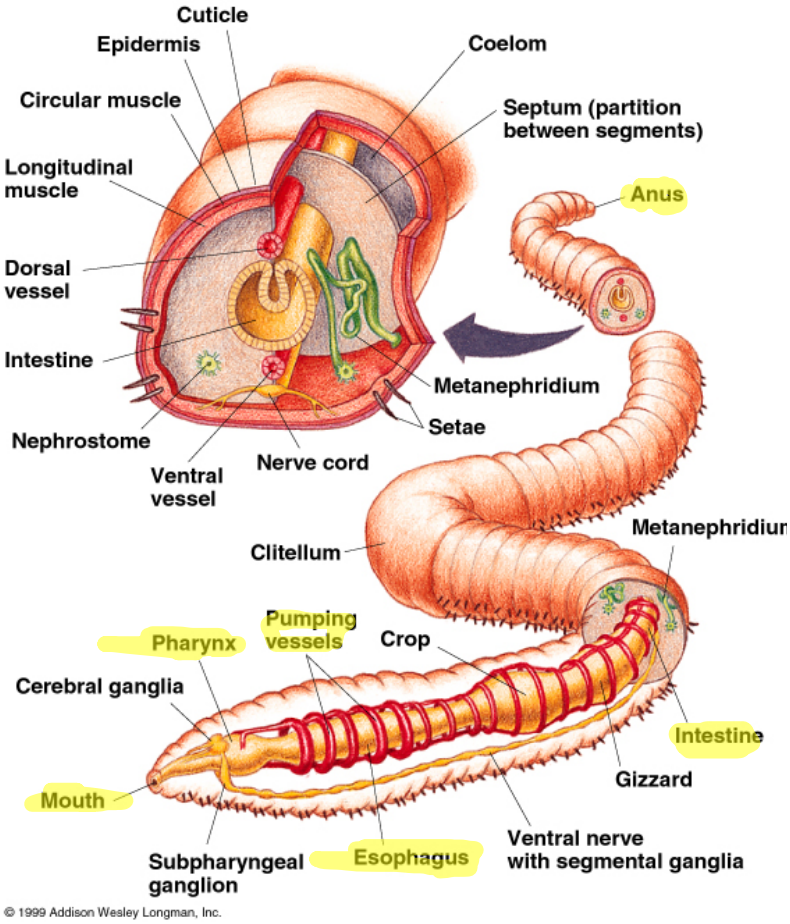
Each segment is separated by a septum (wall). They have muscular tissues, which allows the segments to contract and expand which allows them to move. Peristalsis is the rhythmic, wavelike contractions of muscle. They have bristles called setae on each segment that allows the worm to anchor itself and assists in locomotion.

