**Charles Darwin &
the Theory of Natural Selection**

In his book \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Charles Darwin introduced the concept of natural selection.

**natural selection…**
is nature’s process which acts to \_\_\_\_\_\_\_\_\_\_\_\_\_ (save) and keep any \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a species may have.

* ****suppose a member of a species were born with
an advantage.
* e.g. a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ would have an obvious advantage over other reptiles related to it.
* they would have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and therefore are more likely also to be around to reproduce, allowing for the trait to possibly continue on.
* **natural selection** would act to preserve this \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is helpful (wings).
* the species that have that trait will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and pass it on to their offspring and so on.
* so basically… natural selection is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equivalent of **selective** or **domestic breeding**.
* the difference between domestic breeding and natural selection is, **nature** itself is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will be most helpful.

**Domestic Animal Breeding**

Over centuries, breeders have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in domestic animal populations by selecting specific dogs to breed. They have been able to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (given the trait is already present in the genetic code) and suppress undesired traits over time.

* E.g. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_make great guide dogs as they are very intelligent but they also shed a lot, which makes it hard for owners with allergies, when mixed with poodles (shorter hair breed), they produce a new dog breed, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This mix of breeds is highly intelligent, given that both poodles and labs are ranked in the top 10 of all dogs.

* **Survival of the fittest… natural** **selection** essentially states that the strongest of a species survive.

the basic idea is that when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, those which are best suited to the new circumstances or environment will thrive. Those who are not ideally suited will not be able to compete.

**Sexual selection** also occurs, through \_\_\_\_\_\_\_\_\_ selection, so desired traits can be retained over others less desired.

**Charles Darwin** proposed this principle after observing some population variations in birds.

* He noticed that animals within a species often had \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and that those traits made some more suited to certain conditions.
* Darwin's theory was that, over time, the better suited animals would thrive and the others \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ completely. The resulting population would be entirely made up of those animals with the "better" trait.

**Darwin** visits the Galapagos Islands.

* the islands are ­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from each other and have different environmental factors.
* Darwin observed that some varieties of animals or birds lived on some islands and not others.
* He began to collect and record data on the different species that he found in the islands.
* Variations within a single species make some members better suited to handle different circumstances.
* e.g. the birds had differently shaped beaks which would allow them to eat from certain plants and trees more or less easily.
* The moths that lived in cities in England around the time of the **industrial revolution** had to deal
with increased **pollution**.
* **Lighter-colored moths ­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on soot-stained buildings and trees, and thus… were easier targets for birds.
* The **darker moths** found it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, because they blended into the darkened environment. As a result, the population of light-colored moths lessened over time, and the darker-colored moths increased.
* The dominance of the ­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is used as an example of **natural** **selection.**

But…
how did the species actually pass on their traits to their offspring?

Darwin couldn’t explain this…

* enter Gregor Mendel