

## Honors Bio Unit 8 Chapter 10 Study Guide

### Darwin's Influences

#### People

<b>James Hutton</b>	Earth is very old; geological change occurs gradually
<b>Charles Lyell</b>	Earth is very old; Earth's changes occurs at constant rate

#### Galapagos Islands

Variation	Adaptations	Fossil & geologic evidence
Differences in physical traits	Features allowing organisms to survive better in environment	Fossilized species changed over time All modern organisms related to the fossils
variations well-suited to environment	finch beaks changed based on food source	Earth very old Organisms change gradually over time

#### Breeding

<b>Artificial selection</b>	Humans change a species by breeding it for certain traits (eg dog breeds)
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### Theory of Natural Selection

<b>Environment is selective agent</b>
organisms better fit to survive in environment reproduce more
more organisms with this trait survive and pass on trait
species gradually changes to become most fit to environment

#### Principles

<b>Variation</b>	Population variations (random differences) are basis for natural selection
<b>Overproduction</b>	Organisms produce more offspring than will survive to create <b>competition</b>
<b>Adaptation</b>	Some adaptations allow organisms to survive at higher rate, so individuals are "naturally selected" to survive and produce more offspring
<b>Descent with modification</b>	over time, organism traits are modified natural selection results in species with adaptations well-suited for survival

#### Important Factors

<b>Fitness</b>	How suited to the environment an organism is and how well it survives Measure of ability to survive and produce more offspring relative to other members of a population (not necessarily physical strength)
<b>Natural selection acts on phenotypes</b>	Not based on structure of genetic material, based on fitness of physical traits As environment changes, different traits become beneficial

### Evidence of Evolution

<b>Fossils</b>	Show gradual change of organisms over time, supporting descent w/ modification
<b>Geography</b>	Finches on islands similar to mainland, but new traits developed on different islands Traits = adaptations in diets, habits, and beak shapes to become fit to environment
<b>Embryology</b>	Similarities in embryos shows relationships btwn organisms and common ancestor
<b>Anatomy</b>	Comparing body parts of different species (see <u>Anatomical Structures</u> )
<b>Molecular &amp; genetic evidence</b>	<b>DNA sequence analysis:</b> closely related organisms have more similar DNA <b>Pseudogenes:</b> genes no longer function, organisms similarities suggest common ancestor <b>Protein comparisons:</b> similarities in proteins = common ancestor

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### Anatomical Structures (see Anatomy)

<b>homologous structures</b>	<b>analogous structures</b>	<b>vestigial structures</b>
similar structure, different functions	similar function, different origin	structures/organs often reduced in size that seem to lack any useful function
Suggest common ancestor	evolved independently	Had function in early ancestor
eg human legs and whale fins have similar structure	possibly different structure: eg bat and insect wings	Eg appendix, ostrich wings, muscles to move ears, remains of front legs on whales, goosebumps

## Labs

### Peppered Moths

<b>Insularia</b>	Moths w/ more dark spots than average moth
<b>Industrial revolution</b>	Time period when factories built that ran on burning coal for fuel
<b>Industrial melanism</b>	moths darkened in a short time to blend with polluted forests
<b>What caused different moth colors?</b>	Random genetic mutations in a single moth's DNA that lived longer to reproduce and pass DNA to its offspring
<b>Why did dark moths have a survival advantage?</b>	Blended in with dark, polluted forests, so made it harder for predators to spot and eat them