

Knowledge Organiser: Year 7: - Variation

Section 1: Key Words

Species	Organisms that can interbreed to produce fertile offspring
Nucleus	contains genetic material, which controls the activities of the cell
Inherited	a characteristic passed on genetically from one's parents or ancestors
Variation	Differences in a population of organisms
Adaptation	characteristic of an organism that improves its chances of surviving and/or reproducing
DNA	A chemical that carries genetic information
Chromosomes	A packet of DNA, humans have 46
Gene	Section of DNA that codes for a characteristic
Genetic variation	Variation due to genetic causes e.g. eye colour
Environmental variation	variation is due to the environment e.g. tattoo, accent
Continuous variation	Characteristics that have a range of values boundaries can often keep getting smaller/larger e.g. height
Discontinuous variation	Characteristics fall into distinct categories that have clear boundaries e.g. shoes size
Heredity	passing on of characteristics genetically from one generation to another
Natural Selection	Process occurring over millions of year. That causes organisms to evolve because those that are better adapted to their environment survive and produce more offspring.

Section 5: Advantages and disadvantages of variation

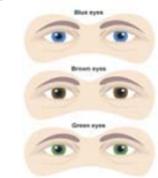
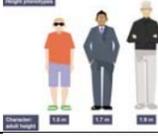
Advantages	Disadvantages
Provides basis of evolution	Takes time to develop
Allows selective breeding	Variation may be bad for individual organisms
Allows organisms to adapt to a situation	

Section 6: Adapting to an Environment

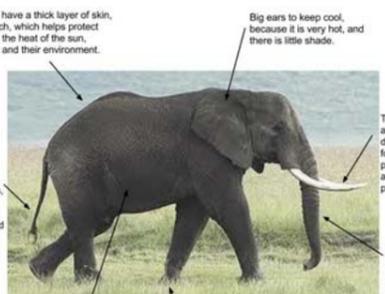
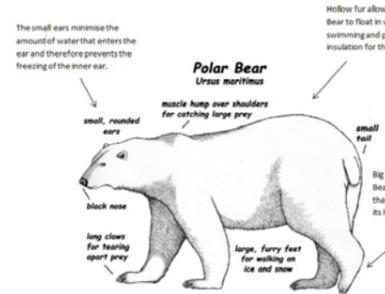
Variation	Clone (no variation)
<ol style="list-style-type: none"> Differences in the population These differences mean some of the species are better suited to their environment if it changes These organisms who can now survive in the new conditions breed and pass on genes Offspring now have advantages of organism that reproduced (the fittest organism). Over time this creates a new species This is called natural selection 	No variation means that if there is a change in environment all the organisms in a species die if they are not suited to the change.

Section 2: Features that show variation

There are lots of features in all organisms that show variations. The table below shows some of them

Organism	Feature	Diagrams	Cause
Human	Tongue rolling		Genetic
Human	Ear lobes		Genetic
Human	Eye colour (natural)		Genetic
Human	height		Genetic and environmental
Human	Weight		Genetic and environmental
Human	Accent		Environment
Human	Scars and tattoos		Environment
Tree	Leaf shape		Genetic
Mice	Coat colour		Genetic

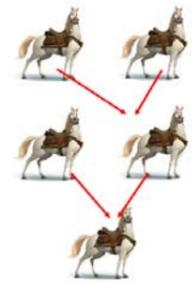
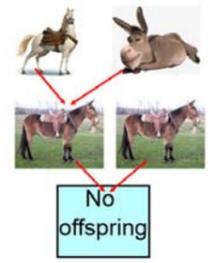
Section 7: Adaption

Hot Environment	Cold Environment
<p>Elephants have a thick layer of skin, about 1 inch, which helps protect them from the heat of the sun, predators, and their environment.</p> <p>Big ears to keep cool, because it is very hot, and there is little shade.</p> <p>These tusks are used for digging and for protection against predators.</p> <p>The tail is used for swatting away bugs, and the elephants babies hold on to the tail.</p> <p>The elephants trunk is great for picking up things, smelling, and touching things.</p> <p>Elephants drink about 50 gallons of water a day, to help them stay hydrated.</p> <p>The African Bush Elephant has such big feet, because it needs a big foundation.</p> 	<p>The small ears minimise the amount of water that enters the ear and therefore prevents the freezing of the inner ear.</p> <p>Hollow fur allows the Polar Bear to float in water when swimming and provides insulation for the Polar Bear.</p> <p>muscle hump over shoulders for catching large prey</p> <p>small, rounded ears</p> <p>small tail</p> <p>Big paws allow the Polar Bear to swim easily in the water surrounding its habitat.</p> <p>long claws for tearing apart prey</p> <p>large, furry feet for walking on ice and snow</p> <p>black nose</p> <p>Polar Bear <i>Ursus maritimus</i></p> 

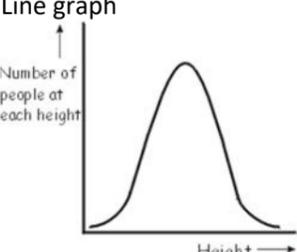
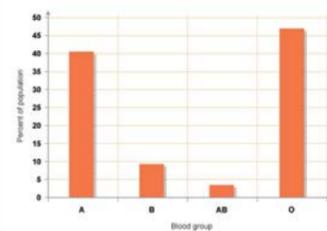
Section 3: Types of variation

Genetic	Variation caused by the genetic of an organisms
Environment	Variation caused by the environment or the place where the organisms is living
combination	A combination of the organism's genetics and environment

Section 4: What is a Species?

Same species	Different species
	
When organisms of the same species breed they have fertile offspring (their young can have reproduce)	When organisms of different species breed the have infertile offspring (their young cannot reproduce)

Section 4: Continuous and Discontinuous variation

	Continuous	Discontinuous
description	Variation that has no limit on the value that can occur within a population. There are a range of values.	Variation that has distinct groups or categories that the organisms can belong to
Graph	<p>Line graph</p>  <p>Number of people at each height</p> <p>Height</p>	<p>Bar graph</p>  <p>Percent of population</p> <p>Blood group</p>
Example	Height, weight, leaf length. Foot size, hand span	Tongue rolling, eye colour, shoes size