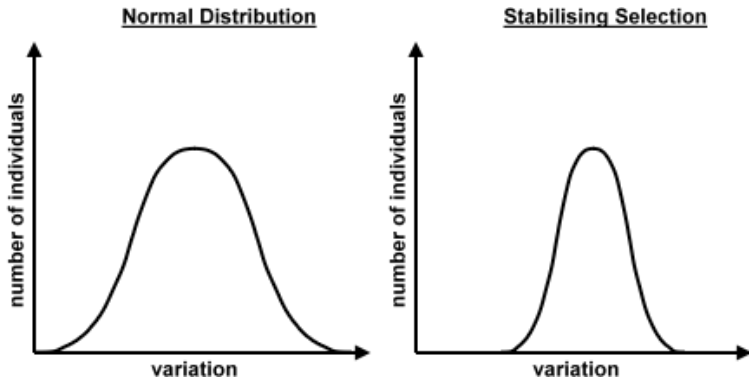
9.3 Genetic Diversity

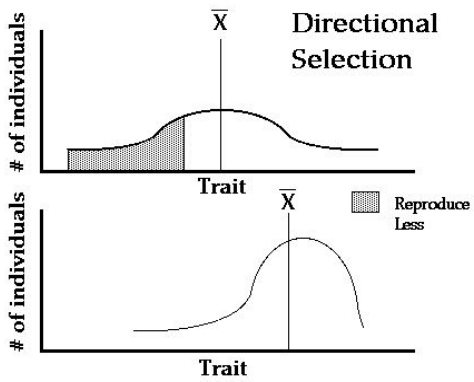
Genetic Diversity: Total number of different alleles in a population

Natural selection: (pg 230)
1. Any population has a gene pool with a wide variety of alleles
2. Random mutation leads to new alleles with the population
3. If a selection pressure is applied (i.e. change in climate, use of antibiotics), some alleles may confer a selective advantage
4. Organisms with these alleles are more likely to survive and reproduce
5. These new alleles get passed on to the next generation
6. Over time the frequency of advantageous alleles will increase in the population

Natural selection: Stabilising selection (pg 233)
1. Environment remains stable
2. Individuals with phenotypes close to the mean are selected, more likely to pass on alleles
3. Those at the extremes are less likely to pass on their alleles
4. The median remains unchanged



Natural selection: Directional selection (pg 231)
1. Environment changes, selection pressure applied
2. Alleles at one extreme selected for, and the alleles at the other end selected against
3. The median changes



10. Biodiversity

10.1 Naming species (already covered in class - please read through pag 237-238)

Courtship behaviour (pg 238) is necessary because it allows members of a species -

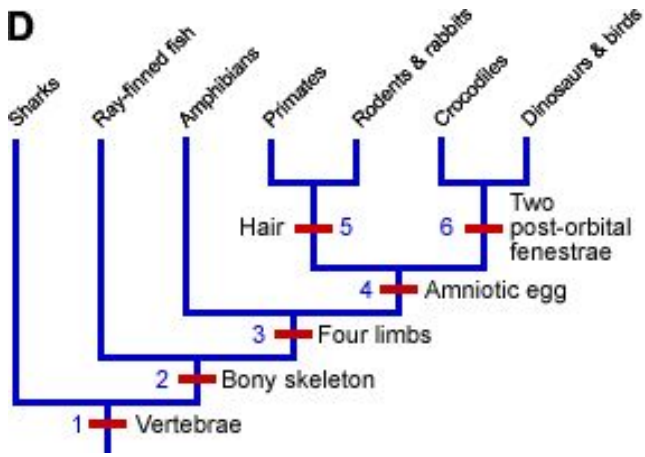
1. To recognise members of their own species
2. To identify a mate that is capable of breeding (fertile)
3. To form a pair bond, which helps with care of young
4. To synchronise mating, to maximise chances of fertilisaiton
5. Bringing a member of the opposite sex to a physiological state where they are able to breed

Principles of classification (pg 239)
Artificial classification: divides organisms using attributes like shape, size, colour, etc.

Phylogenetic classification:
- is based on evolutionary relationships
- arranges smaller groups into larger groups with a hierarchy, with no overlap between groups
- classifies species using shared features derived from their ancestors

Domains - we have already covered the basics in class, read and make notes from pg 240

Phylogenetic tree
- shows the evolutionary relationships between organisms
- the common ancestor (oldest species) is at the base of the tree
- the most recent species are att he top of the tree



This tree shows that crocodiles and dinosaurs are more closely related than crocodiles and primates. Dinosaurs are most distantly related to sharks as they diverged very early in time.

Index of Diversity: (pg 243) will be covered in class

10.3 Species diversity and human activity - self-study, please read and make notes (pg 246)

10.4 Investigating diversity (pg 249): will be covered in class

10.5 **Quantitative investigations** (pg 253) - the maths has already been covered, I will just highlight the key points here.

Making measurement - the significance of random sampling

Random sampling involves taking measurements of individuals, selected from a population, **without bias**. All individuals have an equal chance of being selected. This ensures that the sample is **representative** of the population.

For example, if we are measuring the number of daisies in a field, we can minimise the effects of bias by the method outlined below:
- mark an area to be sampled using tape or twine
- divide the study area into grids
- use a random number generator to generate (paired) coordinates
- take samples at the intersection of coordinates

We can minimise the effects of chance by:
- using a large sample size - this increases reliability of the data
- using the correct statistical analysis to analyse the data - take a mean, and calculate standard deviation and/or standard error