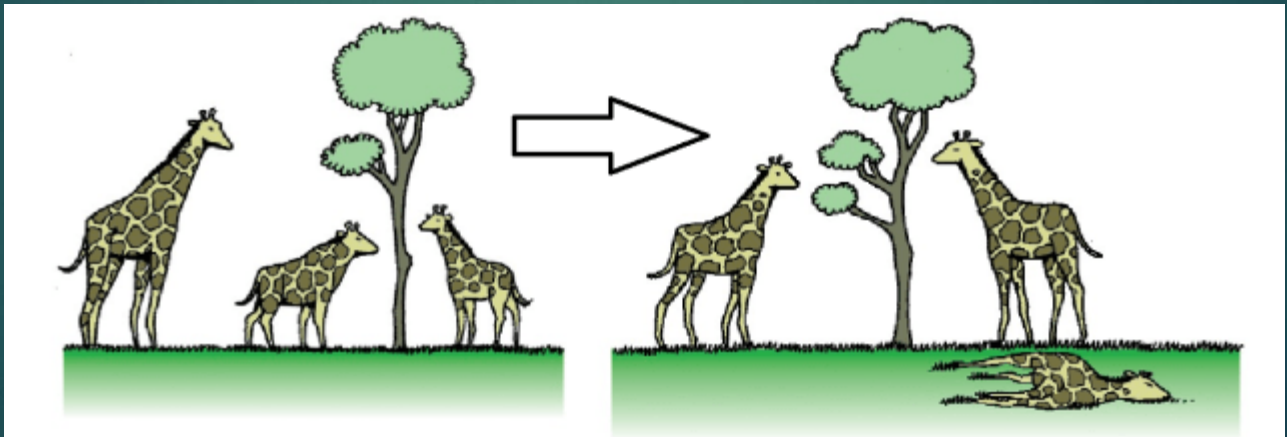
Natural selection favours traits that make an organism better suited to its environment

- Some mutations may provide a selective advantage in changing conditions.
- **Selective advantage:** a genetic advantage that improves an organism's chance of survival, usually in a changing environment

Natural Selection

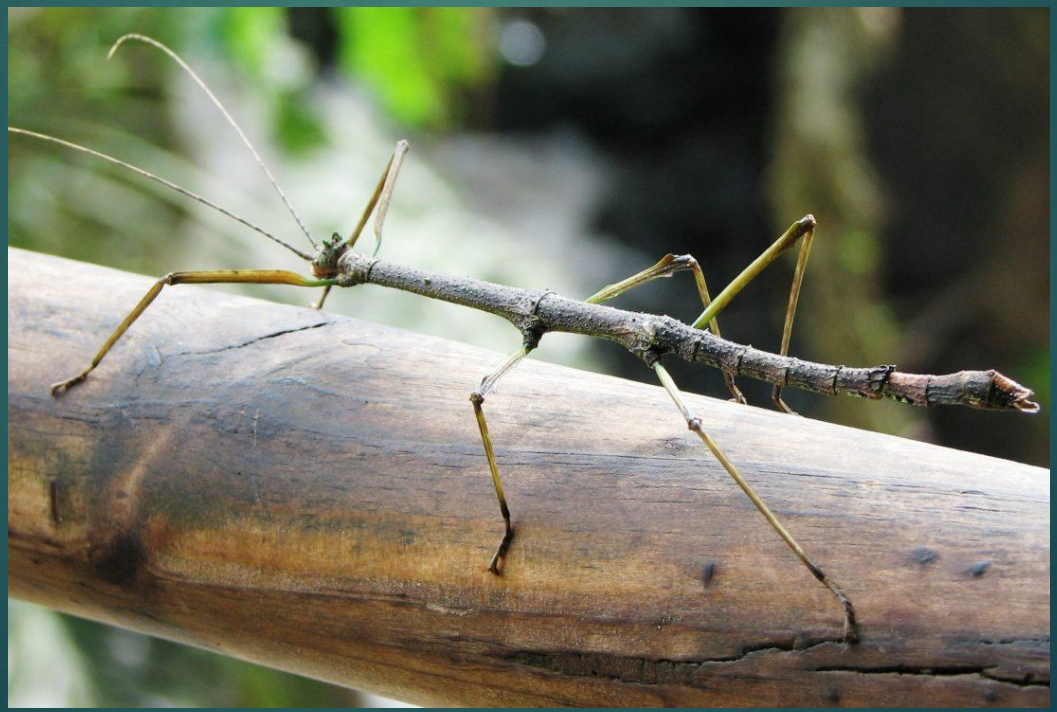
- **Natural selection:** the process by which characteristics of a population change over many generations as organisms with heritable traits survive and reproduce, passing their traits to offspring
- There must be genetic variation within a species for natural selection to occur.



Natural Selection in action

Selective Pressure

- **Adaptation:** structural or behavioural feature or physiological process that improves the organism's chance of surviving in its environment to reproduce
- Organisms that have an advantageous mutation may survive better in a changing environment.



