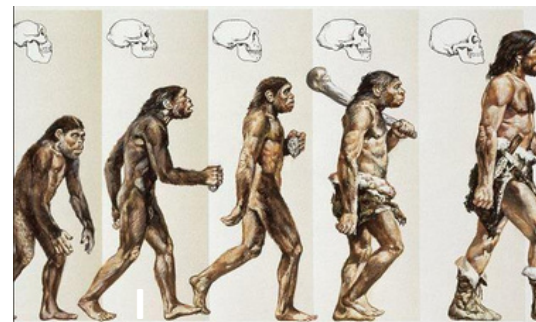


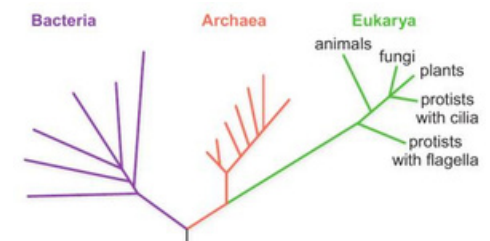
# Knowledge Organiser: Biology, CB4

- 1 **Charles Darwin** published the **theory of evolution by natural selection** in 1859
- 2 This theory states that **individual organisms within a particular species show a wide range of variation for a characteristic. Individuals most suited to the environment are more likely to breed successfully. Characteristics which help individuals to survive and are then passed on to the next generation**
- 3 The theory was **slowly accepted** as it challenged the theory of creation and there was insufficient evidence at the time
- 4 **Evidence** for human evolution comes from **fossils and stone tools**
- 5 Fossils - **Ardipithecus ramidus (Ardi)** from 4.4 million years ago  
**Australopithecus afarensis (Lucy)** from 3.2 million years ago,  
Leakey's discovery of **Homo habilis** from 1.6 million years ago
- 6 **Stone tools** from different ages have been found in layers of **rock**.  
The **age** of different layers of rock can be dated.
- 7 Evolution is widely accepted. **Evidence** is now available to show that **characteristics** are passed on to offspring in **genes**.
- 8 **Carl Linnaeus** classified living things, there are 5 kingdoms  
**animals, plants, fungi, protista, prokaryotes**  
Linnaeus classification is **Kingdom, Phylum, Class, Order, Family, Genus, Species**
- 9 **Carl Woese** developed a system where there were 3 domains  
based on **genetic analysis**
- 10
- 11 Woese classification has three domains - **Archaea, Bacteria and Eukarya**

- 12 **Selective breeding** is choosing parents with the **desired characteristics** from a mixed population
- 13 Desired characteristics are chosen for **usefulness or appearance** - disease resistance in food crops, animals which produce more meat or milk, domestic dogs with a gentle nature.
- 14 **Genetic engineering** involves the **modification** of the **genome** of an organism to introduce desirable characteristics
- 15 **Cloning** of plant and animal cells or tissue can be used to preserve rare plants or match tissue that is not rejected by the body's immune system



**B** Selective breeding of wild cabbage has produced many vegetables – all varieties of the same species.



**D** the three-domain system of classification