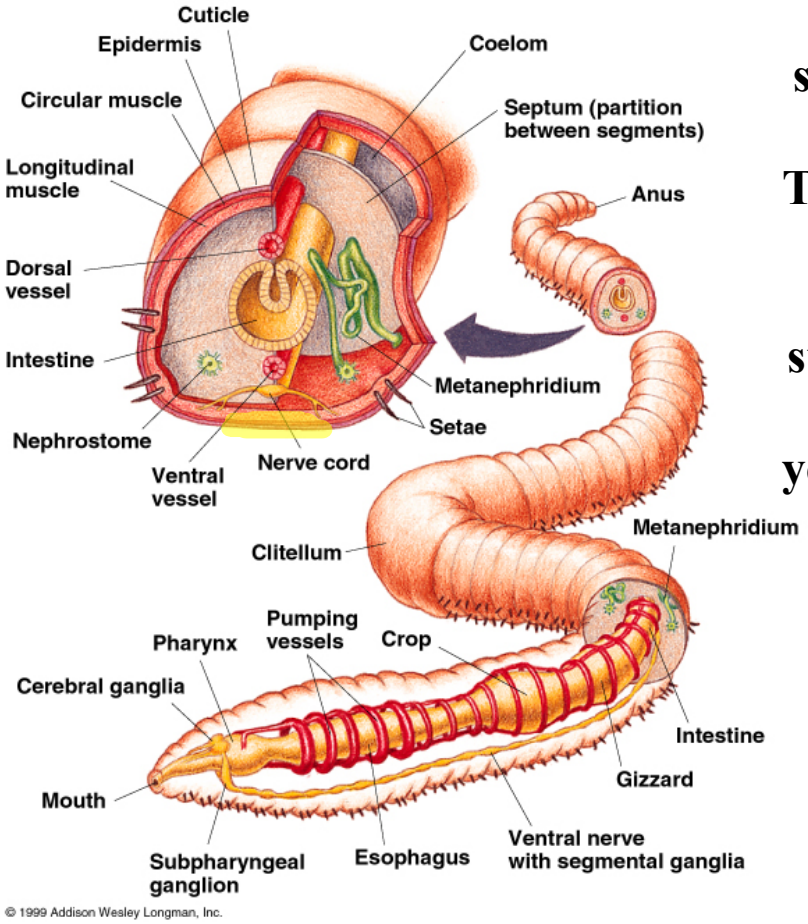


<u>Peristalsis</u> is the rhythmic, wavelike contractions of muscle.

These worms have a mouth and muscular pharynx which ingests food, passes it through the esophagus and intestine then the food exits via the anus.

Annelids also have a closed circulatory system in which blood flows in closed vessel (like us) branch into all parts of the body. They do not have a central heart, but there are muscular blood vessels which act as pumps.





Dissection

Earthworms are hermaphroditic but sperm are transferred through copulation. The clitellum secretes a protective covering (cocoon) which surrounds the egg and protects them. The young develop and exit fully developed.

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1,4.

mantle

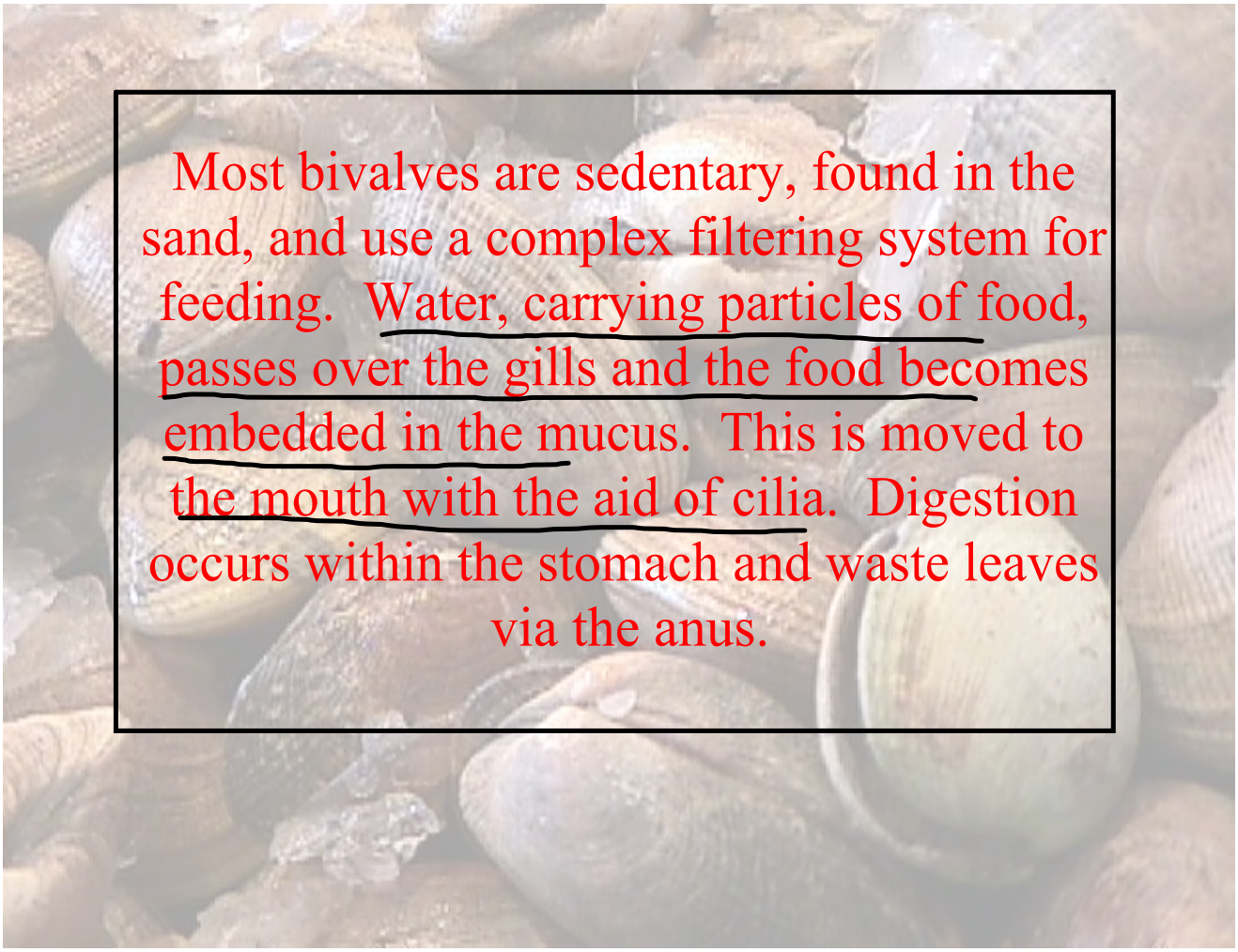
Phylum Mollusca-Clams, squid, octopods and snails all share similar characteristics, some of which are evident only in embryonic development. In mollusks, a single opening forms at the surface of the gastrula and becomes the mouth. The anus forms from a secondary opening. All mollusks go through a larval stage called a trochophore larva which have cilia that bring food toward the mouth.