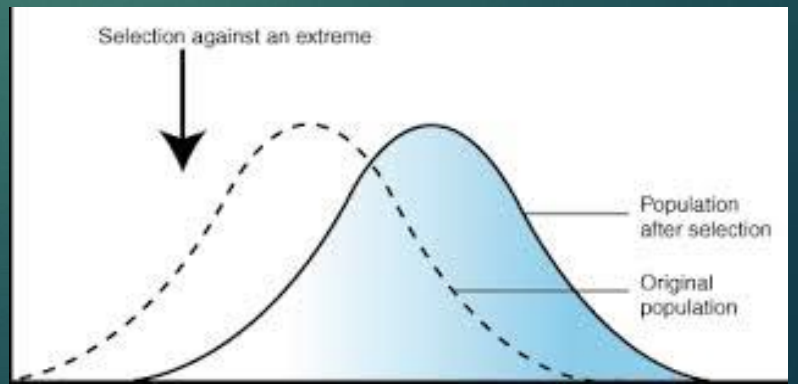
Adaptations and Ecosystems

- Ecosystems are often identified with characteristic biotic factors,
  - such as a cactus in the desert or a caribou on the tundra.
  - Many of these characteristic factors have special adaptations for that ecosystem
    1. Structural adaptation – a physical feature that helps an organism survive
       - A wolf has large paws to help it run in snow.
    2. Physiological adaptation – a physical or chemical event inside the body of an organism that allows it to survive
       - A wolf maintains a constant body temperature.
    3. Behavioural adaptation – a behaviour that helps an organism to survive
       - Wolves hunt in packs to capture large prey.

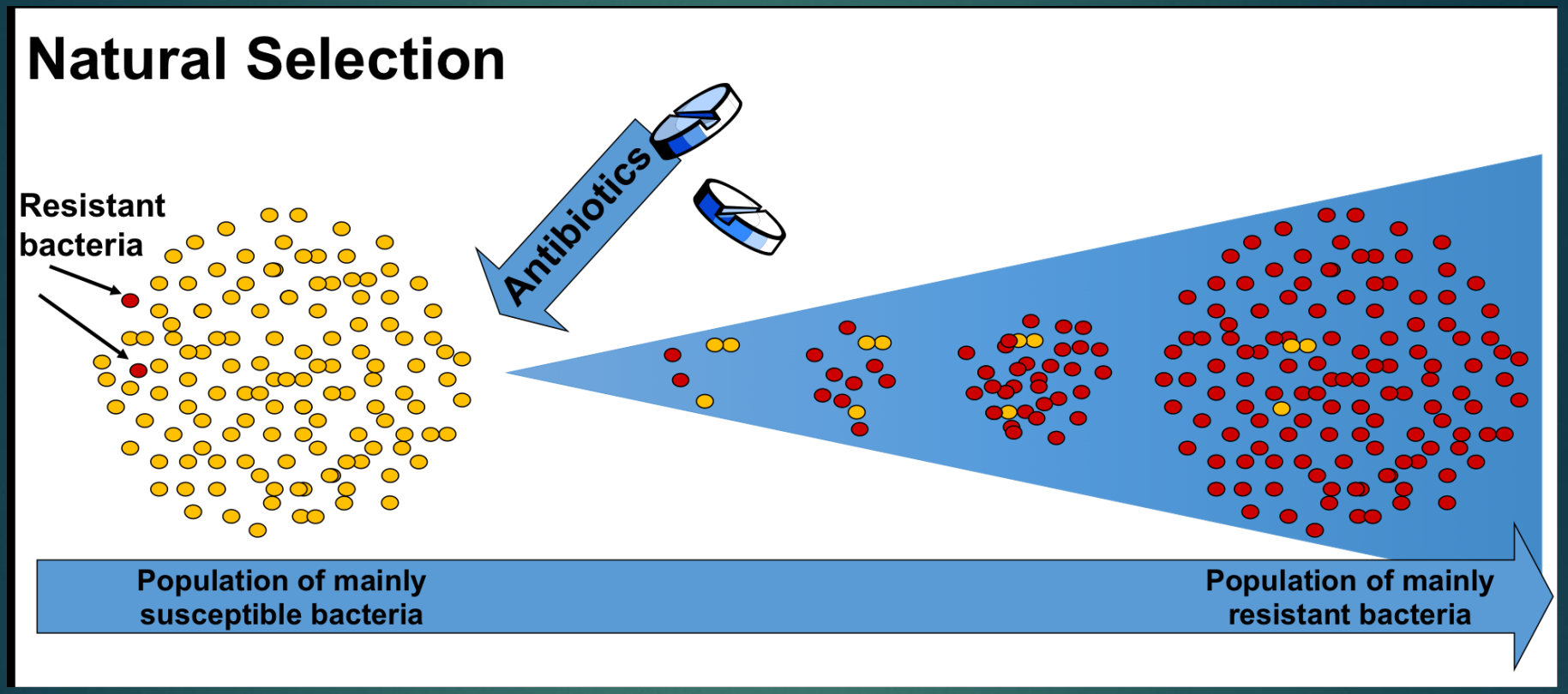
What Adaptation do these organisms have?

Natural Selection Acts on Populations

- An abiotic factor selects for certain characteristics in some individuals and against other characteristics.
- Over time, the ***population*** changes because individuals with favourable characteristics survive and reproduce.
- The environment exerts selective pressures that result from predators, parasites, and competition for limited resources.



Example of Natural Selection



- With a partner, read pg 48 in textbook and write down an explanation this picture.

Natural Selection Is Situational

- Natural selection is situational.
  - It has no will, purpose or direction
- A trait that may be a disadvantage to an individual at one time may be advantageous to its survival later.
- Alleles for this trait will be passed on to the next generation to the offspring

Discussion Questions

1. Why does genetic variation make it possible for changes in populations to occur through natural selection? Explain your answer.

Pg 35-37 in workbook

Biology of Skin Colour