

CLADE METAZOA**CLADE EUMETAZOA****CLADE BILTERIA****CLADE PROTOSTOMIA****CLADE LOPHOTROCHOZOA****Phylum Mollusca****Class Polyplacophora – “many plate bearers”****Habitat(s) - Marine**

Circle the characteristic(s) possessed by members of this class, which are shared with other molluscs (page 360 – Taxonomy of Phylum Mollusca):

Mantle

Tongue with teeth

Larval form shared with some annelids

Distinctive characteristics – circle the answer or answer the question (pages 338-339):

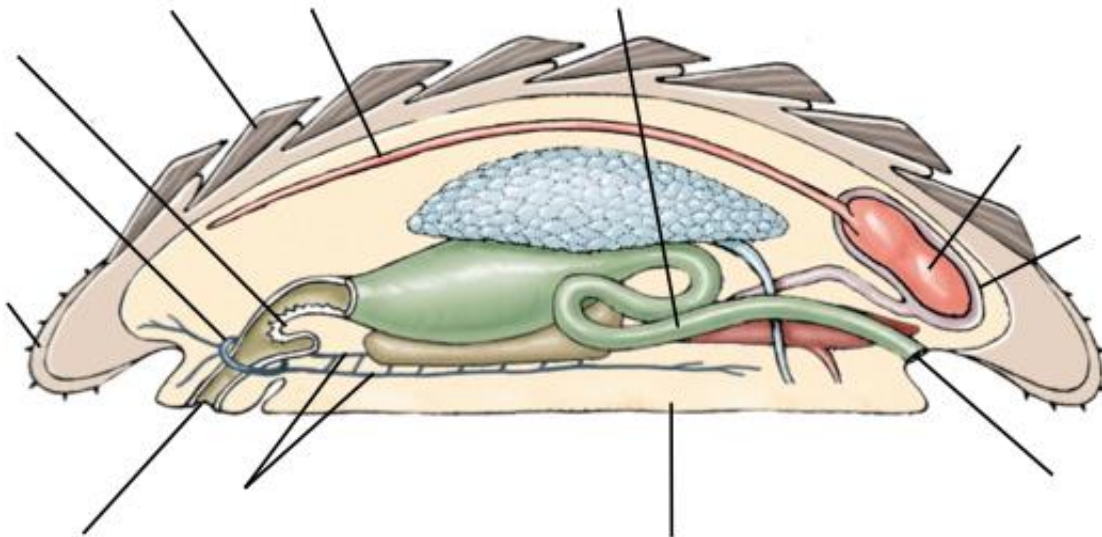
Chitons are:

Laterally flattened

Dorsoventrally flattened

How many articulating plates do chitons possess? (page 338): _____

Label the diagram below, using the following list of terms: anus, aorta, foot, heart, mantle girdle, mouth, nerve cords, nerve ring, pericardium, plate, and radula (Figure 16.11 – page 340).



The shape of a chiton's foot is (page 360 – Taxonomy of Phylum Mollusca):

Broad	Narrow	
Conical	Wedge	Elongate

Head and cephalic organs (page 360 – Taxonomy of Phylum Mollusca):

Reduced	Well-developed
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Chitons are (page 360 – Taxonomy of Phylum Mollusca): Monoecious Dioecious

Is a veliger larval stage part of a chiton's life cycle? (page 360 – Taxonomy of Phylum Mollusca):

Yes	No
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Circulatory System (page 335 – Characteristics of Phylum Mollusca): Open Closed

Examples include: chitons

Class Scaphopoda

Habitat(s) - Marine

Circle the characteristic(s) possessed by members of this class, which are shared with other molluscs (page 360 – Taxonomy of Phylum Mollusca):

Mantle	Tongue with teeth	Larval form shared with some annelids
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Distinctive characteristics – circle the answer or answer the question:

The shells of tusk shells are (page 354): Univalve Bivalve

The shape of a tusk shells' foot is (page 360 – Taxonomy of Phylum Mollusca):

