**Name;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Assign:\_\_\_**

**Possible Modes of Natural Selection**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ leads to differences in selection
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ favors the extremes over intermediates
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shifts variation toward one extreme
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ leads to reduced variation/uniformity, selects against extremes



**Evidence of Evolution**

**Fossil Record**

* Fossils are more than just bones
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Fossils become more complex over time
* Age determined by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has a half life of 5,730 years, other isotopes used also
	+ Earth = \_\_\_\_years old Oldest fossils = \_\_\_\_\_\_years old

**Fossil Record Continued**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
	+ Skeletons showing animals that are similar but change over time and can be dated using carbon dating
	+ Examples include
		- \_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Patterns**

* If species have changed over time then their \_\_\_\_\_\_\_\_\_\_\_\_ should have changed too
* Thus more closely related species share more similar \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ patterns
	+ E.g. 1 protein in humans in chimps is identical in all 104 amino acids. Dogs share 91/104, and rattlesnakes 84/104

**Evidence of Natural Selection**

* Many species and many locations where this can be seen
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ experiment by Kettlewell
		- Recreated London smog/soot effect on moth coloration.
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- HH = \_\_\_\_\_\_\_\_\_\_\_, Hh = \_\_\_\_\_\_\_\_\_\_ but low blood oxygenation, hh = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- 1/100 people have hh in central Africa
		- 1/500 African Americans have hh in the U.S.
		- Hh = Reduced risk of \_\_\_\_\_\_\_\_\_\_\_\_ but can pass disease onto children
		- In the US there is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ selection against sickle cell
		- In Africa there is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ selection

**Species Formation**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are populations of same species that differ slightly genetically to adapt to their conditions.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is increase in these differences over time
	+ Long buildup of differences can generate new species
	+ Humans races are Extremely closely related.