Answers

1. Interpret the graphs opposite. How did the **average** beak size change between 1976 and 1978

* In 1976, before the drought average beak depth is 9.5 mm
* In 1978, after the drought average beak depth is approximately 10.1 mm
* Average beak depth of Finches increased from 9.5 mm to 10.1 mm after the drought in 1977

1. Using your knowledge of microevolutionary forces and the data provided, explain how the finches beak depth changed after the drought in 1977

|  |  |
| --- | --- |
| Description | Marks |
| Total 8 marks |  |
| * prior to the drought in 1977 natural selection favoured finches with smaller beak depth * because smaller beak depth is more suitable for feeding on soft seeds (these are preferred by the finches) * Due to the drought the soft seeds were exhausted and the finches started to consume the larger, tougher seeds * Finches with large, powerful beaks were able to feed on the large, tough seeds * shorter beaks may have arisen by mutation or there was variation in beak length in the population * Finches with larger beak depth are favoured by natural selection/fitter/leave more offspring * pass alleles for large beak depth to offspring * over time/generations alleles for larger beaks became increasingly common in finches | 1 - 8 |
| Total 2 marks |  |
| Accurate quote of the data   * quote beak depth prior to drought * quote beak depth after drought | 1 - 2 |

1. Describe the data observed in the table above at both locations. Your description MUST include the following:
   1. A description of how the population changed over time

Location A

* The number of light fur mice increased by 1 from the first to the fourth generation
* The number of dark fur mice decreased by 1 from the first to the fourth generation
* The numbers of light and dark coloured mice at this location are relatively stable/no not change greatly

Location B

* The number of light fur mice decreased from the first to the fourth generation
* There was a sharp/large decline in the number of light fur mice between the second and fourth generation
* The number of dark fur mice increased from the first to the fourth generation
* There was a sharp/large increase in dark fur mice between the second and fourth generations

1. Using your knowledge of the principals of natural selections, explain your observations in the previous question for location B

|  |  |
| --- | --- |
| Description | Marks |
| Total 8 marks |  |
| * There is variation within the population with light fur and dark fur mice – variation exists * Location B first generations natural selection favoured light fur mice * because light fur mice are better suited to the light-coloured sands as they are able to camouflage and evade predators * After the second generation the number of light fur mice decrease and dark fur mice increase * This is because there is a change in the environment and dark fur mice are better able to camouflage and evade predators on the dark coloured volcanic rock * Dark fur mice are favoured by natural selection/fitter/leave more offspring * pass alleles for dark fur to offspring * over time/the four generations alleles for dark fur became increasingly common in the mice | 1 - 8 |