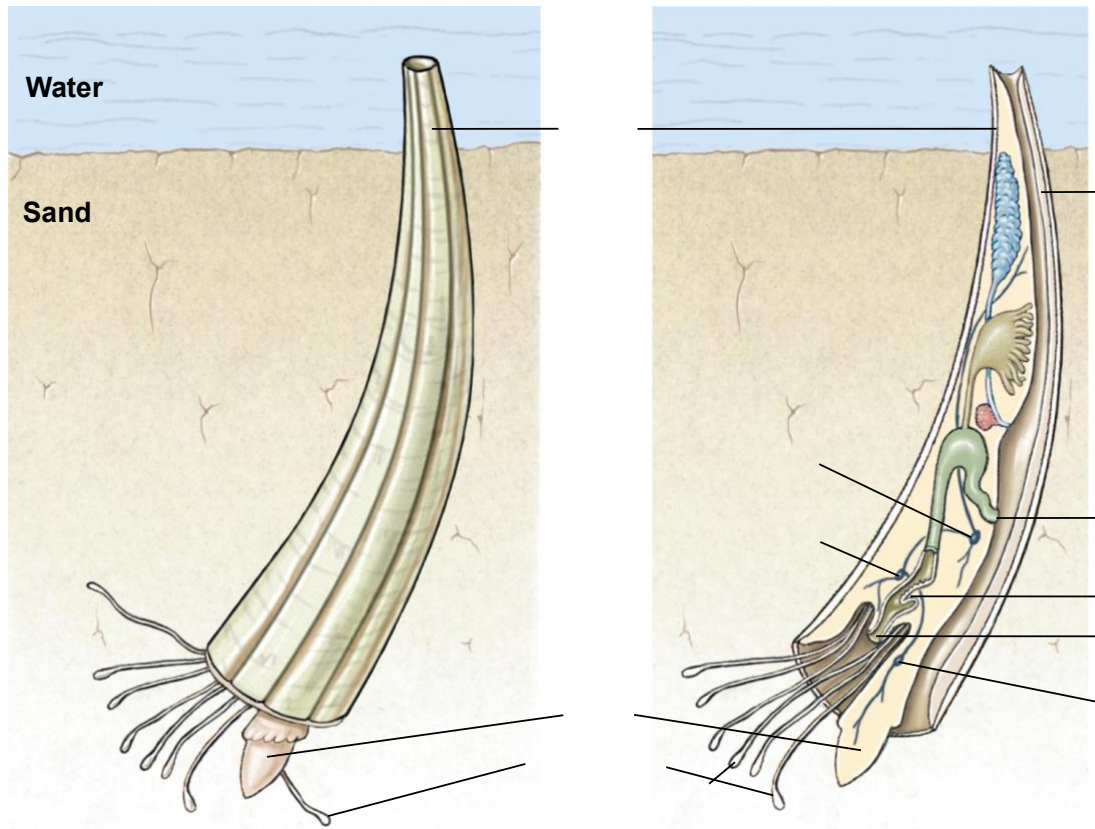
Broad	Narrow	
Conical	Wedge	Elongate

Head and cephalic organs (page 360 – Taxonomy of Phylum Mollusca):

Reduced Well-developed

The name given to the long tentacles of tusk shells is (page 354): _____**Tusk shells are (page 354):** Monoecious Dioecious**Is a veliger larval stage part of a tusk shell's life cycle? (page 354):** Yes No**Figure 16.8.** Photo of a snail veliger larva.**Circulatory System (page 335 – Characteristics of Phylum Mollusca):** Open Closed

Label the diagram below, using the following list of terms: anus, captacula, cerebral ganglion, foot, mantle, mouth, pedal ganglion, radula, shell, and visceral ganglion (Figure 16.37 – page 354).



Examples include: tusk shells, tooth shells

Class Gastropoda

Habitat(s) – Freshwater, Marine, Terrestrial, and Parasitic

Circle the characteristic(s) possessed by members of this class, which are shared with other molluscs (page 360 – Taxonomy of Phylum Mollusca):

Mantle

Tongue with teeth

Larval form shared with some annelids

Distinctive features – circle the answer or answer the question:

The shells of gastropods, if present, are (page 340):

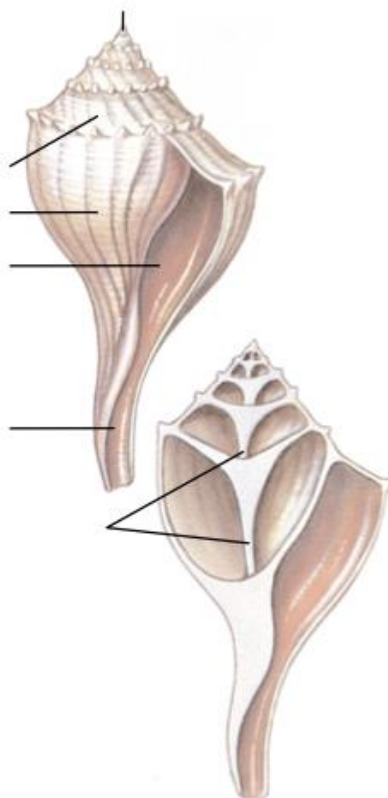
Univalve

Bivalve

When the shell of a gastropod is coiled, the coil can be flat, which is called _____, or the coils sit on top of each other, which is called _____ (page 342).

If the coils sit on top of each other, they can coil to the left or coil to the right. A left-handed coil is called _____, while a right-handed coil is called _____ (page 340).

Label the diagrams below, using the following list of terms: aperture, apex, body whorl, columella, siphonal canal, and whorl (Figure 16.13 – page 341).



The shape of a gastropod's foot is (page 360 – Taxonomy of Phylum Mollusca):

Broad Narrow

Head and cephalic organs (page 360 – Taxonomy of Phylum Mollusca):

Reduced Well-developed

Is a veliger larval stage part of a gastropod's life cycle? (page 360 – Taxonomy of Phylum Mollusca):

Yes No

Circulatory System (page 335 – Characteristics of Phylum Mollusca): Open Closed

Examples include: moon snails, tun shells, sea slugs, nudibranchs, tree snails, red slugs

***Prosobranchia* – “gills in front of heart”**

Distinctive characteristics – circle the answer or answer the question:

Shell: Present Absent

Term for the horny plate that covers the shell opening when the body is withdrawn into the shell (page 340): _____

