Phylum	Porifera	Cnidaria	Mollusca	Annelida	Chordate	Amphibian
Body plan	asymetrical; no top,bottom, left or right; body forms wall around large central cavity; Choanocytes move water through sponge; harad sponges spine made of spiny spicules; soft sponges have internal spine made of spongin;	radially symmetrical, central mouth surrounded by tentacles; 2 stage life cycle, a polyp, a medusa; Polyp-mouth on top, arm like tentacles, sessile; Medusa-Body wall surrounds internal space where digestion occurs,	The body plan of most mollusks has four parts; foot, mantle, shell and visceral mass. The foot takes many forms (tentacles, spade-shaped, flat structures) and can be used for capturing prey, burrowing, or crawling. The mantle is a thin layer of tissue that covers the mollusk's' body. The shell is made by glands and is composed of calcium carbonate. Under the mantle is the visceral mass which	segmented bodies, bilateral symmetry,	bilateral symmetry, central mouth, swim bladder helps them float/sink, full digestive system, closed circulatory system, well developed nervous system; rid their body of nitrogens by ammonia	They have a mouth and anus. They are bilaterally symmetrical. Before metamorphosis they have fins. vertebrate(means it has backbone)

			consists of internal organs.			
Feeding	What they eat: Plankton which they filter from the water in the. They collect their food using a cell called choanocytes, then the food gets moved to there other cells using amoebocytes.	Cnidaria first paralyze their prey. They pull their prey into their mouth and then into their gastrovascular cavity.The food enter their wastes and exit there on opening.	Mollusks can be herbivores, carnivores, filter feeders, detritivores, or parasites. Snails and slugs use the radula to feed. The herbivorous mollusks use the radula to eat algae off of rocks or soft tissues of plants. Carnivorous mollusks use their radula to get tear through the structures of other organisms. Octopi use their jaws to eat prey (some also use poisons to capture prey). Clams, oysters, and	range from filter feeders to predators, get food using pharynx, pharynx contains two or more sharp jaws, vegetarian pharynx covered in sticky mucus, filter feed by pumping water through burrow, holds nutrients in gizzard.	they are herbivores, carnivores, parasites, filter feeders, and detritus feeders. food passes through esophagus to the stomach, for some fish it then more processed in pouches called pyloric, from there more chemicals might be added through the intestine and then out the anus.	Tadpoles are filter feeder or herbivores, Eat constantly, Once hit adulthood become strict meat eaters, eat pretty much anything they can catch. Food goes down esophagus, than in stomach, then in intestines, and finally out the cloaca.

			scallops use feathery gills to filter feed. Food enters through the siphon (a tubelike structure that allows water to enter and leave the body), over the gills, then leaves through the excurrent siphon.			
Respiration Circulation Excretion	sponges rely on water flow through body to survive; oxygen removed from water and waste put in;	digestion/ nutrients transported through body by diffusion;	Marine mollusks usually breathe using gills within their mantle cavities. Water passes through the cavity, O_2 and CO_2 diffuse over the gills. Land snails and slugs respire using a large mantle cavity lined with blood vessels.	**Respiration:** Marine annelids typically breathe through gills. Land-dwelling annelids take in oxygen and release carbon dioxide through their skin. These annelids secrete a thin coating of mucus to keep their	**Respiration:** Most fishes respire using gills located on the sides of the pharynx. The gills are made up of structures called filaments. The filaments contain networks of capillaries that provide a large surface	**Respiration:** Gas exchange occurs through the skin and gills. Lungs usually replace the gills when the amphibian becomes an adult. Lungless salamanders exchange gases through the thin lining of the mouth cavity or skin.

			The mantle must be moist for O2 to diffuse over it. **Circulation:** Oxygen and nutrients are carried through the bodies of mollusks via a circulatory system, which may be open or closed. In the open systems, blood is pumped through vessels by a simple heart. The blood will travel through the different sinuses of the mollusk. The blood then flows to the gills where O2 and CO2 are exchanged. The blood then flows back to the heart. This system is	skin moist. **Circulation:** Annelids mostly have closed circulatory systems. In these systems, blood is contained in blood vessels. In earthworms, the blood flows in two major vessels that run from head to tail. Blood in the dorsal vessel travels to the head, and blood in the ventral vessel travels to the tail. Throughout the body, ring vessels connect the dorsal and ventral vessels as well as supply the internal organs with blood.	area for the exchange of O2 and CO2. They do this by pulling water in through their mouths, pumping it over their gills, and then pushing the oxygen-deficient water out through openings in the pharynx. Some fishes have several gill openings, though most have a single gill opening on each side of the body. The water is pumped out through these openings, which are protected by a bony cover called the operculum.	**Circulation:** Circulation system is known as a double loop. First loop takes oxygen poor blood from heart to the lungs, and second loop takes oxygen rich blood from the heart to the rest of the body. The amphibian heart has 3 chambers: a left atrium, right atrium, and ventricle. Blood pumps throughout these chambers and circulates the body. Most oxygen poor blood goes to the lungs, and most oxygen rich blood goes to the rest of the

