**NATURAL SELECTION AND ARTIFICIAL SELECTION**

**QUESTION 1**

1. Evolution by natural selection-Within the population of cactus there exists variation, some of the cacti had thorns and others did not have thorns. The cacti with thorns were not eaten by the deer, whereas the cacti without thorns were eaten by the deer. The cactus without thorns were eaten and died, whereas the cactus with thorns were not eaten and survived. The cactus that survived reproduced and passed this allele onto their offspring, over many generations there were more cacti with thorns than without thorns.

2. Organisms in a population become better adapted to their environment over time. This causes the gene pool of the population to change over time. If the gene pool changes so much that individuals from the new population can no longer breed and produce fertile offspring with the individuals from the ancestral population then a new species has evolved.

**QUESTION 2**

1. The brown frog-it is not poisonous therefore it is consumed by predators/ reduces predation.

2. Within the lake there exists variation in the colour of frogs. Some frogs are yellow and others are brown. The frogs that are brown are not poisonous; therefore they are killed and eaten by predators. Those frogs that are yellow are poisonous; therefore they are not killed and eaten by predators. These yellow frogs survive and reproduce, passing the allele/characteristic onto their offspring. Over many generations, there will be more individuals within the population that are yellow.

**QUESTION 3**

1. 64days

2. 64 – 35 = 29 days

3. Artificial selection-the chicken that grew the quickest/reached a mass of 5kg the fastest was bred.

4. Less time required to reach desired mass-increases the farmer’s profits

5. Products produced more quickly/ increased resistance to disease/ improved quality of chicken products/ improved yield of chicken products

6. The chickens are larger in mass and would not be able to run away from predators. They would be more visible to predators

7. Table showing differences between artificial selection and natural selection

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| **Artificial selection** | **Natural selection** |
| People decide which characteristics are desirable | The environment decides which characteristics will survive |
| Quicker process | Slow process |
| Traits that are not necessarily the best for the a particular environment  | Traits that are best suited to the environment are passed on |

8. There must be genetic variation within a population. There must be an overproduction of offspring. There must be competition for resources. There needs to be a change in the environment. Only the fittest survive.