**FORMATION OF NEW SPECIES**

**QUESTION 1**

1. Allopatric speciation

2. Initially there was a single population of squirrels that occupied they were able to interact and breed with each other. The population was separated by the river into two populations. They were no longer able to interbreed and there was no gene flow between the two groups. On either side of the barrier the environmental conditions were different such that natural selection occurred independently on either side of the barrier resulting in a different phenotypic characteristic becoming dominant. After many generations the two populations became genotypically and phenotypically different such that even if the barrier was removed they will no longer be able to interbreed.

3. In punctuated equilibrium evolution involves long period of time where species do not change/very little change. This alternates with short periods of time when rapid changes occur. New species are formed in a short period of time.

**QUESTION 2**

1. Allopatric speciation

Within the original population after the mutation there existed variation. There was gene flow, the Prairie dogs were able to interbreed with each other. The river separated the original population of Prairie dogs into two populations. They were no longer able to interbreed and there was no gene flow between the two groups. On either side of the barrier the environmental conditions were different such that natural selection occurred independently on either side of the barrier resulting in a different phenotypic characteristic becoming dominant. After many generations the two populations became genotypically and phenotypically different such that even if the barrier was removed they will no longer be able to interbreed.

2. There are now 2 new species this increases biodiversity

3. Sex organs are not compatible for copulation

If copulation does occur the chemical characteristics of the gametes not recognizable

Sperm not recognize the ova