Mantle cavity (page 345): Anterior Posterior

Gill(s) vs. heart (page 345): Anterior Posterior

Tentacles (page 345): One pair Two pairs

Prosobranchs are (page 345): Monoecious Dioecious

Habitat(s) – Freshwater, Brackish water, Marine, Terrestrial, and Parasitic

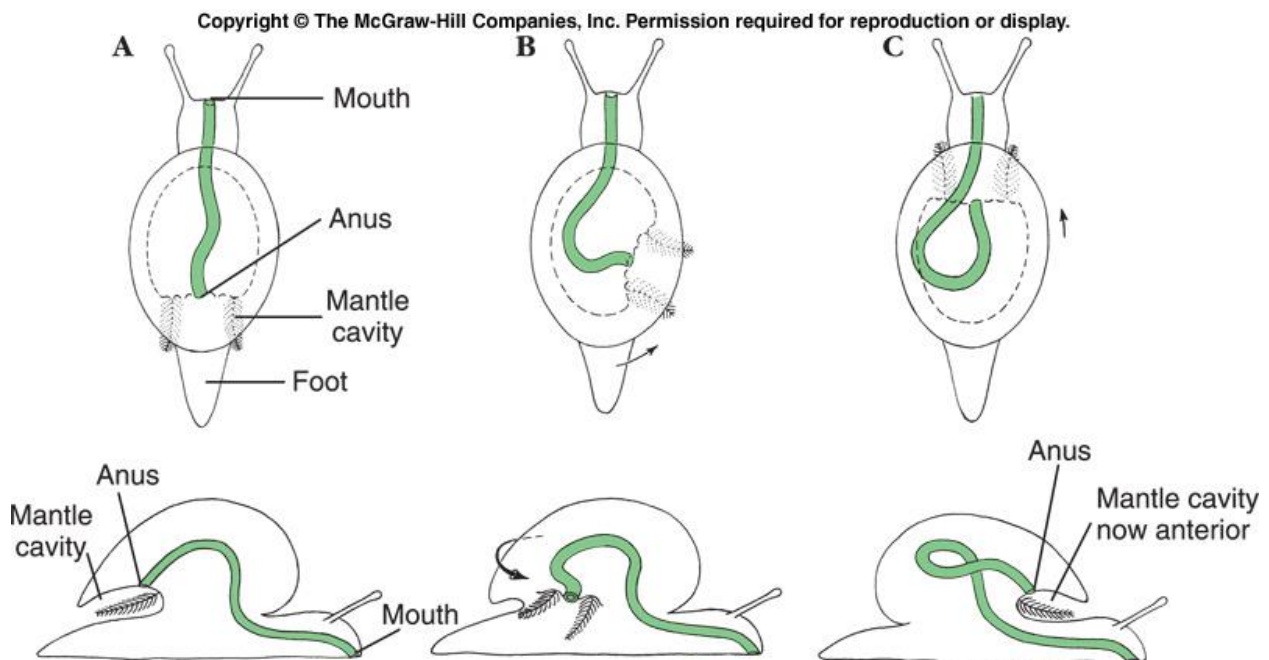


Figure 16.14 (from old version of textbook). Labeled diagram of torsion in a gastropod.

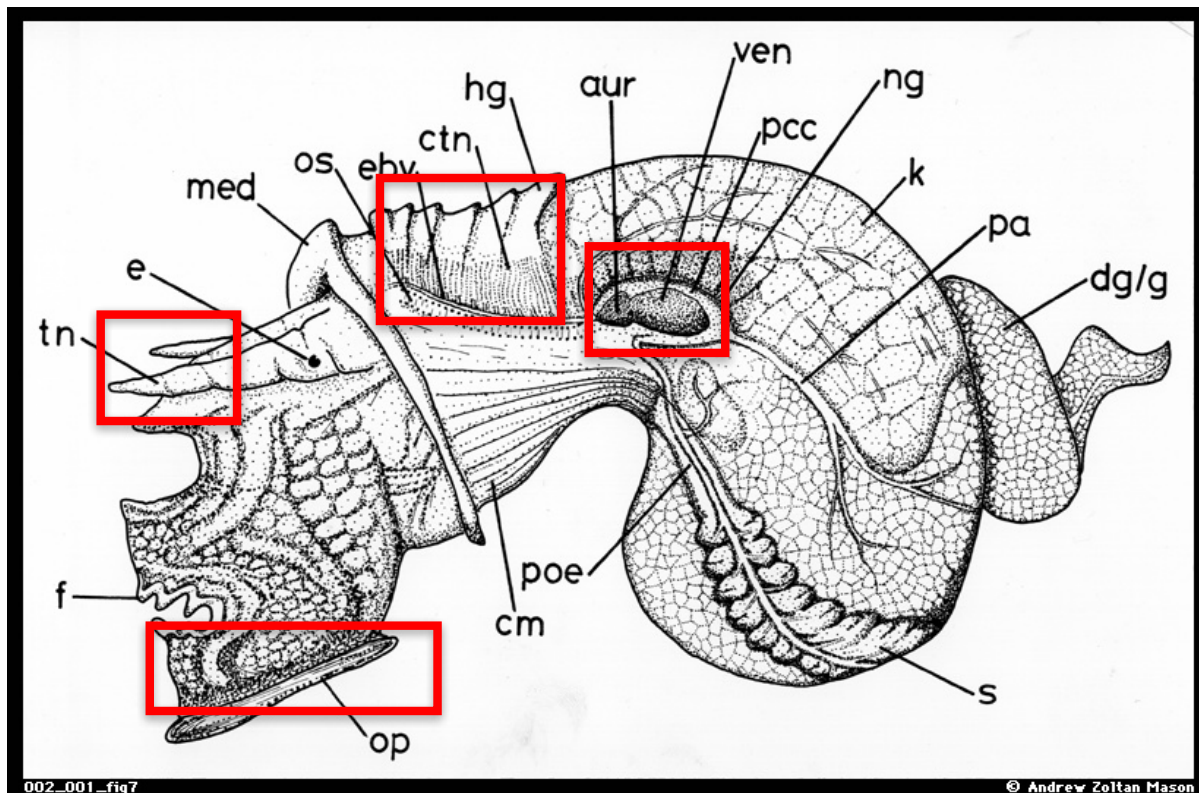


Figure Dearolf.1. Labeled diagram of the anatomy of a prosobranch. Gills – ctn; Heart – aur, ven; Operculum – op; Tentacles - tn

