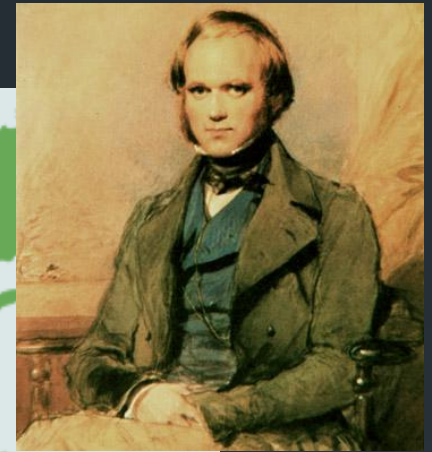




EVOLUTION & DARWIN'S THEORY OF NATURAL SELECTION

Darwin's Theory of Natural Selection

- In 1831, the 22 year old Charles Darwin sailed from England on a five-year voyage around the world
- He served as the ship's naturalist (studied the environment).



Darwin's Theory

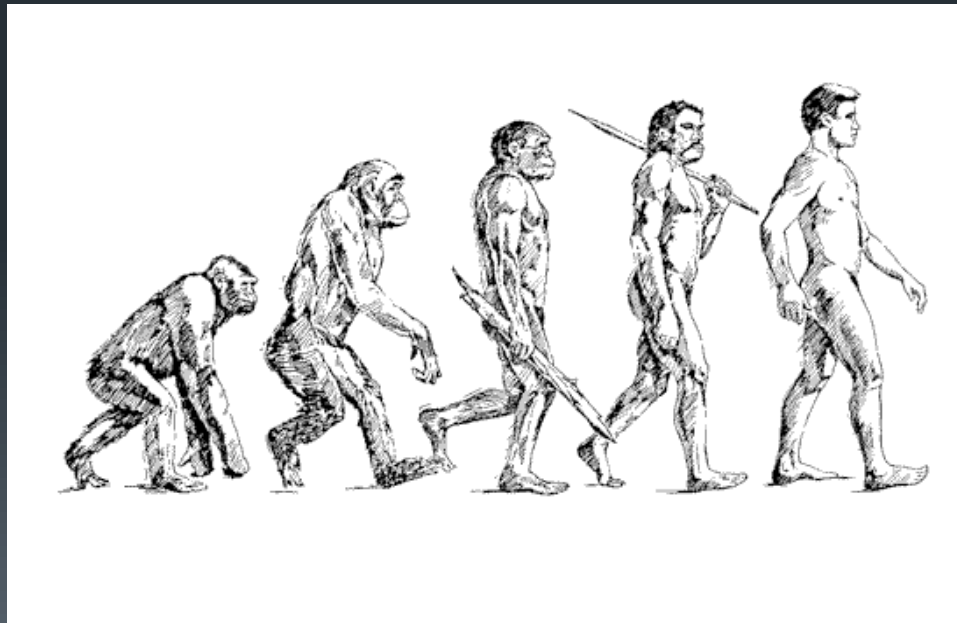
- Years before Darwin, farmers and breeders allowed only the plants and animals with *wanted* characteristics to reproduce, causing the evolution of farm stock.
- Darwin thought that a similar process might occur in nature (without the help of humans).

Artificial Selection: when people choose which organisms get to reproduce – wanted traits are chosen to survive.



Darwin's Theory

- Darwin thought that populations slowly changed over many generations to become better adapted (survive better) in the new conditions.
- This is called EVOLUTION (change over time)!



Darwin's Theory

- In 1858, Darwin thought of an explanation for how evolution could occur in nature:

NATURAL SELECTION!

Natural selection: the process by which individuals that are better adapted to live in their environment are more likely to survive and reproduce

Which moth do you think will survive (not get eaten)?



Darwin's Theory

- Some differences in organisms make them better adapted to their environment – this makes them more likely to survive.

Adaptations: traits that are helpful and increase survival.



Cuttlefish has **camouflage** so he can hide from predators. Now he can survive and reproduce!

Darwin's Theory

- Organisms with helpful adaptations survive to reproduce (make babies)
- The babies then will give these helpful traits to THEIR babies.

Darwin believed that the helpful traits would increase over time while the **unhelpful** traits would **disappear!**

- **THIS IS NATURAL SELECTION:** the USEFUL traits are passed on to offspring over the NON USEFUL traits.

Where's lunch (the frog)?

