

mollusks

gastropods, cephalopods, etc.

mollusks

- **PHYLUM MOLLUSCA**

- Triploblastic, bilateral symmetry, coelomate, one of the largest phyla
- 2 main body regions: Head/foot and visceral mass
- Protostomes – blastopore forms mouth first in development
- Most have protective shell (called a valve)
- Can be lost or modified
- Most have radula for feeding
- Gills (ctenidia) can be lost or modified

gastropods

- **CLASS GASTROPODA (Snails and slugs)**
 - One pair of ctenidia
 - Univalve
 - Radula scrapes algae – some can drill or stab (Poisonous Cone Shells)
 - Glide on mucus trail using muscular foot
 - Torsion – visceral mass rotates 180° so anus and gills are positioned above the head
 - Happens in development, may keep ctenidia free of debris, allows whole body to be retracted into shell



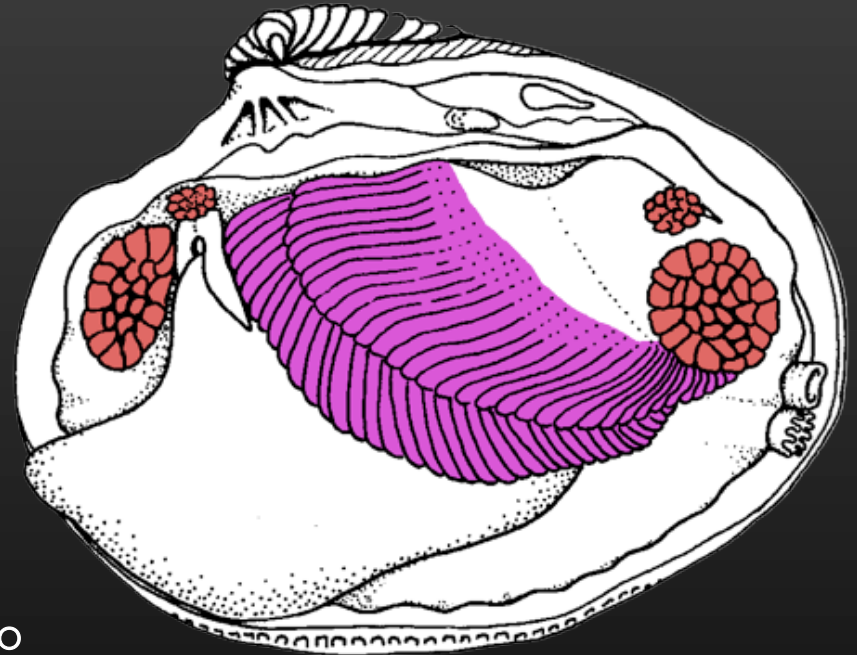
- SUBCLASS PROSOBRANCHIA
 - Sea Snails, ctenidia intact, foot operculum for defense
- SUBCLASS OPISTHOBRANCHIA
 - Sea Slugs, Sea Hares
 - No shell
 - Torsion is reversed
 - Lost ctenidia and evolved secondary gills called pseudobranchs
 - Can eat cnidaria to incorporate nematocysts for defense
- SUBCLASS PULMONATA
 - Land Snails, Slugs
 - Lost ctenidia
 - Use mantle cavity as a diffusion lung that relies on concentration gradients
 - Opening to mantle is called pneumostome

bivalves

- **CLASS BIVALVIA**

- **SUBCLASS LAMELLIBRANCHIA**

- Clams, oysters, mussels, scallops
- One pair of ctenidia
- Lack radula and head
- Shell divided and opens with hinge
- Burrow into sediment
 - Foot modified into digging shovel
- Ctenidia modified for filter feeding
- Muscles relax to open shell, contract to keep it closed
- Siphon brings in water (inhalant siphon – inhalant cavity – gills – exhalant cavity – exhalant siphon)



squid, etc

- **CLASS CEPHALOPODA**

- 2 pairs of ctenidia
- Shell usually reduced or lost
- Mantle wall muscular to push water out of siphon for escape
- Radula surrounded by beak
- Largest invertebrate brain – can learn like a dog or cat
- Complex eyes – some image forming
- Tentacles and arms have suckers
- Partially closed circulatory system with three hearts, 2 brachial and 1 systemic
- Very active predators