Examples include: abalones, whelks, conchs, common periwinkles, moon snails, tun shells, cowries, limpets, oyster drillers

Opisthobranchia – “gills to the right and behind the heart”

Distinctive characteristics – circle the answer or answer the question

Shell (page 346):	Present	Absent
Mantle cavity (page 346):	Anterior	Posterior
Gill(s) vs. heart (page 346):	Anterior	Posterior
Tentacles (page 346):	One pair	Two pairs

The modified second pair of tentacles is called (page 346): _____

Opisthobranchs are (page 346) : Monoecious Dioecious

Habitat(s) - Marine

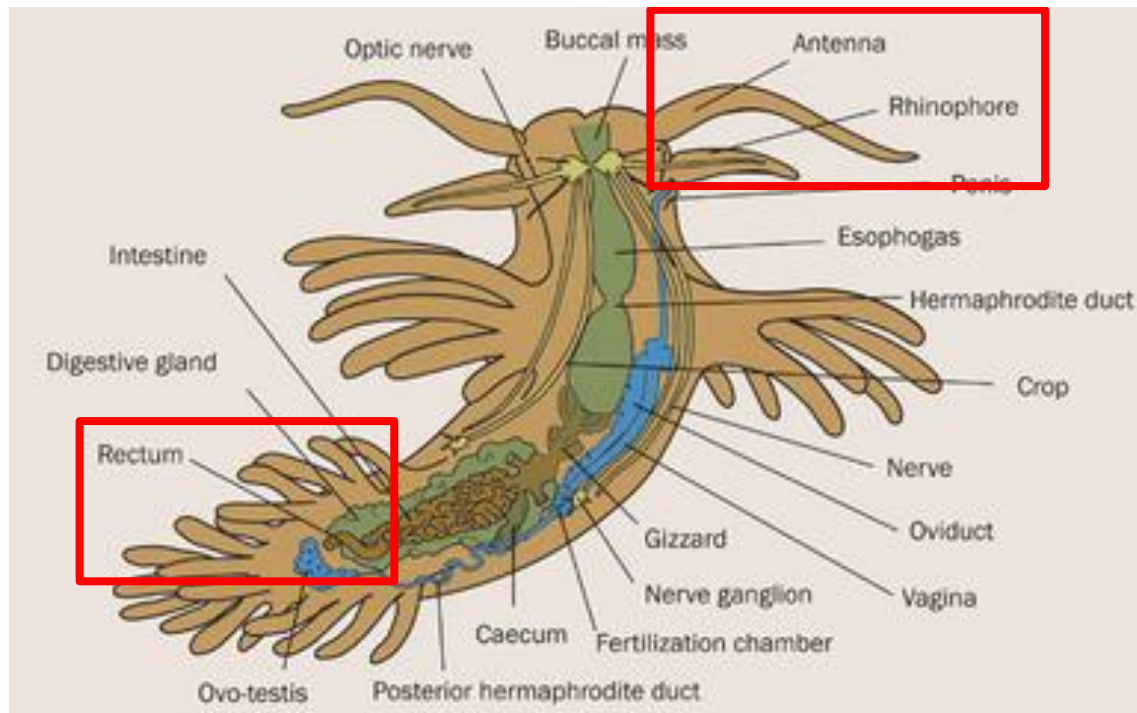


Figure Dearolf.2. Labeled diagram of the anatomy of an opisthobranch.

Examples include: sea slugs, sea hares, sea butterflies, nudibranchs, bubble shells

Pulmonata

Distinctive characteristics – circle the answer or answer the question

Shell: Present Absent

Mantle cavity (Figure 16.19 – page 345): Anterior Posterior

Respiratory surface vs. heart (Figure 16.19 – page 345): Anterior Posterior

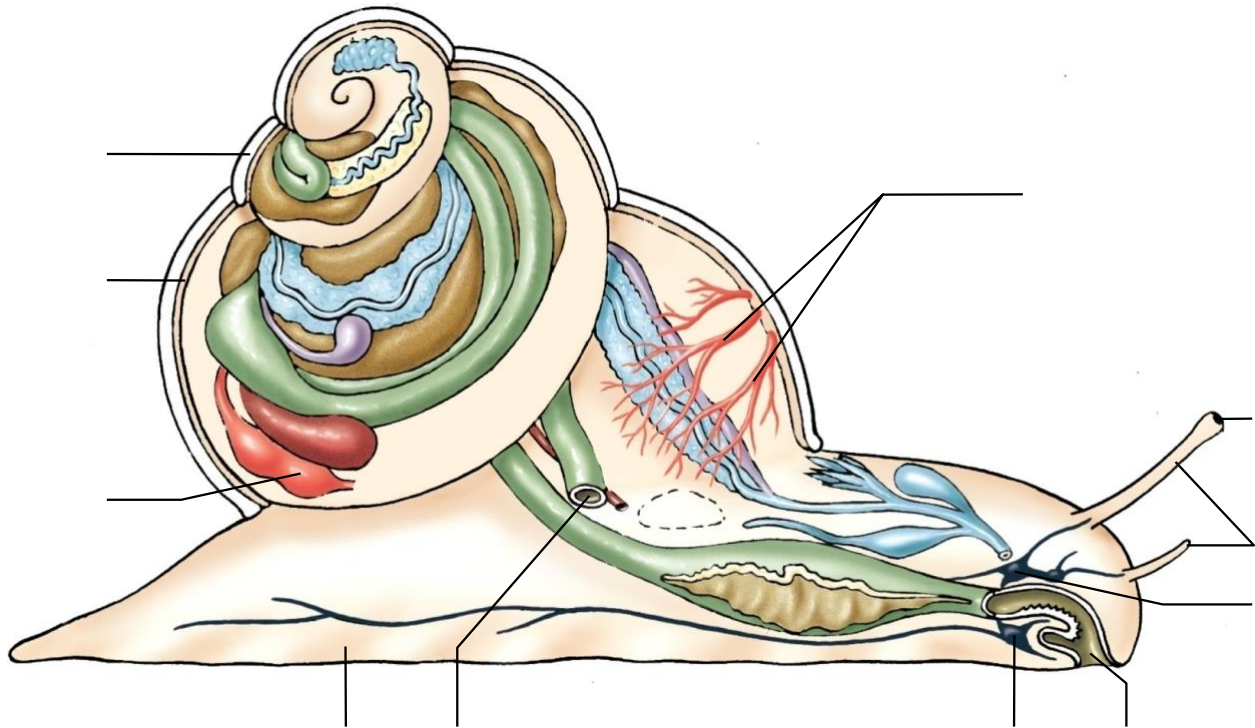
Structure utilized by pulmonates as their respiratory surface (page 347): _____

