Your notes

KS3 Science: revision notes

B2.3 Life diversity

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Variation

- **Variation** is the differences between organisms of the same **species**.
- Some **variation** is inherited (eye colour, blood group), some is caused by the environment (scars, accent, language), and some is caused by both (height, body mass).
- **Continuous variation** can take any value in a range (height, mass) and is shown on a histogram or line graph. **Discontinuous variation** falls into distinct groups (blood group, tongue rolling) and is shown on a bar chart.
- A **species** is a group of organisms that can breed together to produce fertile offspring.

Inheritance

- Characteristics are passed on in **genes**. A **gene** is a section of DNA, and DNA is found in **chromosomes** in the nucleus.
- Human body cells have 23 pairs of **chromosomes** (46). Sex cells have 23, so a baby gets half its **chromosomes** from each parent.
- DNA has a double helix shape. Watson and Crick worked out its structure in 1953, using X-ray images made by Rosalind Franklin.

Selective breeding and natural selection

- Selective (artificial) breeding: humans choose parents with useful characteristics, breed them, and repeat over many generations (cows that give more milk, wheat with bigger grains, dog breeds).
- **Natural selection** (Charles Darwin): there is **variation** in a **species**; organisms compete; those best adapted to the environment are more likely to survive and reproduce; they pass on their genes, so the useful characteristic becomes more common.

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- Over many generations, **natural selection** causes **evolution**. **Fossils** give evidence of how species have changed.
- Peppered moths: when soot darkened tree trunks, dark moths were better camouflaged and eaten less, so they became more common.

Extinction and human impact

- A **species** becomes extinct when there are no individuals left, for example because of a changing environment, new predators or diseases, competition, or habitat destruction.
- Humans affect **natural selection** too: overusing antibiotics has led to resistant bacteria such as MRSA.
- **Gene** banks and seed banks store genetic material to protect **species**.
- Maths in science: 5 out of 20 = 5/20 = 1/4 = 25%.

Key terms

Variation	Differences between organisms of the same species.
Continuous variation	Variation that can take any value in a range, such as height.
Discontinuous variation	Variation that falls into distinct groups, such as blood group.
Species	A group of organisms that can breed to produce fertile offspring.
Gene	A section of DNA that controls a characteristic.
Chromosome	A long strand of DNA in the nucleus.
DNA	The molecule that carries genetic information.
Selective breeding	Humans choosing parents with useful characteristics to breed.
Natural selection	Organisms best suited to their environment surviving and passing on their genes.
Evolution	The gradual change in a species over many generations.
Extinction	When there are no living members of a species left.
Fossil	The remains or traces of an organism preserved in rock.

Quick questions

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

1. Which of these is an example of discontinuous variation?
2. Which of these is caused only by the environment?
3. How many chromosomes are in a normal human body cell?
4. Where are chromosomes found?

Your notes

5. What is a gene?
6. What is selective breeding?
7. Who proposed the theory of evolution by natural selection?
8. Which organisms are most likely to survive and reproduce?

Answers

1. Blood group
2. A scar
3. 46
4. In the nucleus
5. A section of DNA that controls a characteristic
6. Humans choosing parents with useful characteristics to breed
7. Charles Darwin
8. Those best adapted to their environment

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

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