- SUBCLASS NAUTILOIDEA

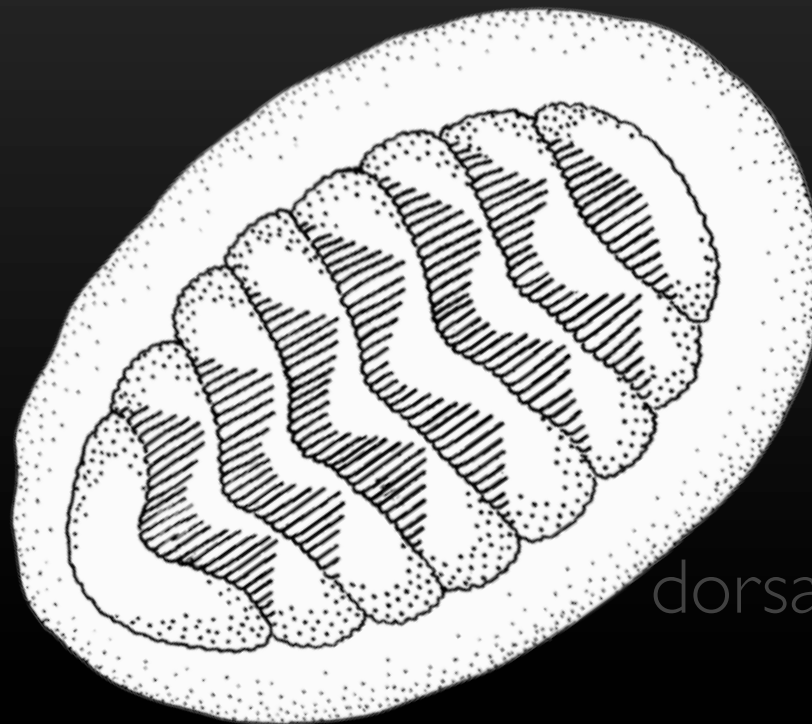
- Chambered Nautilus
- Only one with full shell
- Chambers of shell act as flotation devices
- Primitive eyes

- SUBCLASS COELEOIDEA

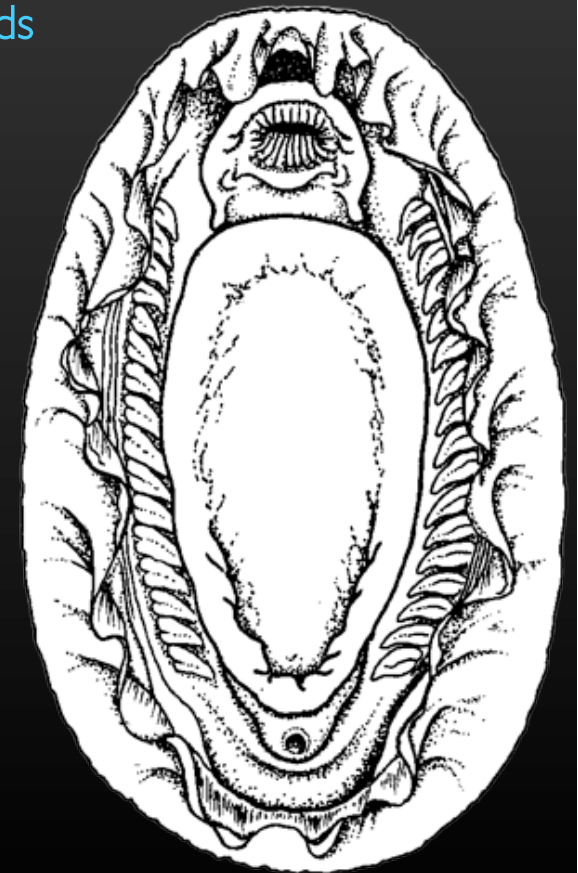
- Octopus, Squid, Cuttlefish
- Image forming eyes
- Highly developed chromatophores
- Cuttlefish – 8 arms, 2 tentacles, internal chambered shell
- Squid – 8 arms, 2 tentacles – book has this backwards, shell reduced to internal “pen”
- Octopus – 8 arms, no shell, some can be highly venomous

chitons

- **CLASS POLYPLACOPHORA (not on classification table in book)**
 - Chitons
 - No torsion, basic mollusc body plan, related to gastropods
 - Shell made up of 8 articulated pieces
 - Foot adapted for suction in intertidal zones
 - Many ctenidia around foot



dorsal



ventral