Chitons are marine animals that eat algae and small animals from rocks. Their bottom surface is a muscular foot and their upper surface consists of 8 overlapping shell valves.(Protection) Oxygen is extracted from the water by gills and oxygenated blood is pumped by a heart.

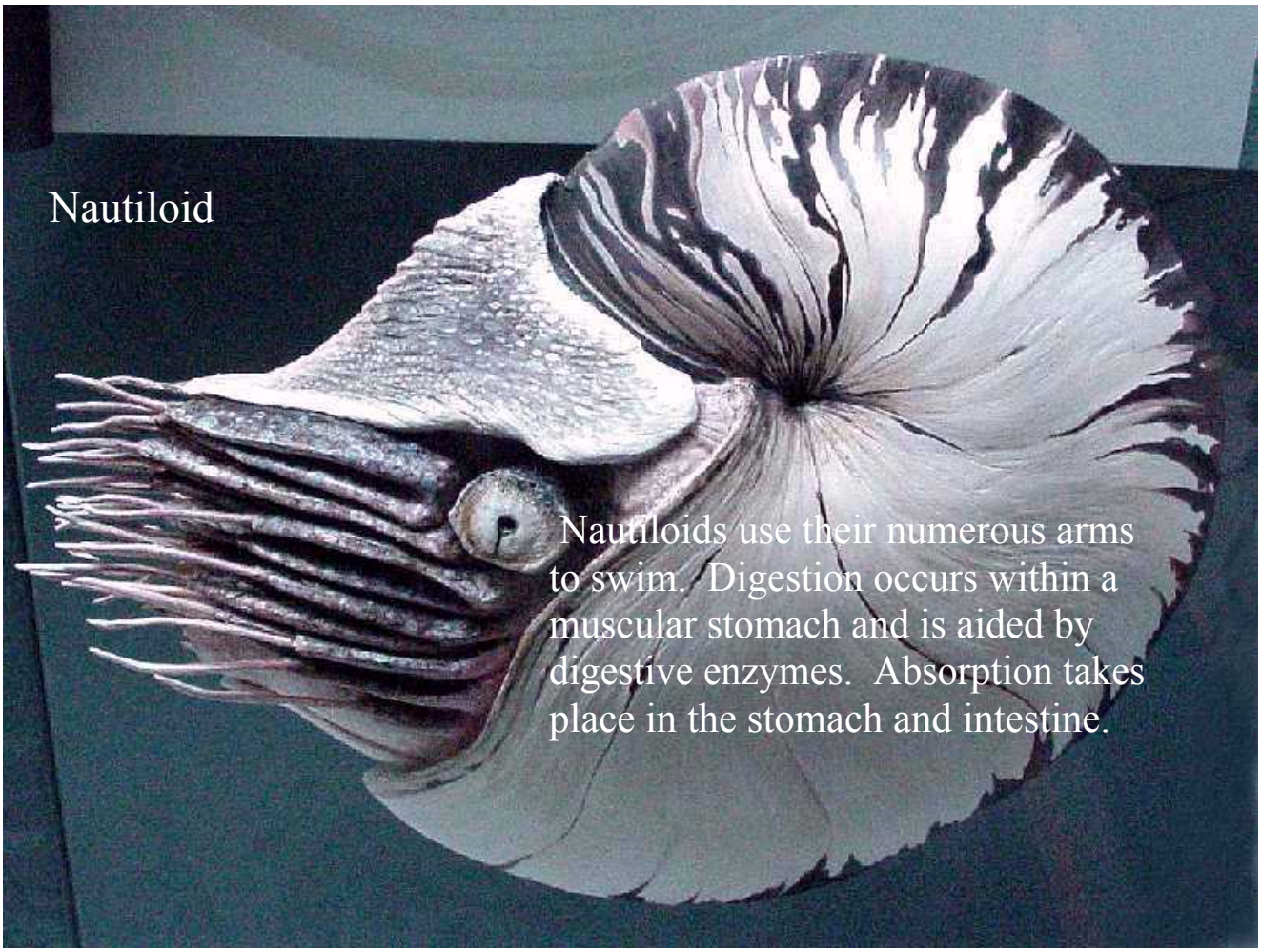
Four classes of mollusks
Chitons
Gastropods-snails and slugs
bivalves-clams, mussels and oysters
cephalopods-squid, octopi, nautiloids

