

# Knowledge organiser – 7.5 Evolution & Adaptation

## Natural selection

Organisms in a species show variation – this is caused by differences in their genes.



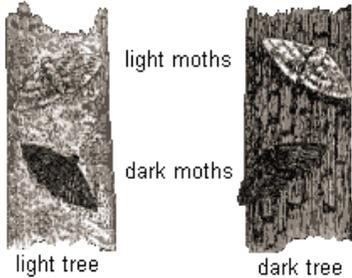
The organisms with the characteristics that are best adapted to the environment survive and reproduce. Less well adapted organisms die. This process is known as 'survival of the fittest'.



Genes from successful organisms are passed to the offspring in the next generation. This means the offspring are likely to possess the characteristics that made their parents successful.

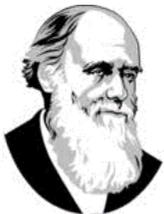


This process is then repeated many times. Over a period of time this can lead to the development of a new species.



**Before industrial revolution:** pale moths were camouflaged against tree barks, Dark moths were easily seen.

**After revolution:** dark moths were camouflaged against soot-blackened trees.



**EXTINCTION:** If the species is not adapted to its environment, it will not survive. Fossil records show how many organisms have become extinct.

## These factors can lead to extinction:

- Changes to organism's environment
- Destruction of habitat
- Outbreak of new disease
- Introduction of new predators
- Increased competition for resources.
- Human activity

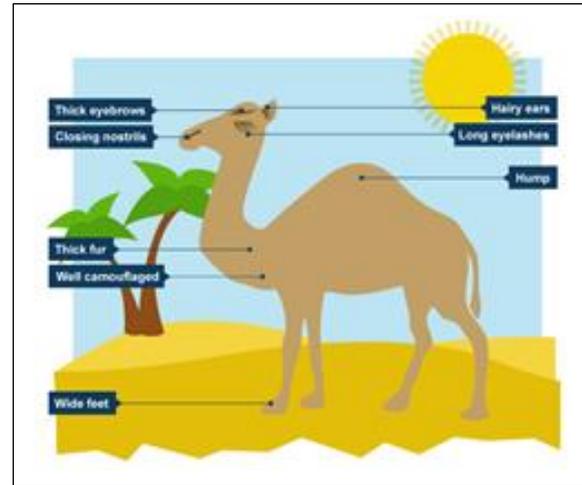
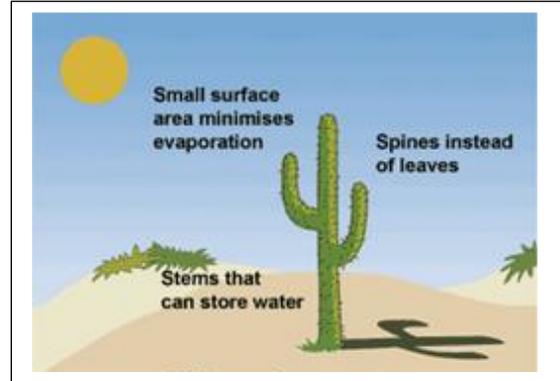


## Preventing extinction:

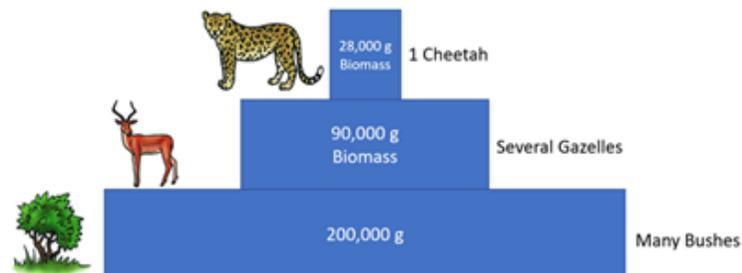
- Conservation; ensure habitats are not lost, reduce disruption to food chains and webs
- Captive breeding; create stable and healthy population of species to re-introduce back into natural habitats. But, it can be difficult to maintain genetic diversity and organisms may not be suited to return, e.g. if they cannot hunt.
- Gene banks; seed banks (plants), tissue banks (plants), cryobanks (seed/ embryo/ sperm and egg cells); pollen banks.

- **Darwin's theory:** organisms evolve as a result of natural selection.
- People disagreed with him because they believed his theory went against the view that God created all life on Earth.
- Evidence for his theory: fossil records, observational changes in micro-organisms and extinction.

**ADAPTATION:** An adaptation is a change to an organism's physiology that happens over many generations that allows it to better survive in the habitat it lives in.



## PYRAMID OF BIOMASS:



KEYWORD	DEFINITION
Adaptation	How an animals body or behaviour help it to succeed in a particular habitat
Biodiversity	Measure of variety of different species on Earth/ ecosystem.
Biomass	
Captive breeding	Breeding animals in human controlled environments.
Competition	When two or more organisms struggle for the same resource.
Conservation	Protecting a natural environment / habitat.
Endangered species	A species with only small numbers of organisms left.
Evolution	Theory that living organisms descended from a species that existed in the past
Extinct	When no more individuals of a species remain anywhere in the world.
Fossil	Remains / traces of plants and animals that have turned to stone.
Natural selection	Process by which species change over time.
Peer review	Evaluation of a scientists work by another scientist.
Populations	Group of same organisms living in the same place.
Pyramid of biomass	A pyramid of biomass shows the biomass at each trophic level , rather than the population.
Trophic Level	The position an organism occupies in a food web

