*This is the **Higher Separate** version — includes all Higher Tier content (marked ★) and all Separate Science content.*

Classification groups organisms based on their shared characteristics and evolutionary relationships.

- Linnaean classification system (Carl Linnaeus, 18th century): hierarchical groups from largest to smallest.
- Hierarchy: Kingdom → Phylum → Class → Order → Family → Genus → Species.
- Mnemonic: "King Philip Came Over For Good Spaghetti".
- Binomial nomenclature: each species has a two-part Latin name: Genus species (e.g. Homo sapiens). Always written in italics.
- A species: organisms that can interbreed to produce fertile offspring.
- Modern classification uses DNA evidence rather than just physical similarities — based on evolutionary relationships (phylogenetics).
- ★ **HT** Three-domain system (Carl Woese, 1990): Archaea (primitive bacteria-like), Bacteria, Eukarya. Based on ribosomal RNA sequences.
- ★ **HT** Evolutionary/phylogenetic trees show common ancestors and relationships between species — more closely related species share a more recent common ancestor.
- ★ **HT** Convergent evolution: unrelated species evolve similar features due to similar environments (e.g. dolphin and shark body shape) — can mislead classification based on anatomy alone.

Key Terms

Species	A group of organisms that can interbreed to produce fertile offspring
Binomial nomenclature	Two-part naming system: Genus species (e.g. Homo sapiens)
Taxonomy	The science of classifying organisms into groups based on shared characteristics
Phylogenetics	Classification based on evolutionary relationships and shared ancestry
Three-domain system	Classification based on ribosomal RNA: Archaea, Bacteria, Eukarya

■ **Exam Tip:** Know the order of classification: Kingdom, Phylum, Class, Order, Family, Genus, Species. The species is the most specific level. Two organisms of the same species can interbreed to produce FERTILE offspring.