Tentacles (page 347): One pair Two pairs

Pulmonates are (page 347): Monoecious Dioecious

Habitat(s) – Freshwater, Brackish water, Marine, and Terrestrial

Label the diagram below, using the following list of terms: anus, cerebral ganglion, eye, foot, heart, mantle, mouth, pedal ganglion, pulmonary vessels (in mantle surrounding lung), shell and tentacle.



Examples include: tree snails, amber snails, lapidary snails, red slugs

Class Bivalvia

Habitat(s) – Freshwater, Brackish water, Marine, Terrestrial, and Parasitic

Circle the characteristic(s) possessed by members of this class, which are shared with other molluscs (page 360 – Taxonomy of Phylum Mollusca):

Mantle

Tongue with teeth

Larval form shared with some annelids

Distinctive characteristics – circle the answer or answer the question:

The shells of bivalves are (page 348):

Univalve

Bivalve

The shape of a bivalve's foot is (page 360 – Taxonomy of Phylum Mollusca):

Broad	Narrow	
Conical	Wedge	Elongate

Head and cephalic organs (page 360 – Taxonomy of Phylum Mollusca):

Reduced	Well-developed
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Bivalves are (page 360 – Taxonomy of Phylum Mollusca):

Monoecious	Dioecious
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Is a veliger larval stage part of a bivalve's life cycle? (page 360 – Taxonomy of Phylum Mollusca):

Yes	No
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Circulatory System (page 360 – Taxonomy of Phylum Mollusca): Open Closed

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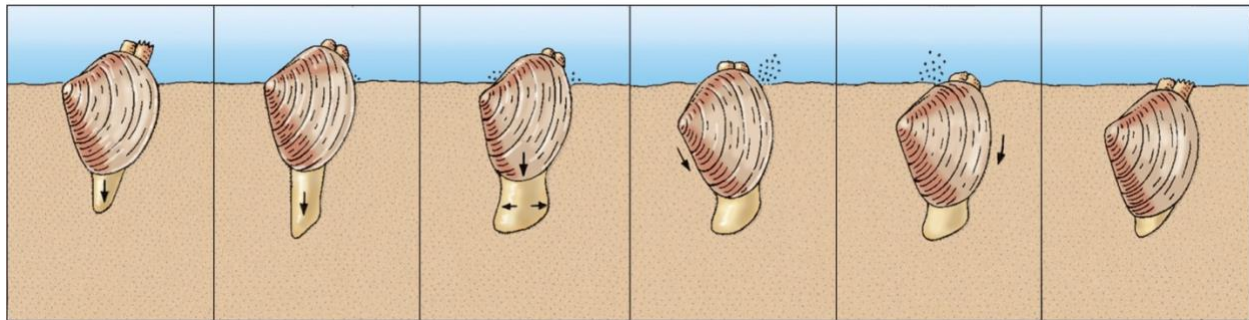
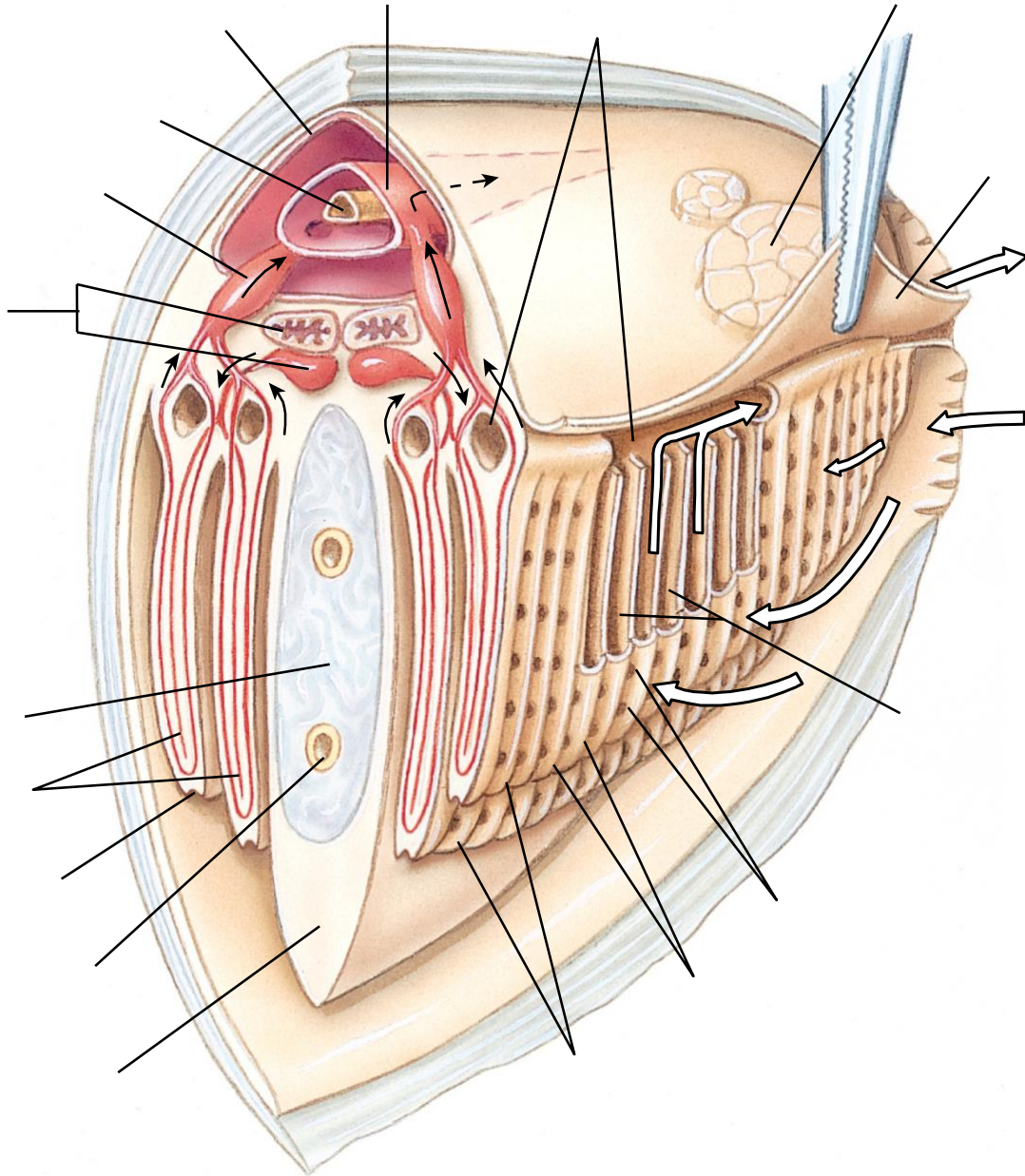


