invertebrates	key features
molluscs	- crawl on a single fleshy pad
sponges	- have bodies made of loosely joined cells
echinoderms	- have bodies divided into 5 parts - have a spiny outer covering
arthropods	- have jointed legs - have bodies in sections - have hard, thick outer covering
annelids	- have round, worm like bodies - have bodies in segments
cnidarians	- have thin, sacks like bodies - have tentacles
flatworms	- have flat, worm like bodies
roundworms	- have long, thin, round worm like bodies - have bodies without segments

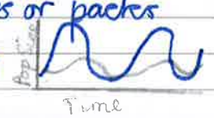
arthropods	key features
arachnids	- 4 pairs of legs - no wings - bodies divided into 2 sections
insects	- 3 pairs of legs - bodies divided into 3 sections - often have wings
crustaceans	- 5-7 pairs of legs - 1st pair usually pincers - bodies covered in chalky shell
centipedes and millipedes	- long, thin bodies - a pair of legs on each body section

Variation and Inheritance
- We inherit some characteristics from our parents
- Other features are caused by the environment
- Inherited features: hair colour, eye colour, height etc.
- Environmental features: weight
- Chromosomes are the large molecules in the nucleus of cells. They are made up of DNA which makes up our genes
- Each human cell contains 23 identical pairs of chromosomes

Selective Breeding
- Living organisms get 2 scientific names, the first the genus, the second the species
- They are classified on the basis of their shared features
- By mating 2 animals with good features, the offspring will likely inherit these features. Over a number of generations, this can become permanent. It is called selective breeding eg. cows that produce a lot of milk / hens which lay many eggs / wheat that is disease resistant

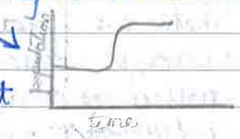
Adaptation: Habitat
- A habitat is a place where an organism lives
- Environment = the conditions in a habitat
- Organisms have adapted features to help them live in their habitat
- Living organisms compete for resources: territory, mates, food, water, shelter, light, oxygen
- Animals and plants adapt so they can successfully compete for resources eg. Snowdrops sprout early, because the sun can reach the woodland floor, hedgehogs don't have lots of food, so they hibernate for winter

Feeding Relationships
- Predators kill prey for food
- Predators adapt to hunting: often powerful and fast, camouflaged and have sharp claws and teeth
- Prey animals adapt to predators hunting them, they are often camouflaged, and usually stay together in groups or packs
- There is a relationship between predators and prey



- predators
- prey

Population
- A population is a group of animals or plants living in the same habitat
- Populations usually grow in the following way:



- This graph show the population grows slowly, then accelerates. It then slows down again, and levels out so there are the same number of births and death.
- Population growth can be slowed by: light, overcrowding, lack of food and water, disease, climate, predators, oxygen and shelter

Food chains + webs
- Food chains show the way energy passes from one organism to another
- A pyramid of numbers shows how many organisms are involved in the food chain, on each level
- At the beginning of the food chain there are more organisms involved, so they are on the bottom of the pyramid

Pesticides
- Pesticides are chemicals that kill pests
- They can get into the food chain and affect it
- eg. DDT causing damage to birds of preys' eggs
- Concentrations of pesticides are measured in parts per million (ppm)
- The concentration of pesticides increase the further down the food chain
- Chemical fertilisers are easy to use; farmers use them all the time, but they can pollute waterways
- Natural or organic fertilisers break down more slowly
- Algae are small plants that live in water; they are at the start of many food chains
- If there are excess nutrients, algae grows too fast. When they die, the microbes that break them down use too much oxygen; this stops the other water animals from getting the oxygen they need, so in the end they die
- If mayfly larvae or stonefly larvae are present, then the water isn't polluted. If sludge worms and blood worms are present, the water is polluted. If freshwater shrimps and water lice are present, the water may be a little polluted.

Reproduction in Plants
- Many plants reproduce sexually. They have male and female sex (gametes) cells that form a zygote
- Male gametes = pollen grains; female gametes = ovules
- Flowers are the reproductive part of the flowers; the petals are brightly-coloured to attract animals; the sepals protect and support the flower
- Carpels: a) stigma: sticky so pollen sticks on it
  b) style: holds up the stigma
  c) ovary: contains the ovules (female gametes)
- Stamens: a) anther: holds the pollen grains (male gametes)
  b) filament: holds up the anther
- Some flowers produce nectar, so they have nectaries
- Pollination is the pollen transferring from one flower to another. This can happen by animals, or by the wind.