Lion Fitness Data

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| --- | --- | --- | --- | --- |
| **Name** | **George** | **Dwayne** | **Spot** | **Tyrone** |
| Age at Death | 13 years | 16 years | 12 years | 10 years |
| # of Cubs fathered | 19 | 24 | 21 | 21 |
| # of Cubs surviving to adulthood | 13 | 11 | 11 | 15 |
| Size (length) | 10 feet | 8.5 feet | 9 feet | 9 feet |
| Other Information | George fought off more male lions trying to take over his family group than the other males did. | Dwayne had the most lionesses in his family group. | Spot’s family group included three sets of triplets. | A fire burned Tyrone’s home territory, and he moved his family group to a new area. |

TEXT- ***Living Species Adapt and Evolve***

Any inherited structure, behavior, or internal process (trait) that enables an organism to respond to environmental factors and live to reproduce offspring is called an **adaptation**.  Examples of adaptations are the spines on a cactus which are reduced leaves.  These spines increase the chances of surviving from drying out in the desert.

Charles Darwin knew that each individual differs from all the other members of that species.  Sometimes the differences are easy to observe; sometimes differences are subtle.  Individuals whose characteristics are not well suited to the environments either die or leave fewer offspring.  This principle Darwin called **survival of the fittest** (or natural selection).

Adaptations are inherited from previous generations.  Random mutations occur when copying the genes to be inherited by the next generation which result in differences or **variations** in traits.  Many of these differences are neutral or even harmful to survival but in as the environment changes, some variations are more suited to the new conditions than others.  Individuals with more suitable variations thus have an adaptation which makes them more likely to survive and reproduce.  As a result, individuals with these adaptations become more numerous in the population.

One way to determine how effectively a trait contributes to reproductive success is to measure fitness.  **Fitness** is a measure of the relative contribution an individual trait makes to the next generation.  It often is measured as the number of reproductively viable offspring that an organism produces in the next generation.

Darwin’s big contribution was not the idea that species changed or even that they were uniquely adapted to their environment.  Those ideas was at least one hundred years old during Darwin’s time.  His big idea was **natural selection**, that nature was able to select those individuals that were most fit to survive and thus increase their adaptive trait in the next generation through increased reproduction.  Thus the population **evolved** through the reproductive fitness of individuals.