Figure Dearolf.3. Diagram of a bivalve digging itself into the substrate.

Label the diagram below, using the following list of terms: adductor muscle, atrium (auricle), excurrent aperture (siphon), food groove, foot, gill bars, gill pores (ostia), gonad, incurrent aperture (siphon), intestine, kidney, lamellae, mantle, mantle (cut and retracted), paired gills, pericardium, rectum, shell, suprabranchial chamber, ventricle, and water tubes.



Examples include: mussels, clams, scallops, oysters, shipworms

Class Cephalopoda**Habitat(s) - Marine**

Circle the characteristic(s) possessed by members of this class, which are shared with other molluscs (page 360 – Taxonomy of Phylum Mollusca):

Mantle Tongue with teeth Larval form shared with some annelids

Distinctive characteristics – circle the answer or answer the question:

The shells of cephalopods, if present, are (page 354-355): Univalve Bivalve

The shape of a cephalopod's foot is (page 354): Broad Narrow

Conical (Siphon) **Elongate (Arms and Tentacles)**

The foot of cephalopods has been modified into its _____ and _____ and _____ (page 354)

Head and cephalic organs (page 360 – Taxonomy of Phylum Mollusca):

 Reduced Well-developed

Cephalopods are (page 360 – Taxonomy of Phylum Mollusca):

 Monoecious Dioecious

Is a veliger larval stage part of a cephalopod's life cycle? (page 360 – Taxonomy of Phylum Mollusca):

 Yes No

Circulatory System (page 335 – Characteristics of Phylum Mollusca): Open Closed

Examples include: *Nautilus*, nautiloids, ammonites, cuttlefish, squid, octopods (octopi, octopuses), vampire squid

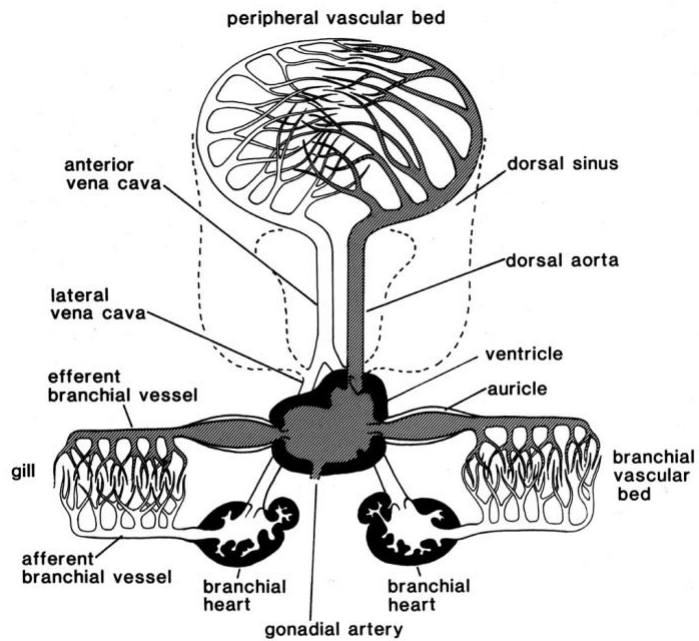


Fig. 6 Generalized cephalopod circulatory system (after Smith & Boyle 1983).