			better for slow-moving mollusks, but closed systems work better for mollusks with faster-moving bodies. **Excretion:** Cells of the body release waste into the blood in the form of ammonia. Nephridia remove the ammonia and release it outside the body.	The dorsal vessel acts as a heart in that it constantly contracts and pumps the blood. **Excretion:** Annelids produce two kinds of waste, digestive and cellular waste. Digestive waste is released through the anus. Cellular waste is eliminated by nephridia (excretory organs that filter fluid in the coelom).	Many fishes have adapted to live in oxygen-poor water. These fishes have specialized organs that serve as lungs. In these fishes, a tube bring O2 from the air to the organs through the mouth. **Circulation:** Fishes have closed circulatory systems and have a heart that pumps blood around in a single loop (heart to gills, gills to rest of body, body to heart). The heart of fishes consists of four parts: the sinus venosus, atrium, ventricle,	body. Sometimes the bloods mix. **Excretion:** Amphibians are able to filter waste out of there blood using well developed kidneys. These kidneys turn the waste into urine which then travels out of the body through the tubes known as ureters and then into the cloaca. The urine can be temporarily stored in a small bladder but it's usually exits straight out after going through the cloaca.

					and bulbus arteriosus. **Excretion:** Most fishes excrete nitrogenous waste in the form of ammonia. Some wastes diffuse through the gills. Other wastes are removed by kidneys.	
Response	No nervous system; releases toxins/poison when potential predator around	gathers information using sensory cells; has a nerve net allows them to notice foreign touch; have eyespots to detect light;	Mollusks greatly vary in ability to respond to environmental conditions. Most two shelled mollusks are on the lower to almost no activity usually burrowing in sand or mud. There nervous system is very simple and consists of small ganglia near their	has brain and several nerve cords, these best develop in free living marine annelids, has sensory tentacles, chemical receptors, statocyst that help detect gravity and two or more pairs of eyes.	Fishes have a well developed nervous system organized around the brain. The olfactory bulbs then give fishes a sense of smell. the cerebrum is responsible for all voluntary activities of the body, the cerebellum coordinates body movement, medulla oblongata	Very similar nervous system to the fish, they have large eyes that can move around and can see underwater and on land, has tympanic membranes (eardrums) to hear.

			mouth. On the other side of the spectrum is octopi who have a extremely intelligent nervous system and live an active life.		controls internal organs.has developed eyes and nose.	
Reproduction	Sponges release a fertilized larva which floats around for a couple days, then it attaches to a solid on which it grows into a matured sponge.	Cnidarians are able to reproduce both sexally and asextually. Polyps are also able to asextually reproduce by budding. One way for budding is when the side of a Polyp swells into a new polyp or they can release tiny medusas that separate into new polyps.	Mollusks have the ability to reproduce in several ways. Some tow she'll mollusks reproduce using external fertilization this process is sexual. They release a lot of eggs and sperm into the water. They developed in the water into larvae. While other mollusks with tentacles develops	Annelids usually reproduce sexually. Some annelids are hermaphrodites such as earthworms and leeches who produce both the sperm and eggs. Other annelids use external fertilization to fertilize their eggs and then mix it in the water with sperm. Annelids also have separate sexes.	eggs can be fertilized externally or internally depending on species; oviparous hatch outside mother’s body, ovoviviparous stay inside the mother’s body after fertilization; viviparous stay inside mother’s body and are born alive (not an egg)	Amphibians reproduce sexually. They reproduce by the male climbing onto the female's back and squeeze, which releases a response in the female. Due to this stimulus the female releases up to 200 eggs which then gets fertilized by the male. The male incases the eggs in a transparen

			the larvae and fertilize the egg inside the female body. Other mollusks are hermaphroditic, having the male and female reproductive organ which makes it possible for them to reproduce asexually.			t jelly. This jelly attaches the eggs to under water plants and are kept there using the stick of it. The eggs can stay there and develop into embryos due to how hard it is for predators to pull the eggs out of the jelly. Finally the embryos hatch into larvae called tadpoles and then develop into frogs.
Germ Layers	does not have germ layers	two germ layers	Three germ layers	three germ layers	three germ layers	Three germ layers
Cephalization	does not have cephalization so can't feel anything	no cephalization	Present in mollusks	present	present	present
Coelom	does not have a	no coelom	true coelom	true coelom	true coelom	true coelom

	coelom					
Early Development	Sponges start as a larva and then it sticks to a solid and grows.	They start as tiny medusas or fertile eggs and grow from there into adults.	Protostome	Protostome	odd-looking, jawless, armored with bony plates; first vertebrates	goes from egg, to tadpole, then to young frog.