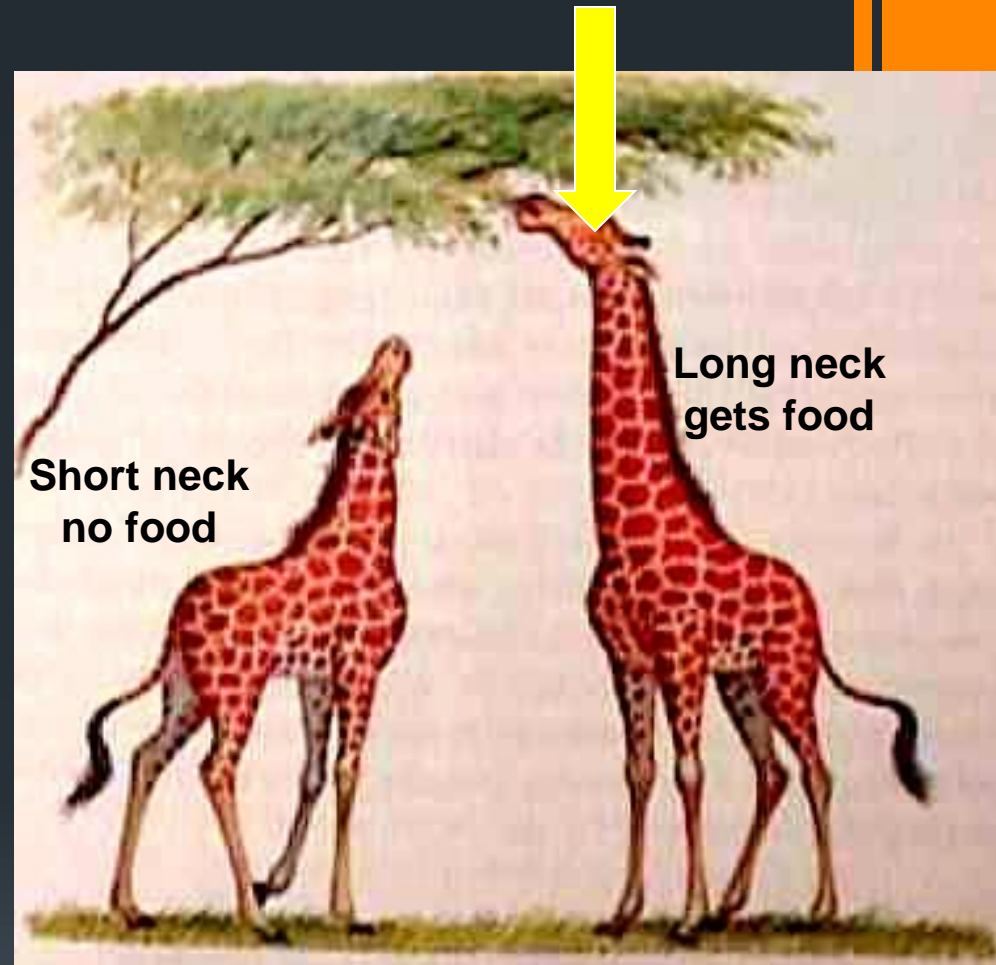


There he is!

- Looking like moss (**camouflage**) helps this frog survive and reproduce, so this trait is **NATURALLY SELECTED** for this environment.
- This frog will give this helpful trait to its babies!

Which giraffe do you think will survive?

- A long time ago, the giraffes with the **short necks** died because they could not reach the tree leaves.
- The **helpful trait** for long necks was **passed down to offspring**, so now giraffes have **long necks** to reach high leaves!
- This is natural selection in action!



Natural Selection

Many green and a few brown beetles lived in this habitat. The predator (bird) liked to eat green beetles.

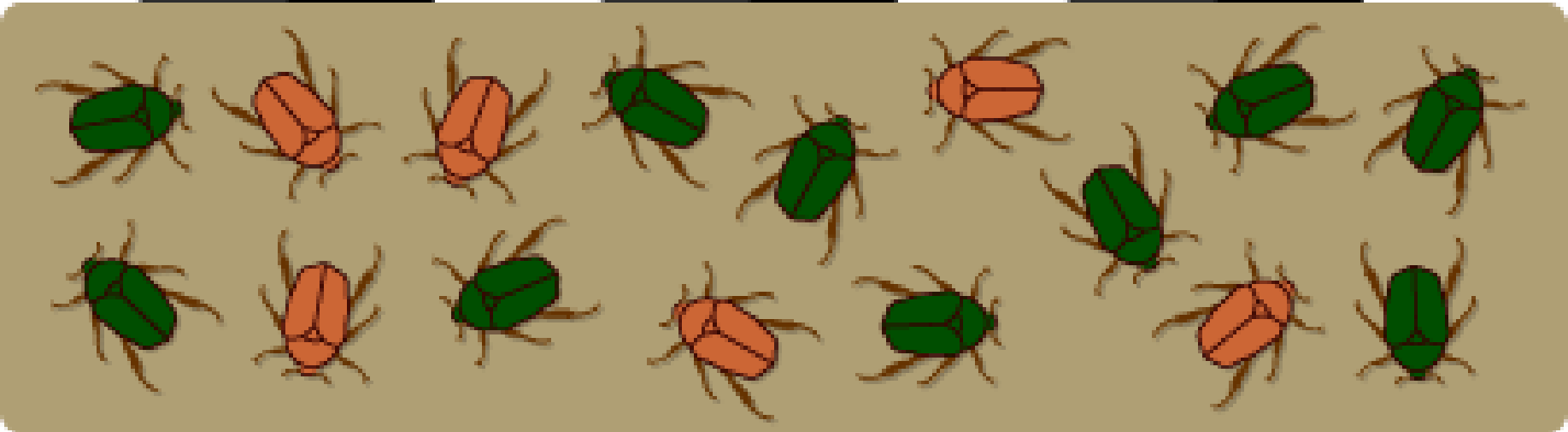
Natural selection, in a nutshell:



Years and years later, the birds kept eating the green beetles. Now there was the same amount of brown and green beetles.

