

## **IB Biology B: Curriculum Guide: Classification of Biodiversity**

### **Essential Ideas:**

- Species are named and classified using an internationally agreed system.
- The ancestry of groups of species can be deduced by comparing their base or amino acid sequences.

### **Understandings:**

- The binomial system of names for species is universal among biologists and has been agreed and developed at a series of congresses.
- When species are discovered they are given scientific names using the binomial system.
- Taxonomists classify species using a hierarchy of taxa.
- All organisms are classified into three domains.
- The principal taxa for classifying eukaryotes are kingdom, phylum, class, order, family, genus and species.
- In a natural classification, the genus and accompanying higher taxa consist of all the species that have evolved from one common ancestral species.
- Taxonomists sometimes reclassify groups of species when new evidence shows that a previous taxon contains species that have evolved from different ancestral species.
- A clade is a group of organisms that have evolved from a common ancestor.
- Evidence for which species are part of a clade can be obtained from the base sequences of a gene or the corresponding amino acid sequence of a protein.
- Traits can be analogous or homologous.
- Cladograms are tree diagrams that show the most probable sequence of divergence in clades.
- Evidence from cladistics has shown that classifications of some groups based on structure did not correspond with the evolutionary origins of a group or species.

### **Applications and skills:**

- Skill: construction of dichotomous keys for use in identifying specimens.
- Application: Cladograms including humans and other primates.
- Skill: Analysis of cladograms to deduce evolutionary relationships.