Topic: Continuity and Variation – Stability and Diversity in Life

This unit explores how genetic information is passed from one generation to the next, ensuring the continuity of species, while also examining the sources of variation that make individuals unique. By studying continuity and variation, learners understand both the stability of life processes and the diversity that drives adaptation and evolution.

Key areas of focus include:

- **Genetic Continuity** – how DNA replicates and is transmitted through cell division and reproduction, ensuring traits are inherited.
- **Reproduction and Inheritance** – the roles of mitosis and meiosis, sexual and asexual reproduction, and the passing of genetic material from parents to offspring.
- **Variation** – differences among individuals caused by genetic factors (mutations, recombination, and independent assortment) and environmental influences.
- **Types of Variation** – continuous variation (e.g., height, skin colour) and discontinuous variation (e.g., blood groups, flower colour).

Significance of Variation – how diversity within populations supports survival, natural selection, and evolutionary change.

- **Applications** – examples in agriculture, medicine, and conservation where understanding variation is essential.

By the end of this topic, students should be able to:

- Explain how genetic continuity is maintained across generations.
- Distinguish between sexual and asexual reproduction in terms of variation.
- Identify sources of genetic and environmental variation.
- Differentiate between continuous and discontinuous variation with examples.
- Appreciate the importance of variation for adaptation, survival, and evolution.

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