5.6 Speciation

The formation of a new species from one already existent species

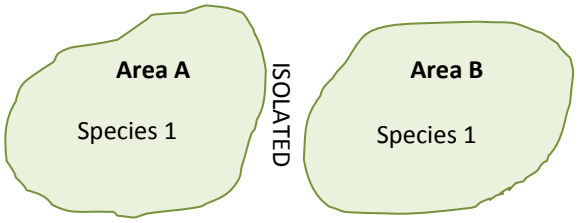
The correct definition of a **species** is a group of individuals which have a similar appearance, are similar in anatomical, physiological, behavioural and biochemical features and can all successfully interbreed to product fertile offspring.

There is a certain amount of difficulty applying this definition to all species, because there is always variation in and between (a) species, and there may also be differences with, for example, males and females.

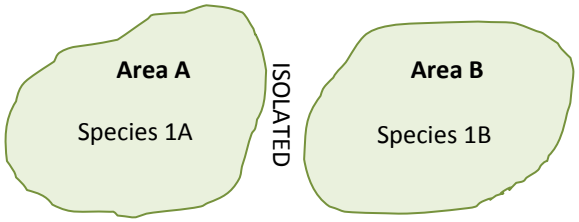
The term **speciation** simply means going from one species into two. It is the formation of two species from a single common ancestor. The simplest method of speciation is through **geographical isolation**. This type is called **allopatric speciation**. The staged diagrams below describe the process of allopatric speciation:

1 The ancestral species (species 1) occupies a continuous area of woodland

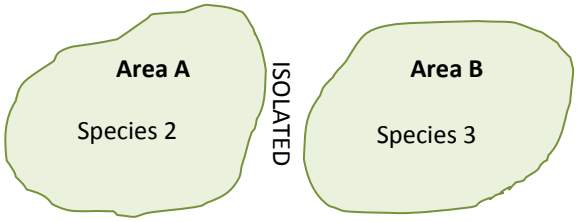
2 An external influence causes the habitat to be split into two distinct areas – the area of isolation cannot be crosses



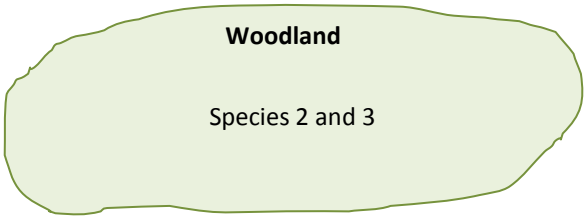
3 Through natural selection and random (chance) mutations, etc, the two populations accumulate differences over a long period of time



4 If this continues for long enough, the two populations become sufficiently different that they can no longer successfully interbreed (either for physical, behavioural or genetic reasons)



5 [Optional] The habitats may rejoin and the species **coexist** as separate species. Competition may wipe out one species, but they may coexist provided, for example, there is an abundance of survival materials, e.g. food, water and shelter, to eliminate the possibility of competition arising



There is a second type of speciation, called **sympatric speciation** which occurs when two populations overlap in their distribution, and become reproductively isolated through a non-geographical means. For example, in finches, if a large-beaked finch breeds with a small-beaked finch to produce a medium-beaked finch, but there are no medium-sized seeds available for food, the medium-beaked finch will be unsuccessful.