Gastropoda, the largest group of mollusks, including snails, and are characterized by their heavy coiled shell. Their foot has a hard plate and protects the soft body when withdrawn.

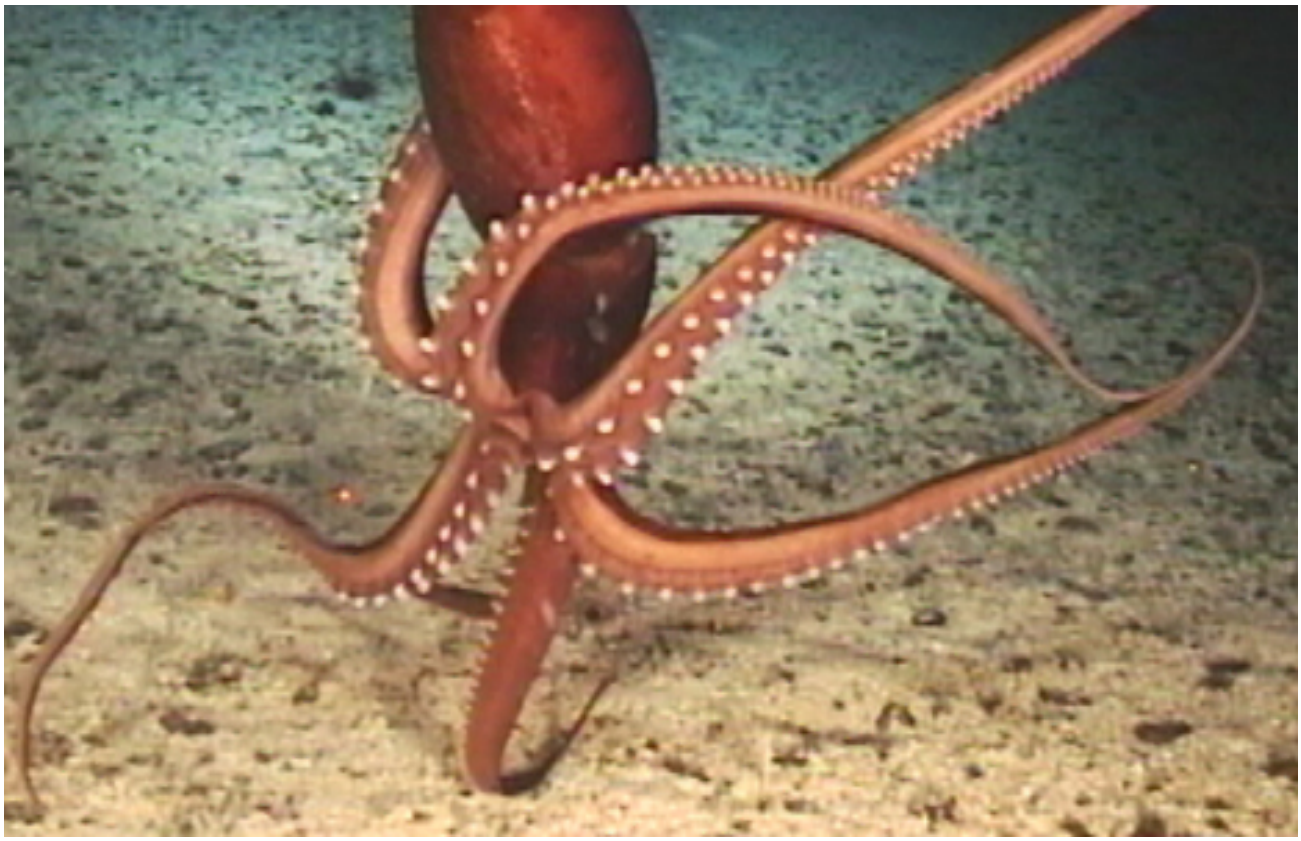
Bivalvia consist of clams, mussels, and oysters, and they are an important food source. The body is between two protective valves which are connected by a ligament that holds them apart along one edge.

