

Chapter 1, 21, 22, 23 9/9/14

- Chapter 1
 - Characteristics of living organisms
 - Ability to reproduce
 - Unicellular or multicellular
 - Maintain homeostasis
 - Contain genetic information
 - Genetically related and have the capacity to evolve
 - Metabolism
 - Can harness energy from the environment
 - Complex
 - *Change in response to environment*
 - Life comes from life experiments
 - Spontaneous generation does not occur
 - *Multi-cellular world*
 - Plasma membrane
 - Phospholipid bilayer
 - Hydrophilic and hydrophobic
 - Hydrophilic are the heads and hydrophobic are the tails
 - *Hydrophobic does not interact with water*
 - *Hydrophilic will interact with water*
 - Selectively permeable
 - Allows for some ions to pass through and others not to
 - *Defines the cells and spaces between*
 - Viruses
 - Have all the characteristics of cells
 - Cannot harness energy from the environment
- Chapter 21
 - Genotype- genetic makeup (sets of alleles) that make up our visible differences (XX,XY)
 - Phenotype- Physical features which are shown through phenotype (blue eyes)
 - Species- A group that organisms that is capable of interbreeding
 - Mutation
 - Somatic- *not passed onto the next generation, just passed onto other cells (body cells, skin cells, liver cells)*
 - Germ line- *these are passed down to the next generation (egg and sperm)*
 - Hardy Weinberg conditions
 - No mutation
 - No migration
 - Large population size- *to prevent sampling errors*
 - Mate at random
 - No differences in the survival or reproductive success of individuals

- o Sexual selection
 - Positive- increases the probability of mating
 - Negative- ability to be spotted by predators
- Chapter 22
 - o Species- the ability or inability of a population to produce fertile offspring
 - o Speciation- the process of creating a new species
 - o Biological species concept
 - Groups that are actually or potentially isolated from other groups
 - *Not always practical*
 - *To test you would need to breed these organisms (some organisms take weeks to years to breed)*
 - *Limitations= Ring species, extinct organisms, asexual*
 - o Ecological species concept
 - Species that are categorized by their niche
 - *Impossible for two species to coexist in the same locations if their niches are too similar*
 - o Evolutionary species
 - Members of the same species share a common ancestor and a similar fate
 - o Morphospecies concept
 - Stating that members of the species look identical
 - *This is more practical but not perfect*
 - *Male and female birds look different*
 - o Reproductive isolation
 - Pre- can't mate at all
 - Behavioral
 - Temporal
 - Spatial
 - Physical
 - Post- offspring are infertile (*genetically incompatible*)
 - Mule - horse and donkey
 - o *Cannot give rise to new offspring*
 - o Allopatric speciation
 - Separation of populations by a physical barrier
 - *Subspecies may form*
 - o Co-Speciation
 - Two groups of organisms speciate in response to each other and at the same time
 - *Parasites and gophers*
 - o Sympatric
 - No physical barrier, something changes ecologically
 - Different shape of beaks (*new foods, seed sizes*)

- o Instantaneous
 - Offspring are isolated from parents
- Chapter 23
 - o Phylogeny- evolutionary history of a group of organisms
 - o Node- last common ancestor shared between species
 - o Sister groups- two species that share the same common ancestor
 - o Monophyletic- single ancestor and all of its descendants
 - o Paraphyletic- A common ancestor with some but not all descendants
 - o Polyphyletic- No common ancestor is shared
 - o Homologous- Something that evolved from a common ancestor and is passed on
 - o Analogous- Cannot be seen in the common ancestor and evolves independently
 - o Synapomorphy- shared by some but not all, seen in the descendants but not in the common ancestor
 - o Radioactive dating- Using isotopes of carbon to get a more precise date (*amount of Carbon isotope can determine age*)

Jeopardy Review Questions

What is the difference between homologous and analogous traits?

What type of DNA was used to support the OUT-OF-AFRICA THEORY?

How many years ago did humans separate from chimpanzees?

What is ecology?

Define reproductive isolation?

What is the difference between somatic and germ cell mutation?

How are organisms classified?

What are the levels of classification?

What is the importance of the FOXP2 gene?

What are the distinct features we humans have acquired since the split from the chimpanzees?

How are new alleles created?

What are the 2 laws to thermodynamics?

How does the morphospecies concept define a species? What are the limitations?

What is metabolism?

Are viruses living? Why or why not?