

# Edexcel (B) Biology A-level

## 3.1 - Classification

### Flashcards

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Define classification.



Define classification.

The process of naming and organising organisms into groups based on their characteristics.



Name the eight groups in the classification hierarchy, from largest to smallest.



Name the eight groups an organism can be classified into, from largest to smallest.

Domain → kingdom → phylum → class  
→ order → family → genus → species



# Define species.



Define species.

A group of organisms that can interbreed to produce fertile offspring.



Give a limitation of this definition of species.





Give a limitation of this definition of species.

Does not account for species that reproduce asexually.



Why can it be difficult to assign organisms to one species?



## Why can it be difficult to assign organisms to one species?

- Species often change both morphologically and genetically over time.
- How 'similar' do two organisms need to be to be classed as the same species?
- Hybrids: classified as new species or not?



# How can we analyse evolutionary relationships genetically?



# How can we analyse evolutionary relationships genetically?

1. Gel electrophoresis
2. DNA sequencing
3. Bioinformatics



# How does gel electrophoresis work?



## How does gel electrophoresis work?

Fluorescent DNA fragments are placed at one end of an agar gel plate. An electric current is applied, causing the DNA fragments to move towards the positively charged end. The resulting pattern of bands represents amino acids and is unique to every individual.



# How does DNA sequencing work?





## How does DNA sequencing work?

DNA is broken into small fragments, terminated at different lengths by fluorescently marked nucleotides, then duplicated using PCR. The fragments undergo gel electrophoresis, with the smallest fragments travelling furthest, meaning we can read the base sequence of the fragment according to distance travelled.



# What is bioinformatics?



# What is bioinformatics?

The use of technology and software to analyse large amounts of biological data. Can compare entire genomes and look for where mutations have caused divergence in the phylogenetic tree.



# How does the scientific community evaluate data?



How does the scientific community evaluate data?

Papers sent out to other experts for peer review to check for validity. If data and conclusion seem reasonable, results are published in scientific journals. May also be presented at conferences.



Why has the five-kingdom model of classification come under scrutiny?



Why has the five-kingdom model of classification come under scrutiny?

Relies heavily on physical observations.  
Since the introduction of DNA sequencing, new models have been developed.



Why is the three-domain model of classification more accepted by the scientific community?





Why is the three-domain model of classification more accepted by the scientific community?

Takes into account research of a particular ribosomal unit. More accurately represents evolutionary relationships than five-kingdom.

