MOLLUSK NOTES

Phylum Mollusca

- Over _____ species of mollusks
- 7 recognized classes of Mollusca
  - Bivalvia
  - Gastropoda
  - Cephalopoda
  - Scaphopoda
  - Polyplacophora
  - Monoplacophora
  - Aplacophora
- All mollusks have:
  - Bilateral symmetry
  - Soft bodies
  - Head
  - Foot
  - Mantle
  - Coiled visceral mass (internal organs)
  - Internal or external shell (in most)
  - Brain

Class Bivalvia

- Also called Class Pelecypoda
- Bivalve – means ____ shells
- Common bivalves include clams, oysters, and mussels
- Bivalve Anatomy
  - Adductor muscles – used to keep shell _____.
  - Mantle – membrane that lines the inside of the shell and secretes calcium carbonate which builds the shell.
  - Gills
  - Incurrent Siphon – draws in water
  - Excurrent Siphon – expels water
  - Muscular foot – used to _____ in sand

Scallop

- Feeding Behavior
  - Filter Feeders – burrow in the sand using its foot and extends its siphons and draws in _____
- Mussels can attach to rocks by secreting _____ threads from a gland inside the foot.
- Oysters can attach to a substrate by secreting a cement-like substance from the lower shell.
- Scallops can "swim" to escape predators
  - Simple _____ line the outer edges and help the scallop sense light and movement
- Reproduction in Bivalves
  - External fertilization
  - External development
    - Larval stage is _____
    - When the shell develops they settle to the _____ and mature into adults
- Pearls
  - A pearl is formed in an oyster when a grain of _____ gets lodged in between the mantle and the shell
  - The mantle tissue reacts to the grain as a foreign body and secretes layers of shell around it– (nacre) forming the pearl.

Class Gastropoda

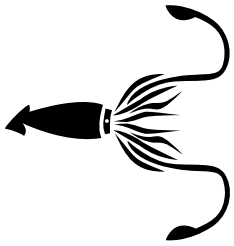
- AKA the univalves (_____ shell)
- Gastropod means "stomach-foot"
- Snails and sea slugs are common gastropods.
- Radula – tongue-like structure lined with _____ used to scrape off and ingest food
- Siphon – tube used to draw in oxygenated water for _____
- Foot – used for _____
- Operculum – thick tissue that covers the foot
- One-way digestive tract
- Open circulatory system
- _____-chambered heart

- Feeding habits of Gastropods
  - Herbivores
    - The Periwinkle grazes on _____ that grows on rocks
  - Scavengers
    - The Mud Snail feeds on _____ or dying organisms
  - Predators
    - The Moon Snail feeds on live clams
      - The snail secretes chemicals from a gland in its foot to soften the clam's shell.
      - It then uses its _____ to drill a hole through the shell
      - The snail then inserts its mouth through the hole and eats the soft-bodied clam
    - The Cone Snail uses toxins to kill its prey
      - A harpoon-like radula at the end of the snail's proboscis is used to spear the prey, and deliver _____
      - The potent toxins that these snails produce are being studied by scientists for their use in pain reliever medications.
- Reproduction in Snails
  - Some are hermaphrodites
  - Some have separate sexes
  - Internal fertilization
  - _____ development
    - Some females deposit fertilized eggs directly into water
    - Others enclose developing eggs in a protective covering
    - Whelk egg casing – aka "mermaid's necklace"
- NUDIBRANCHS!!
  - A shell-less gastropod
  - Dramatic coloration = warning to predators!

Class Cephalopoda

- Cephalopod means "head – foot"
- Most lack an external _____
- Swims by a kind of jet propulsion
  - Water is drawn into the mantle cavity
  - Mantle contracts and water is expelled through the _____.
  - The animal moves in the opposite direction
- Highly intelligent
- Includes octopus, squid, cuttlefish, and chambered nautilus
- Typical Structures and Behaviors
  - Large head and large eyes
  - Tentacles (modified _____)– used to capture prey
  - Suction discs line tentacles – used to grasp/hold prey and to climb and crawl along the seafloor
  - Chromatophores – specialized pigment cells that expand and contract to change color or pattern
  - Most discharge some sort of _____ to confuse predators
  - Highly developed brain and eyes.
  - All species are _____
- Octopus
  - _____ tentacles lined with suction discs
  - Powerful parrot like beak – sometimes armed with venom
  - Blue blood!! Hemocyanin – O_2 carrier in blood
  - _____ hearts to keep blood pressure high to deal with low oxygen levels
  - Lifespan is only 3 – 5 years
  - Chromatophores
  - No shell
  - Ink!

- Squid
  - _____ tentacles (8 “arms”, 2 longer “tentacles”)
  - Reduce internal shell called a “pen”
  - Beak-like mouth
  - Chromatophores
  - Blue blood – also has _____ like octopus
  - Life span 1-2 years



- Vampire Squid
  - *Vampyroteuthis infernalis*, literally translates as “vampire squid from hell”
- The Colossal Squid
  - Largest invertebrate – up to _____ feet long!
  - Suction cups have large swiveling hooks
  - Largest eyes – _____ inches in diameter!

- Cuttlefish
  - Internal shell called the _____
  - 8 arms, 2 longer tentacles
  - Many people keep cuttlefish as pets
  - Strange eyes - “W-shaped” pupils

- Chambered Nautilus
  - 90 tentacles – no suckers
  - Eyes not as advanced
  - As the animal matures, it moves _____ and cuts off each chamber
  - Siphuncle penetrates each chamber and functions in buoyancy control – pumps water into and out of chambers

Class Scaphopoda

- The tusk shells
  - Means “shovel-footed”
  - Shell is tube-like and _____ on both ends
  - Foot used to dig in sand and eat detritus

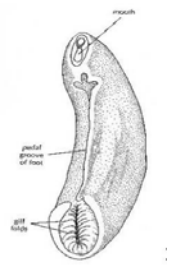
Class Polyplacophora

- “Many plates”
- AKA Chitons
- _____ overlapping shells
- No eyes or tentacles
- Inhabit rocky intertidal zones
- As it moves, it feeds (like a snail) by scraping algae off rocks using its _____

Class Monoplacophora

- “One plate”
- Only _____ living species
- Possess single cap-like shell
- Most live at great depths
- Segmented like worms – so may be more closely related to segmented worms than molluscs

Class Aplacophora



- Without a shell
- Worm like
- About 100 species
- Most live at great depths
- No real means of locomotion
- Reduced foot – only pedal _____