**EVOLUTION INTRO NOTES Name:**

Evolution is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change in the heritable characteristics of a \_\_\_\_\_\_\_\_\_\_\_.

Darwinian Evolution is not simply based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ selection but was in fact a composition of at least five different 'sub theories':

**1. Evolution**: that all life is and has been perpetually \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This contrasts strongly with notions that all forms of life are constant an unchanging.

**2. Common descent**: that all living things share a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ancestor if the traced back far enough.

**3. Gradualism:** that evolutionary change takes places \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This contrasts with saltation in which changes are sudden and extreme.

**4. Multiplication of species:** the diversity of life is a consequence of speciation. Populations \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to locations and becoming reproductively \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from other populations.

**5. Natural selection**: a two stage process in which there is:

* + 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Outline the evidence for evolution provided by the fossil record, selective breeding of domesticated animals and homologous structures**

1. Fossil: A fossil is the ancient preserved remains of an organism. The fossil can be dated from the age of the \_\_\_\_\_\_\_\_\_\_\_\_ formation. Sequences of fossil can show the gradual change of an organism over geological time. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fossil records are rare with most containing large time gaps until subsequent discoveries are made.
2. Homologous: All of life is connected through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ history and consequently those organisms more closely connected might reasonably be expected to share common structures or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Group of organisms closely related share a common form or **derived trait** which has been inherited from the common ancestor.

In homologous structures it is normal to find that parts of the structure will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, enlarged or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (vestigial).

**Divergence**: The pentadactyl limb structure shows adaptation and modification from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ limb (ancestor) structure.

**Convergence**: Two organisms with different ancestors have a limb structure that fulfills the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function but has evolved from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ origins.

Example: Wing of a bird and the wing of an insect.

a) Humerus

b) Radius

c) Ulna

In each example the bones are modified and adapted to the locomotion of the animal.



**Selective breeding:** man has selectively breed animals and plants for thousands of years. If an animal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a characteristic that is considered useful or valuable then this animal is selected for breeding. The hope then is that this characteristic will be present in the next generation and at a higher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than before. In subsequent generations it may even then be possible to select from an even more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ characteristic.

A Thought experiment: Selection of high milk yields in cows.