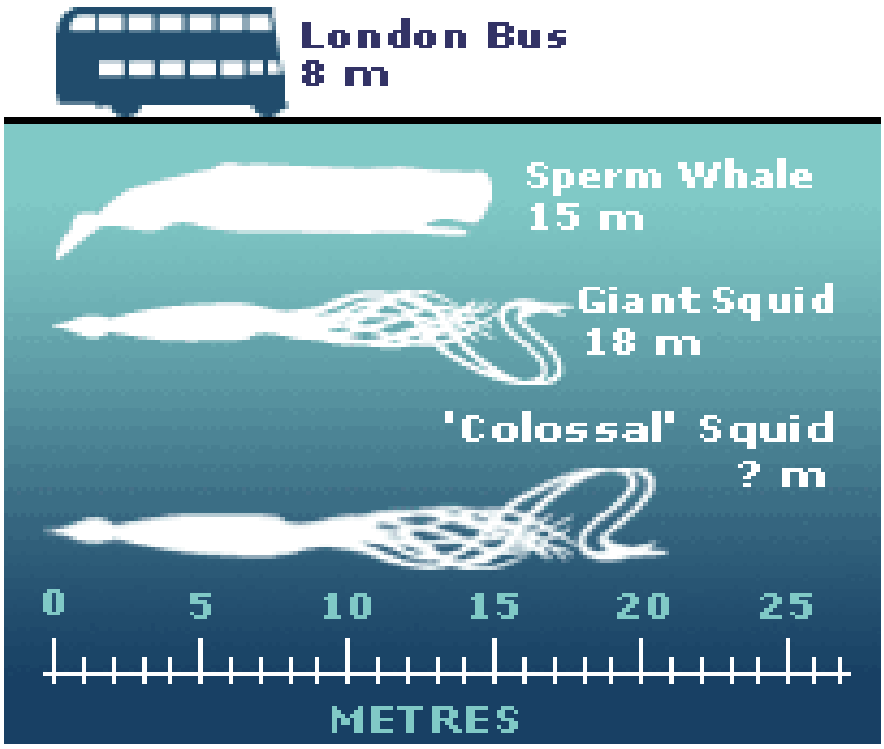

Most bivalves are sedentary, found in the sand, and use a complex filtering system for feeding. Water, carrying particles of food, passes over the gills and the food becomes embedded in the mucus. This is moved to the mouth with the aid of cilia. Digestion occurs within the stomach and waste leaves via the anus.

Cephalopoda refers to head-footed organisms such as squid, octopods, and nautiloids. Nautiloids have a full outer shell. Octopods have 8 appendages with suckers, while squid have 10 appendages with only the longest 2 having suckers. Appendages, or tentactles, are used for grabbing prey and bringing it towards the mouth.


Nautiloid
Nautiloids use their numerous arms to swim. Digestion occurs within a muscular stomach and is aided by digestive enzymes. Absorption takes place in the stomach and intestine.

These organisms have complex respiratory and circulatory systems. They are capable of fast movement and require the efficient delivery of oxygen to tissue of the body. Squid and octopods have a muscular mantle and use water jets to propel themselves through the water. Their circulatory system consists of a gill heart which pumps blood to the systemic heart which in turn pumps blood to the rest of the body.




London Bus
8 m
Sperm Whale
15 m
Giant Squid
18 m
'Colossal' Squid
? m
0
5
10
15
20
25
METRES

They have a large brain and the ability to learn, solve problems, and remember. The advanced respiratory, circulatory and nervous systems are well developed and this allows them to be effective predators. They also have image forming eyes.

http://www.youtube.com/watch?v=p9A-oxUMAy8

http://www.youtube.com/watch?v=ocWF6d0nelY