Firrhill High School

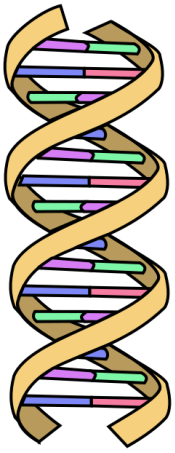
Summary Sheets: B4 Reproduction

WHAT SHOULD I KNOW?

Success Criteria	Before reading	After reading	Before my test
I can describe the structure of DNA.			
I can name the base letters in DNA.			
I can describe how the bases pair up.			
I can explain what a chromosome is and describe the difference in the sex chromosome of males and females.			
I can describe the function of the different parts of the male and female reproductive system.			
I can describe an experiment to extract DNA from fruit.			
I can identify the parts of the two reproductive systems.			
I can describe state the definition of fertilisation.			
I can describe how a fertilised cell develops in the womb.			
I can identify the main structures within the pregnant womb and describes their function.			
I can give examples of substances, including toxins, which can cross the placenta from the mother to the embryo.			
I can suggest ways which a pregnant mother can protect her child.			
I can state that a sex cell (gamete) contains half the genetic information needed to a make a complete individual.			
I can state the three types of microbes.			
I can describe ways which microbes are spread and suggest how to stop the spread of microbes.			

OUR DNA

What is in our DNA? Deoxyribonucleic Acid



DNA

This picture shows the structure of DNA.

DNA makes us who we are! DNA carries a code that controls what every cell in our bodies does.

DNA is made up of two strands, they are twisted together (like a twisted ladder), this shape is called **double helix**.

The two sides are joined together by **bases**. There are four different bases **A** (adenine), **T** (thymine), **C** (cytosine) and **G** (guanine).

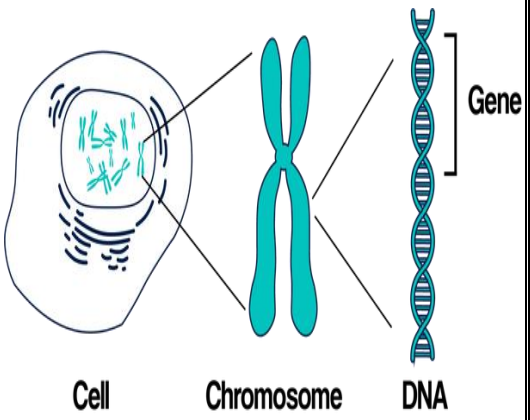
The same bases always match up with each other.

- **A** matches with **T**
- **C** matches with **G**

DNA is very **looooong** so it is wound up in to **chromosomes**.

In humans there are **46 chromosomes** (23 pairs) in each cell in your body. The 23rd pair are called the sex chromosomes.

- A female body has an **XX** 23rd pair of chromosomes
- A male body has an **XY** 23rd pair of chromosomes



EXTRACTING DNA

In class we extracted DNA from a kiwi fruit.

- First the cell wall was removed by mashing the kiwi
- Then the cell membrane was dissolved by mixing the mixture with salt and soap
- The mixture was heated gently to remove the nucleus
- The mixture was then filtered and cooled to separate the DNA

