N5 Biology **LE6 Evolution of Species** LEARNING OUTCOMES

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| -+\* | By the end of the lesson you should be able to  |
| **Mutations** |  | * I can state that a **mutation** is a random change to genetic material
* I can state that mutations may be **neutral**, causing no effect or they may confer an **advantage** or a **disadvantage** to survival
* I can state that mutations are **spontaneous** and are the only source of **new alleles**
* I can explain the environmental factors, such as **radiation** (X rays / UV rays) and some **chemicals** (mustard gas), can increase the rate of mutation
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| **Variation** |  | * I can state that an **adaptation** is an inherited characteristic that makes an organism well suited to survival in its environment/niche.
* I can explain that **new alleles** produced by mutation can result in plants and animals becoming better adapted to their environment.
* I can explain that **variation** within a population makes it possible for a population to **evolve** over time in response to changing environmental conditions
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| **Natural Selection** |  | * I can explain that species produce **more offspring** than the environment can sustain
* I can explain that natural selection (or survival of the fittest) occurs when there are s**election pressures** e.g. lack of food, cold, predation, disease
* I can explain that the **best adapted** (i.e. ‘fittest’) individuals in a population **survive to reproduce**, passing on the favourable alleles that confer the selective advantage
* I can explain that these alleles **increase in frequency** within the population
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| **Speciation** |  | * I can explain that **speciation** occurs after part of a **population** becomes isolated by an **isolation barrier.**
* I can state that **isolation barriers c**an be **geographical, ecological or behavioural**
* I can give **examples** of geographical barriers (e.g. rivers), ecological barriers (e.g. pH, salinity or different habitats) and behavioural barriers (e.g. diurnal vs nocturnal).
* I can explain that after isolation, different **mutations** occur in each sub-population
* I can explain that natural selection selects for different mutations in each group, due to different **selection pressures**
* I can explain that ultimately, each sub-population evolves until they become so genetically different that they are two different species (=> **speciation**)
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