Figure Dearolf.4. Labeled diagram of the circulatory system of a coleoid.

Subclass Nautiloidea

Distinctive characteristics – circle the answer or answer the question

Shell: Present Absent

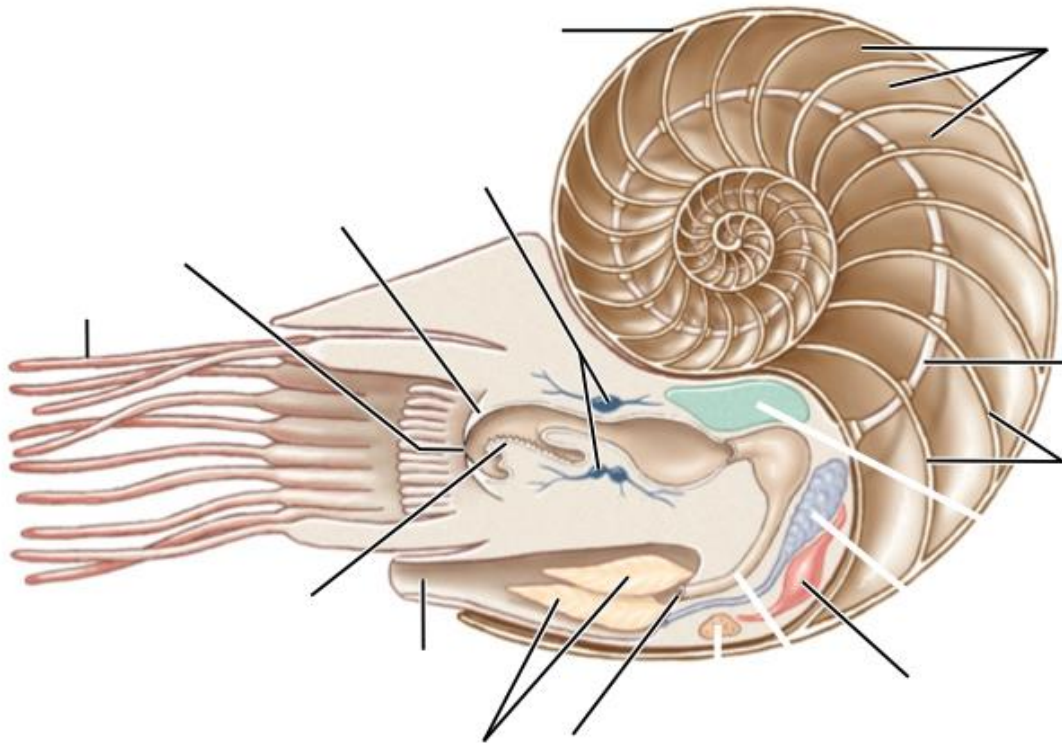
Pairs of gills: One Two

Suckers on tentacles: Present Absent

How many tentacles can be possessed by nautiloids?: _____

Tentacles are made adhesive by: _____

Label the diagram below, using the following list of terms: anus, "brain," chambers, funnel, gills, heart, jaw, mouth, radula, septa, shell, siphuncle, and tentacle.



Examples include: *Nautilus*, nautiloids

Subclass Ammonoidea

Distinctive characteristics – circle the answer or answer the question

All are extinct

Shell: Present Absent

How do the septa of ammonoid shells compare to those of nautiloids?: _____



Figure Dearolf.5. Photo of the internal anatomy of the shell of an ammonite.

Examples include: ammonites

Subclass Coleoidea

Distinctive characteristics – circle the answer or answer the question

Shell: Present Absent

Pairs of gills: One Two

Suckers on tentacles: Present Absent

How many hearts are possessed by coleoids?: _____

Eyes: Simple Complex

Examples include: cuttlefish, squid, octopods (octopi, octopuses), vampire squid

Superorder Decapodiformes

Distinctive characteristics – circle the answer or answer the question

Fins: Present Absent

Name of the shell of cuttlefish: _____

Name of the shell of squids: _____

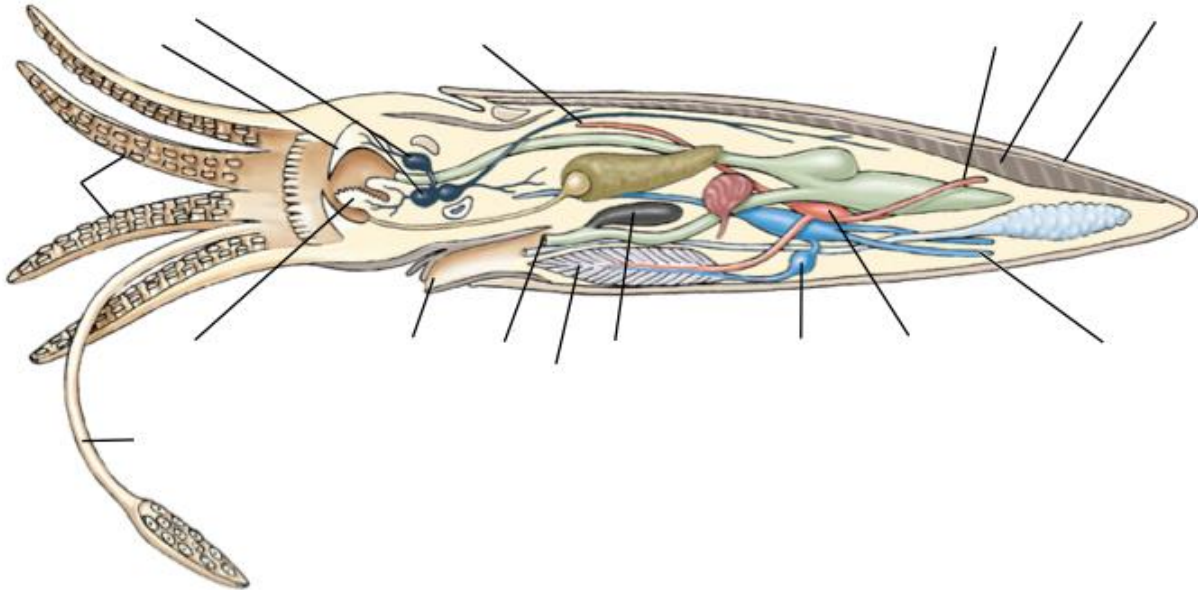
How many tentacles are possessed by decapodiformes?: _____

