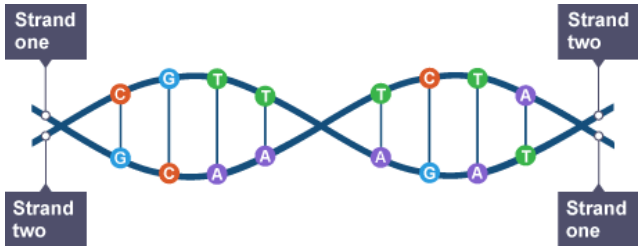
Year 8 Knowledge Organiser - Inheritance

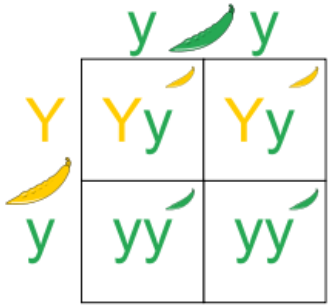
Inherited characteristics examples: natural hair and eye colour, detached or attached earlobes, having curly hair, having dimples, handedness, red/green colour blindness
Environmental characteristics examples: tattoos, scars, language spoken, accent, religion, hair style, piercings.

Key words:

Inherited characteristics: Features that are passed from parents to their offspring.
DNA: A molecule found in the nucleus of cells that contains genetic information.
Chromosomes: Thread-like structures containing tightly coiled DNA.
Gene: A section of DNA that determines an inherited characteristic.



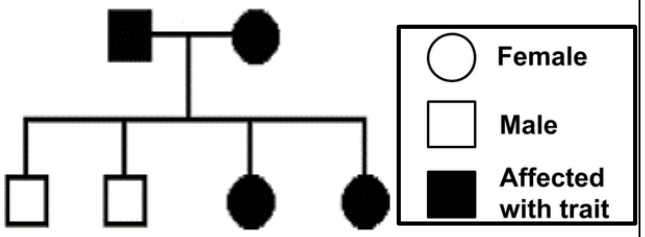
DNA is a chemical shaped in a **'double helix'** or twisted ladder. Molecules are made up of two strands and four bases. These bases form the 'rungs' of the ladder and are named **A,T,G** and **C**. As you can see on the diagram A always joins with T and C always joins with G.
The sequence of letters is a coded set of instructions to make an organism.
One small length of DNA is called a **gene**.



This is a **Punnet square**, it shows the parents genes (outside the box) and the probability of their offspring having each combination of genes (inside the box).

We can extract DNA from living things, fruits work well for this.

1. Peel the skin from half a kiwi fruit and mash it up – *breaks up cell walls and membranes.*
2. Mix a teaspoon of salt and small volume of washing up liquid into the fruit – *separates DNA from the proteins surrounding it.*
3. Gently heat this mixture at about 60°C for five minutes – *breaks down membranes and deactivates enzymes.*
4. Filter the mixture and retain only the filtrate (the filtered liquid) – *removes large pieces of fruit mush.*
5. Cool using an ice bath and gently pour chilled ethanol onto the top of the filtrate – *DNA makes a precipitate in ethanol so we can see it.*



We can demonstrate inherited characteristics using a **pedigree** like this one. We can use this to predict whether characteristics are **dominant** or **recessive**. They allow us to look at the characteristic shown (**phenotype**) rather than the genes (**genotype**) a person has.

Websites that might be useful:
https://www.bbc.com/bitesize/articles/zvwbcj6
https://www.youtube.com/watch?v=zwibgNGe4aY
Extension ideas to research:
How could mutations (changes to DNA) be useful?
Who discovered DNA and how did they do it?
How are the parts of the DNA molecule held together?