

This is the **Higher Combined** version — includes Higher Tier content. Some Separate-only details are omitted.

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

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