

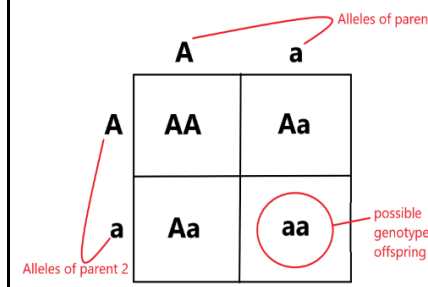
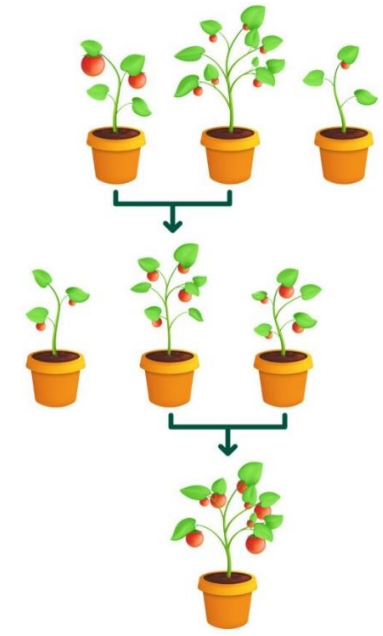
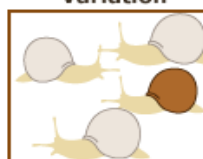




## Year 8 Knowledge Organiser: Variation and Inheritance

Key Terms	Forms of reproduction	Punnet Squares													
Gametes are the cells involved in reproduction. Each carries half the information needed to make a new individual.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p style="border: 1px solid black; padding: 2px; color: blue;">SEXUAL REPRODUCTION</p> <p style="color: blue;">FUSION OF TWO GAMETES</p>  <p style="color: blue;">GENETICALLY DIFFERENT OFFSPRING</p> </div> <div style="text-align: center;"> <p style="border: 1px solid black; padding: 2px; color: green;">ASEXUAL REPRODUCTION</p> <p style="color: green;">MITOSIS</p>  <p style="color: green;">IDENTICAL CLONE OF THE PARENT ORGANISM</p> </div> </div>			The alleles of parents are drawn on the outside and then each box is filled in to show which alleles could be inherited											
Fertilisation is when the nuclei of gametes fuse together to make a new cell.															
A zygote is the cell formed during fertilisation. This fertilised egg cell will begin to divide and grow.															
Sexual reproduction involves two parents who each produce gametes. These gametes will fuse in fertilisation. Offspring show genetic differences															
Asexual reproduction involves one parent, with no gametes and no fertilisation. Offspring are genetically identical clones	<b>Selective breeding</b>	<b>Variation, Adaptations and Natural Selection</b>													
A gene is a small section of DNA that controls one trait i.e. everyone has a gene that controls their eye colour		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>Variation</b></p>  <p>Individuals show variation. Some offer an advantage.</p> </div> <div style="text-align: center;"> <p><b>Natural selection</b></p>  <p>Best suited are favoured and selected.</p> </div> <div style="text-align: center;"> <p><b>New generations</b></p>  <p>Variation increases in frequency.</p> </div> </div>													
An allele is a different form of a gene i.e. your eye colour gene could give you blue eyes or it could give green eyes			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th style="width: 50%; text-align: center;">Forms of variation</th> <th style="width: 50%; text-align: center;">Adaptations</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Genetic – Caused by genes (e.g. eye colour, blood group, skin colour). This can also be called inherited variation as it can be passed on.</td> <td>Predators – Sharp claws, Camouflage, Forward facing eyes</td> </tr> <tr> <td>Prey – Large eyes, Side facing eye, Defensive spikes</td> </tr> <tr> <td rowspan="2">Environmental – Caused by the effects of the environment (e.g. scars, spoken language). This cannot be passed on.</td> <td>Cold environments – Small surface area to volume ratio, thick blubber / fur</td> </tr> <tr> <td>Hot environments – Large surface area to volume ratio, minimal body fat, nocturnal behaviour.</td> </tr> <tr> <td>Some variation is caused by both (e.g. Weight, Height)</td> <td></td> <td></td> </tr> </tbody> </table>		Forms of variation	Adaptations	Genetic – Caused by genes (e.g. eye colour, blood group, skin colour). This can also be called inherited variation as it can be passed on.	Predators – Sharp claws, Camouflage, Forward facing eyes	Prey – Large eyes, Side facing eye, Defensive spikes	Environmental – Caused by the effects of the environment (e.g. scars, spoken language). This cannot be passed on.	Cold environments – Small surface area to volume ratio, thick blubber / fur	Hot environments – Large surface area to volume ratio, minimal body fat, nocturnal behaviour.	Some variation is caused by both (e.g. Weight, Height)		
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A punnet square is a diagram used to show the probability of inheriting a trait. Letters are used to show different alleles															
A recessive allele is represented with a lower-case letter on a punnet square. Two copies are needed to have the trait.															
A dominant allele is represented with an upper-case letter on a punnet square. Only one copy is needed to have the trait.															
Variation is used to describe the differences in characteristics that are present in a population															
Adaptations are traits that individuals have inherited that help them to survive in their habitat.															
Selective breeding is when humans choose plants or animals to mate together to produce certain traits	Humans choose parents with desirable characteristics (e.g., high milk yield in cows, increased fruit production in plants and gentle nature in dogs) to breed together. This is repeated over many generations.														
Natural selection organisms best suited to their environment are more likely to survive and breed															