How many arms are possessed by decapodiformes?: _____



Figure Dearolf.6. Photo of a cuttlefish.

Label the diagram below, using the following list of terms: anterior aorta, anus, arms, brain, branchial heart, funnel with valve, gill, ink sac, jaw, mantle, mantle artery, pen, posterior vena cava, radula, systemic heart, and tentacle.



Examples include: cuttlefish, squid

Superorder Octopodiformes

Distinctive characteristics – circle the answer or answer the question

Fins: Present Absent

Shell: Present Absent

How many tentacles are possessed by octopodiformes?: _____

How many arms are possessed by octopodiformes?: _____



Figure Dearolf.7. Photo of a blue-ringed octopus.

Examples include: octopus, vampire squid

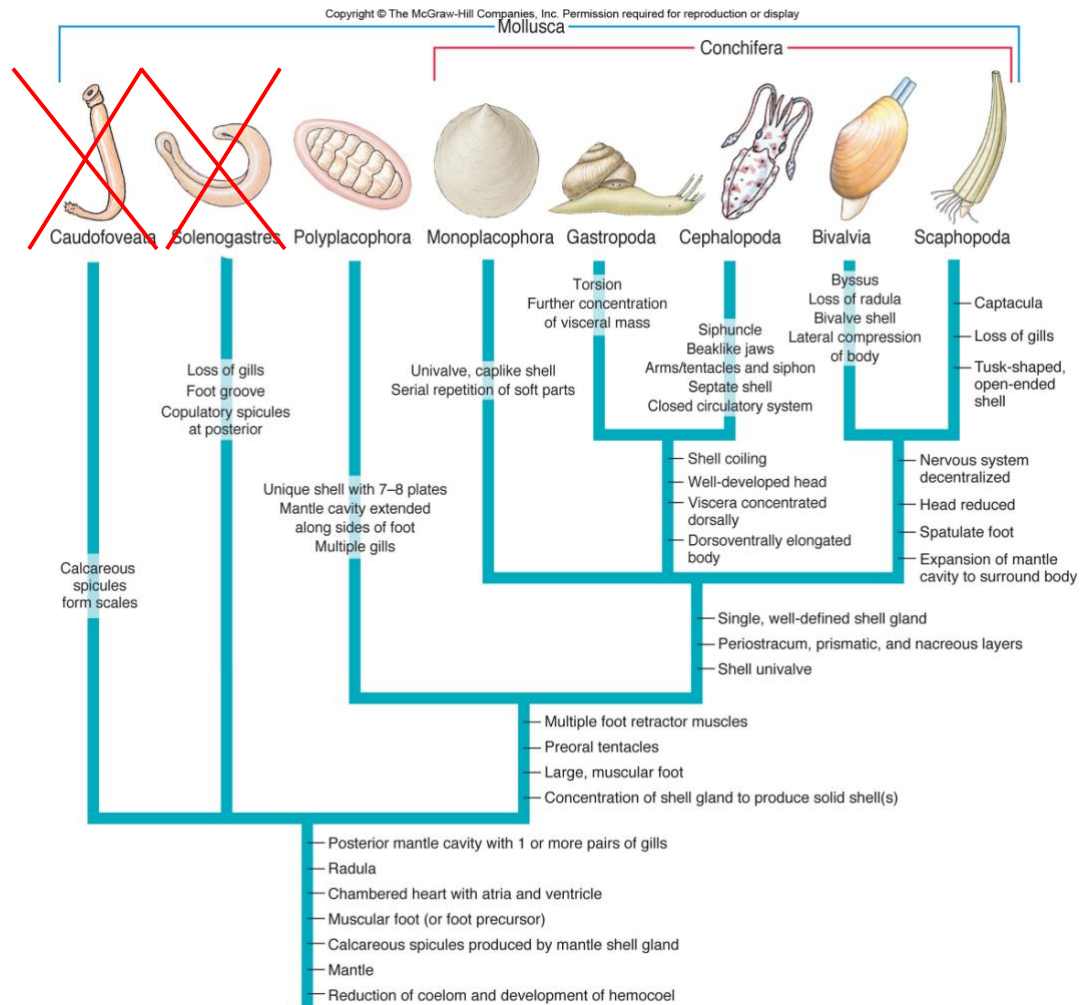


Figure 16.2. Cladogram depicting the hypothesized evolutionary relationships between the eight classes of molluscs – only need to know six classes for Lecture Exam.