

Explain what limits cell size and why, and explain why neurons can be a meter or more in length - just remember the salt analogy

- cells are limited in their surface to volume ratio because molecules have to be able to find their way into and out of the cytoplasm and through the membrane easily
- neurons can be very long that must travel from the brain and innervate muscles in the foot must be long - the neuron attempts to max its surface volume by this unconventional shape and they are thus able to perform chemical reactions more quickly because of increase in surface area - **think of salt dissolving more quickly as a fine powder** than chunks or rocks - **another ex is the lung that increases surface area** in order to maximize the diffusion of oxygen. nerve cells get around this by being very long and thin - microvilli of the small intestine increase absorption to maximize surface area to volume ratio

List and explain the six major characteristics of life.

- **adapt and evolve in environment over time** - in order to survive living things must adapt to their advantage
- **homeostasis** - stable interior environment
- **organized structure** (ie organelles) - division of labor - must have cells
- **reproduce and grow** - using the information present in DNA - get bigger and change
- **respond and communicate with their surroundings** - body responds to the external environment - when it is hot a person sweats - cold shiver
- **metabolism to sustain** - metabolism are the life-sustaining processes that make energy and synthesis of molecules needed by the body

REMEMBER ALL 6

H A M O R (S)

Explain the function of organelles in general - MOBY - MOBY DICK - ORGANS

- specialized subunits - each has own function - coated with lipid bilayer
- The name comes from the comparison of bodily organs to an organism by german scientist Mobius (1884) from diminutive of latin organum
- Each organelle in the cell represents a specialized structure for carrying out the basic tasks of the cell
- Ribosomes make proteins.
- Golgis help to package the proteins.
- Mitochondria are the energy maker of the cell because they make the ATP through the process of glycolysis.
- ER are tubular passage for storage and transport ribosomes
- The nucleus for eukaryotes houses all the cell's basic information about reproduction and metabolism, growth, and protein synthesizing
- Each organelle has a distinct shape and geometry that reflects it's specialized function

Compare and contrast covalent, ionic, and hydrogen bonds, and van der Waals interactions and Explain how these bonds influence inter- and intramolecular interactions.

- Covalent bonds are usually the non-polar carbon to carbon and hydrogen bonds. They are the primary and equal sharing bond of two atoms of organic material mainly hydrocarbons.