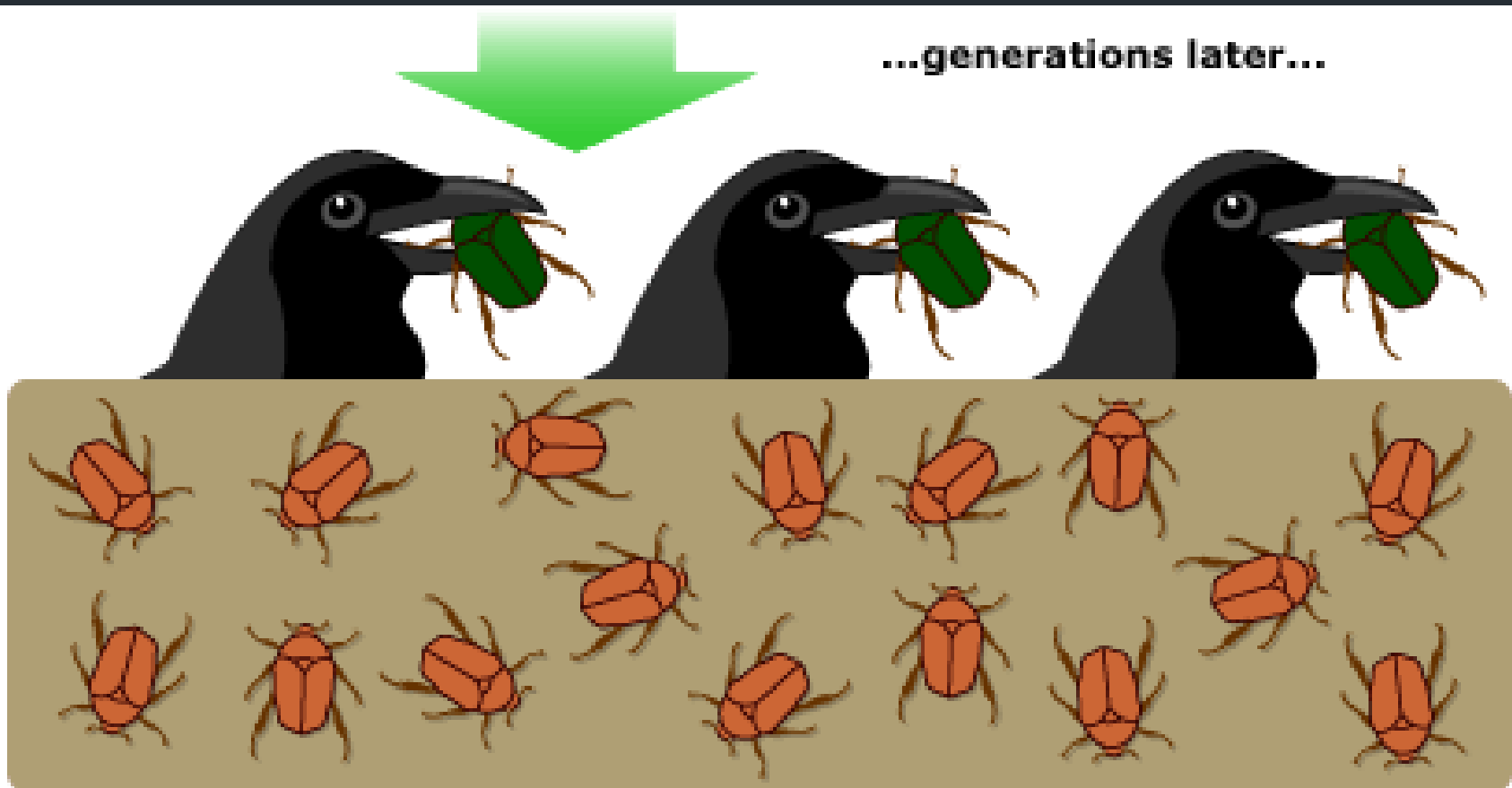


...generations later...



Soon, the brown beetles survived because they did not get eaten!

Natural selection has passed on the brown trait as a **helpful** trait to survive and reproduce.



Green beetles have been selected against, and brown beetles have flourished.

Sexual Selection



- Sexual selection is the ability to attract a mate
- Example:
 - Peacocks: The bigger the tail of male peacock, the more attractive it is to females



Mimicry

- In **mimicry**, one species evolves to look like another species
- Harmless species can *mimic* harmful species, which cause predators to avoid them because they can't tell the difference



Western coral snake



California kingsnake