**Predators**

A predator is an animal that feeds by hunting and killing its prey. They are omnivores (eat meat and vegetation) or carnivores. They are usually bigger and fewer in number than their prey.

**Predators** are adapted to hunt, catch and eat prey.

What are common predator adaptations for hunting and killing?

* **Excellent vision** – For spotting prey from far away. Many predators have binocular vision to accurately judge the distance of their prey.
* **High speed** – For chasing after prey. Predators often stalk their prey using stealth and sometimes camouflage to get as close as possible without being detected.
* **Weapons** – For killing prey. These are predominantly sharp teeth, claws and beaks, which enable the predator to hold their prey and tear their flesh.

**Other adaptations:**

**Poison** has evolved as an adaptation of predators and prey. Organisms such as snakes, spiders and insects use poison to paralyze or kill prey.

Other adaptations include pack hunting, attacking prey that is old/young/injured, eating a wide variety of species.

**Prey**

**Prey** animals are adapted to avoid capture from predators.

What are common prey adaptations for avoiding capture by predators?

* **Excellent vision** – For spotting predators from far away. Many prey have a wide field of view to see predators approaching from all different directions.
* **High speed** – For escaping from predators. Prey animals such as deer and antelopes often have a high stamina to keep running for longer than their predators.
* **Camouflage** – For hiding from predators. For example, the stripes on a zebra break up their outline, stick insects look like twigs, some insects look like leaves.
* **Defence** – For protection against attack. Examples include armour plating, horns, stings and tusks.

**Other adaptations**

**Poison** has evolved as an adaptation of predators and prey. Some organisms use poison as a defence. Certain tropical frogs have poisonous skin that can make predators very ill or even die. They are often brightly coloured to deter predators from even trying to attack them.

Some harmless organisms have become adapted to look like dangerous species. This is called **mimicry**. For example, stingless hoverflies have black and yellow bands on their bodies that resemble those on wasps or bees. This warns predators to stay away, even though the hoverfly is incapable of stinging.

Warning colours are another form of defence. They tell the predator to keep clear.

**Competition in plants**

Plants compete for resources - **light, water, space and nutrients**

Competition restricts the size of a population

There are 2 types of competition:

Competition between individuals of the same species

Competition between individuals of a different species

Only the best adapted individuals will survive and go on to breed

Weeds are excellent competitors. They can reproduce quickly and produce many seeds, they grow well in poor soil, they can tolerate harsh conditions.

**Light**

**Bluebells and snowdrops** flower early in the year in the woods to be able to get plenty of light through the bare branches of the trees. This also allows them to take advantage of the nutrient-rich soil from autumn’s leaf fall. They set seed and die back before the trees are in full leaf.

**Epiphytes** (eg, the orchid) are also adapted to grow on taller trees to reach light

Other adaptations to capture light include growing faster/taller than surrounding plants, and having leaves with a large surface area.

**Water**

Different types of **roots** allow plants to compete. Some plants might have shallow roots taking water and nutrients from near the surface, while other plants have long deep roots that go far underground. This means both plants can live together without directly competing.

**Nutrients**

**Leguminous** plants (such as beans and peas) have nitrogen-fixing bacteria in the nodules of their roots. These bacteria ‘fix’ atmospheric nitrogen making it available for the plants to use. This allows them to have a real edge over competing species that have to take nitrates from the soil.

**Space**

Effective seed dispersal mechanisms ensure the parent plant isn’t competing with it’s own seeds. Examples include dandelions, popping seed pods which fling the seeds away, fruit (to tempt birds to eat it) and seeds with hooks (to stick onto the fur of passing animals)

**Competition in animals**

Animals compete for resources - food, territory and mates

Competition restricts the size of a population

There are 2 types of competition:

Competition between individuals of the same species

Competition between individuals of a different species

Only the best adapted individuals will survive and go on to breed

**Mates**

In many species, the male animals put a lot of effort into impressing the females.

In some species – deer, lions – the males fight between themselves. The winner gets to mate with several females.

Many male birds put on spectacular displays in order to attract the attention of the female (eg, peacocks, bird of paradise).

**Territory**

Setting up and defending a territory is vital for successful breeding. Many animals **mark** the boundaries of their territories with urine or faeces to keep other competitors out. Others **defend** their territory (eg, birds with their nests).

**Food**

Competition for food is very common. Herbivores will often eat many different types of plant in order to have other options should one food source be in short supply. The panda is a poor example of a successfully adapted herbivore.

Carnivores compete for prey and have adaptations to allow them to do this.