Your notes

GCSE Biology: revision notes

Classification and extinction

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The Linnaean system

- Carl Linnaeus classified living things into groups based on their structure and characteristics: kingdom, phylum, class, order, family, **genus** and **species**.
- Organisms are named by the **binomial system**: the **genus** followed by the **species**, for example Homo sapiens.

The three-domain system

- As microscopes improved and scientists understood more biochemistry, new models of **classification** were proposed.
- Carl Woese proposed the **three-domain system**, using chemical analysis.
- **Archaea**: primitive bacteria, usually living in extreme environments. Bacteria: true bacteria. Eukaryota: protists, fungi, plants and animals.

Evolutionary trees

- **Evolutionary trees** show how scientists believe organisms are related.
- They use current **classification** data for living organisms and **fossil** data for extinct ones. Organisms that share a more recent common ancestor are more closely related.

Fossils

- **Fossils** are the remains of organisms from millions of years ago, found in rocks.
- They form from parts that did not decay because some conditions for decay were absent, from parts replaced by minerals as they decayed, or as preserved traces such as footprints, burrows and root traces.

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- Many early life forms were soft-bodied, so they left few traces, and many traces were destroyed by geological activity. This is why scientists cannot be certain how life began.
- **Fossils** show how much or how little organisms have changed as life developed.

Extinction

- A **species** becomes extinct when there are no individuals left.
- Causes include new diseases, new predators, new competitors, changes to the environment over geological time such as climate change, and single catastrophic events such as huge volcanic eruptions or asteroid collisions.

Key terms

Classification	Sorting living things into groups based on their characteristics.
Binomial system	Naming an organism by its genus and species, for example Homo sapiens.
Genus	A group of closely related species.
Species	The smallest group in classification; organisms that can interbreed to produce fertile offspring.
Three-domain system	Classification into Archaea, Bacteria and Eukaryota, proposed by Carl Woese.
Archaea	Primitive bacteria, usually found in extreme environments.
Evolutionary tree	A diagram showing how organisms are thought to be related.
Fossil	The remains or traces of an organism from millions of years ago, found in rock.
Extinction	When there are no individuals of a species left.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is the correct order of groups, from largest to smallest?
2. In the name Homo sapiens, what is 'Homo'?
3. Who proposed the three-domain system?
4. Which domain contains plants, animals and fungi?
5. Where do Archaea usually live?
6. What do evolutionary trees show?
7. Why are there few fossils of early life forms?
8. Which of these can form a fossil?

Your notes

Answers

1. Kingdom, phylum, class, order, family, genus, species
2. The genus
3. Carl Woese
4. Eukaryota
5. In extreme environments
6. How organisms are thought to be related
7. They were soft-bodied and traces were destroyed by geological activity
8. A footprint preserved in rock

What to do next

Practise 10 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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