

OCR (B) Biology A-level

3.1.3 - Evolution and classification

Flashcards

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Define species.



Define species.

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



Define classification.



Define classification.

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



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



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

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



How are different types of evidence used
in classification?



How are different types of evidence used in classification?

- Observations e.g. fossils. Organisms grouped based on similar physical characteristics.
- Molecular relationships e.g. DNA similarity. Resulted in the development of new classification categories (e.g. the domains).



How is DNA barcoding used in classification?



How is DNA barcoding used in classification?

- Involves sequencing a short fragment of a certain gene from an unclassified specimen, and comparing it to a library of barcodes from classified specimens.
- In animals, mitochondrial genes are used. In plants, chloroplast genes are used.



What does a phylogenetic tree tell us about the relatedness of hominids and hylobatids?



What does a phylogenetic tree tell us about the relatedness of hominids and hylobatids?

- Hominids = humans, chimpanzees, gorillas, orangutans
- Hylobatidae = gibbons
- Hominids closer together on a phylogenetic tree, meaning they are more closely related to each other than to hylobatidae.



What are the three types of adaptation?
Give examples of each one in humans.



What are the three types of adaptation? Give examples of each one in humans.

- **Anatomical** (changes to body structure) e.g. brain size, walking on two legs.
- **Physiological** (changes to bodily processes) e.g. skin pigmentation, lactose tolerance.
- **Behavioural** (changes to actions) e.g. use of tools, social bonding.



Give adaptations of plants that allow them to live in extreme conditions.



Give adaptations of plants that allow them to live in extreme conditions.

Extremely dry;

- Small/rolled leaves
- Thick waxy cuticle
- Stomata often closed
- Hairs to trap moist air

Extremely wet;

- Little/no roots
- Air sacs for floating
- Very few stomata
- Poorly developed xylem



Why are some scientific questions hard to answer? Give an example.



Why are some scientific questions hard to answer? Give an example.

- Evolution of language.
 - Lack of evidence.
 - Competing theories; mother tongue hypothesis states language evolved for communication between mothers and their offspring, while the gossip hypothesis states language evolved as a means of developing social bonds.



How does a species evolve?



How does a species evolve?

- Members of a species have different characteristics due to natural genetic variation.
- Selection pressures such as predation, disease, and competition favour certain characteristics.
- Organisms with these characteristics are more likely to survive, passing the adaptation onto their offspring. Over time, the species evolves.



What is biodiversity?



What is biodiversity?

The variety of living organisms. It can exist at the genetic level (different genes within a species), species level (different species within a habitat), and ecosystem level (different habitats within an ecosystem).



What is Simpson's Index of Diversity?



What is Simpson's Index of Diversity?

- A measurement of the total number of organisms compared to the total number of organisms of each species.
- A high index of diversity means several different species are equally abundant. A low index means one or two species dominate over others.



How can we calculate genetic diversity within a population?



How can we calculate genetic diversity within a population?

Proportion of polymorphic gene loci = $\frac{\text{number of polymorphic gene loci}}{\text{total number of loci}}$

