

Review for Midterm 3

- Adaptive radiation – burst of species from a single lineage (genetic divergence)
- Allopatric speciation – geographical isolation caused by **physical barriers**
- Parapatric speciation – no barrier exists, but a **buffer zone of hybrids** exists
- Sympatric speciation – **both species** reside within the **same geographical region**
- Pre-zygotic isolation
 - Temporal isolation – reproduction occurring at different times (seasonal) (spring/summer mating)
 - Behavioral isolation – courtship rituals differ from one species to another (frogs croaking/crickets chirping)
 - Mechanical isolation – physically different and pollination or copulation is not possible (big dog/small dog)
 - Ecological isolation – microenvironment requirements differ so they cannot live near enough to interbreed (desert/rainforest mating)
 - Gamete mortality – the gametes cannot survive to cause zygote formation
- Post-zygotic isolation – after fertilization occurs there is a problem that prevents successful production of offspring
- Reproductive isolation – methods by which interspecific mating is prevented
- Species – organisms that can mate and produce fertile offspring
- Lamarck – Theory of acquired traits
 - *Fluida* was the substance housed in our nerves that moved to the area where change was needed and caused the body part to change
- Lyell – Theory of uniformity
 - Darwin read his book just before he left for the voyage on the Beagle
- Malthus – Principle of population
 - He thought that unless the population was controlled that all life would cease
- Darwin – sailed for 5 years on the Beagle (boat Darwin was on)
 - Found great diversity in the world
 - Darwin's finches – each species varied by their beaks and feet
- Wallace – traveled like Darwin, found great diversity, forced Darwin to publish
- Natural selection – difference in survival rates among individuals of a given population that differ from one another in one or more heritable traits
 - populations have the ability to make more offspring under favorable conditions resources are limited and this will restrict unlimited population growth
 - results in a modification of traits within a line of descent
- Artificial selection – selectively breeding
- Fossils – Latin word that means “dug up”/evidence of past life
 - Fossilization is a rare process
 - Most species weren't preserved
- Microevolution – small scale changes in allele frequencies brought about by : mutations, natural selection, gene flow, genetic drift
- Macroevolution – large-scale patterns, trends and rates of change

- Taylor and Wergner – first theorized about a possible different configuration of the earth
- Anatomical structures – show similar function but dissimilar in embryonic origin
- Homologous structures – related by embryonic origin, but different in embryonic origin
- Convergent evolution – two species coming together to form a new one
 - lineages that are not related evolve in similar directions
- Divergent evolution – one species branching off into two different species
 - a change in forms from a common ancestor
- Morphological traits – visible appearance or form of an individual or population
- Physiological traits – functional characteristics of an individual or population
- Gene pool – the total number of genes within a population shared by individuals in a population
- Gene flow – emigration and immigration bring in or move genes to new locations
- Genetic drift – random (chance) change in allele frequencies due to chance
- Bottlenecks – think of a neck of a bottle and everything gets narrowed to a small area
- Founder effect – special kind of a bottleneck where a new population is started in a new location by a few founders
- Inbreeding – breed with relatives
- Phenotype – visual effect on genes (what you see)
- Genotype – actual genes you have which cause the phenotype
- Mutation – a change in the DNA that codes for a particular trait. They cause changes in structure, function or behavior
- Biological fitness – a genetically determined tendency to leave behind more reproducing offspring than do competing individuals (survival of the fittest)
- Directional selection – movement due to natural selection that moves phenotypes in a given population in a certain direction
- Disruptive selection – extremes are favored over intermediate forms (keep extremes and get rid of norms)
- Stabilizing selection – intermediate forms are favored and extremes are selected against (getting rid of the extremes)
- Industrial melanism - -a form of directional selection where light colored moths were selected against due to pollution. The plants that once protected them (light colored trees) were increasingly covered with soot and thus looked dark. Darkly colored moths survived and thrived because they could hide from predators on the dark trees.
- Pesticide resistance – when you destroy some species with a pesticide and the remaining ones survive and are resistant to the pesticides
- Antibiotic resistance – antibiotics killed MOST bacteria, but some bacteria had the ability to live
- Linnaeus – devised the currently accepted naming system for organism (binomial nomenclature)
- Taxonomy – the science of classification/sorting things into categories

- Kingdom, Phylum, Class, Order, Family, Genes, Species (more inclusive → less inclusive)
- Population dispersal
 - Clumped – like humans
 - Uniform – very evenly spaced (desert bushes spread out evenly)
 - Random – no pattern
- Exponential growth follows a J-shaped curve
- Logistical growth – follows an S-shaped curve
- Graph of Population Growth (**see graph**)
 - A – exponential growth region
 - B – population that has exceeded the carrying capacity of the environment
 - C – population that is dying out possibly due to over population
 - D – stable population in equilibrium with the environment
 - E – carrying capacity of the environment
- Doubling Time – time it takes for a population to double
- Density dependent – disease, stress, pollution, parasites
- Density independent – weather, natural disasters, seasonal cycles
- US population – 305 million/4.7% of world population
- India population – 16% of world population
- World population – 6.7 billion
- Pangea – the super continent where everything was connected as one land mass
- Biogeography – the study of the distribution of organisms on Earth and the factors controlling the distribution of animal distribution
 - Physical barriers
 - Climatic barriers
 - Biological barriers – absence of appropriate food, competition from other species, predators or disease
- Survival curves – Type I, II, III