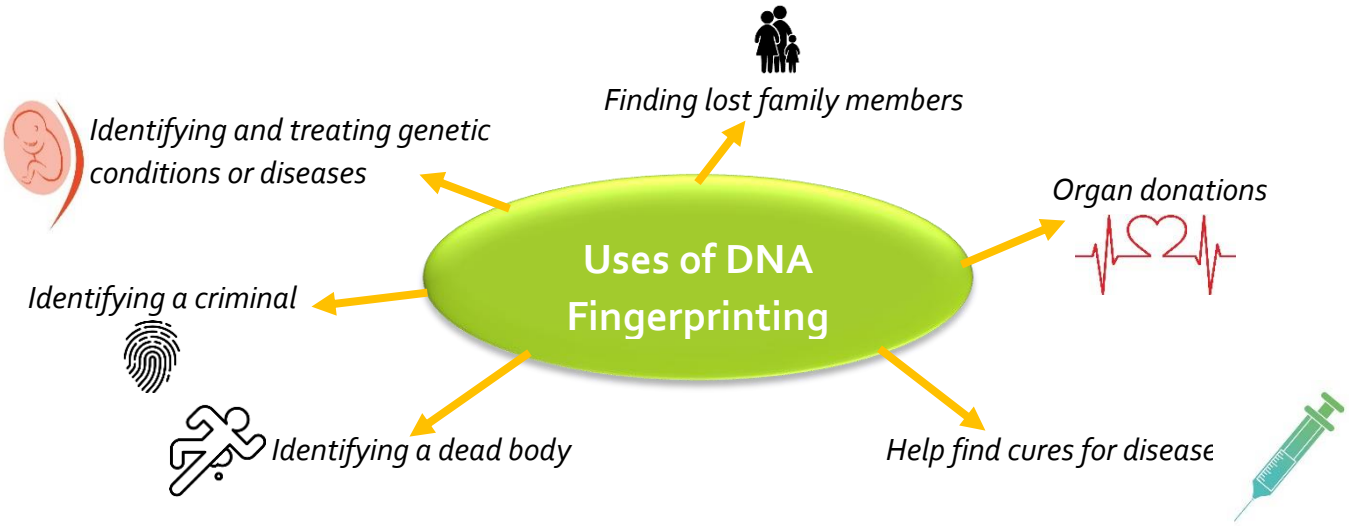
DNA FINGERPRINTING / DNA PROFILING

What is DNA fingerprinting?

Dolly the sheep was the first clone created. She was an exact replica of her mother. Dolly the sheep died young because her cells were still old. You can see Dolly's mother at the National Scotland museum on Chambers St.

DNA fingerprinting was invented in 1984. DNA fingerprinting shows the unique base pairing of an individual. 99% of all human DNA is the same but 1% is different in each of us.

USES OF DNA FINGERPRINTING



PROBLEMS WITH DNA FINGERPRINTING

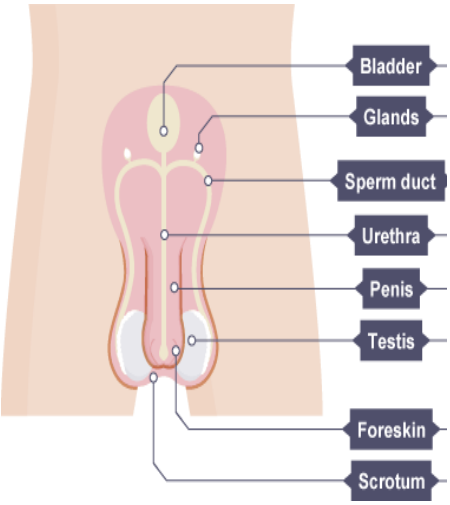
Some people are against fingerprinting because data isn't always stored safely meaning that your DNA could be used against your will. This could be to make you guilty of a crime you didn't do, change your life insurance or credit limit.

DNA profiling can also unfairly target different communities.

MALE & FEMALE REPRODUCTIVE ORGANS

Male Reproductive Organs

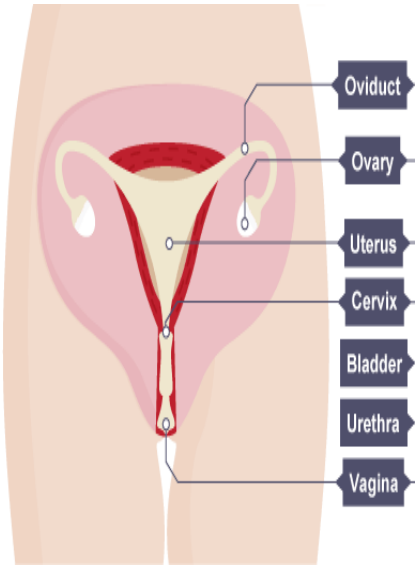
The male reproductive organs are found on the outside of the body.



Part of system	Function
Penis	Inserted in female during intercourse
Sperm duct	Where sperm travel through to leave the male body
Testes	Where sperm are produced
Scrotum	Skin that holds the testes outside of the body
Foreskin	Piece of skin that covers the top of the penis
Urethra	Allows urine to leave the body
Bladder	Where urine is stored
Glands	Produce chemicals to aid the production of sperm

Female Reproductive Organs

The female reproductive organs are found inside the body.

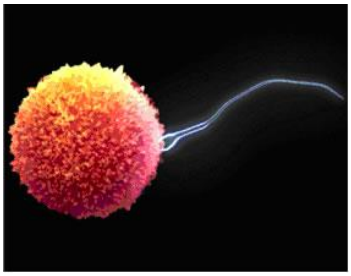


Organ	Function
Vagina	Opening in the body to allow intercourse to happen/baby to come out
Ovary	Where eggs are kept and released once a month
Oviduct	The tube that eggs travel through (fertilisation occurs here).
Womb / Uterus	A fertilised egg will develop here into a baby.
Cervix	A muscle that opens during childbirth to let the baby out
Bladder	Where urine is stored
Urethra	Allows urine to leave the body

FERTILISATION

Definition of fertilisation

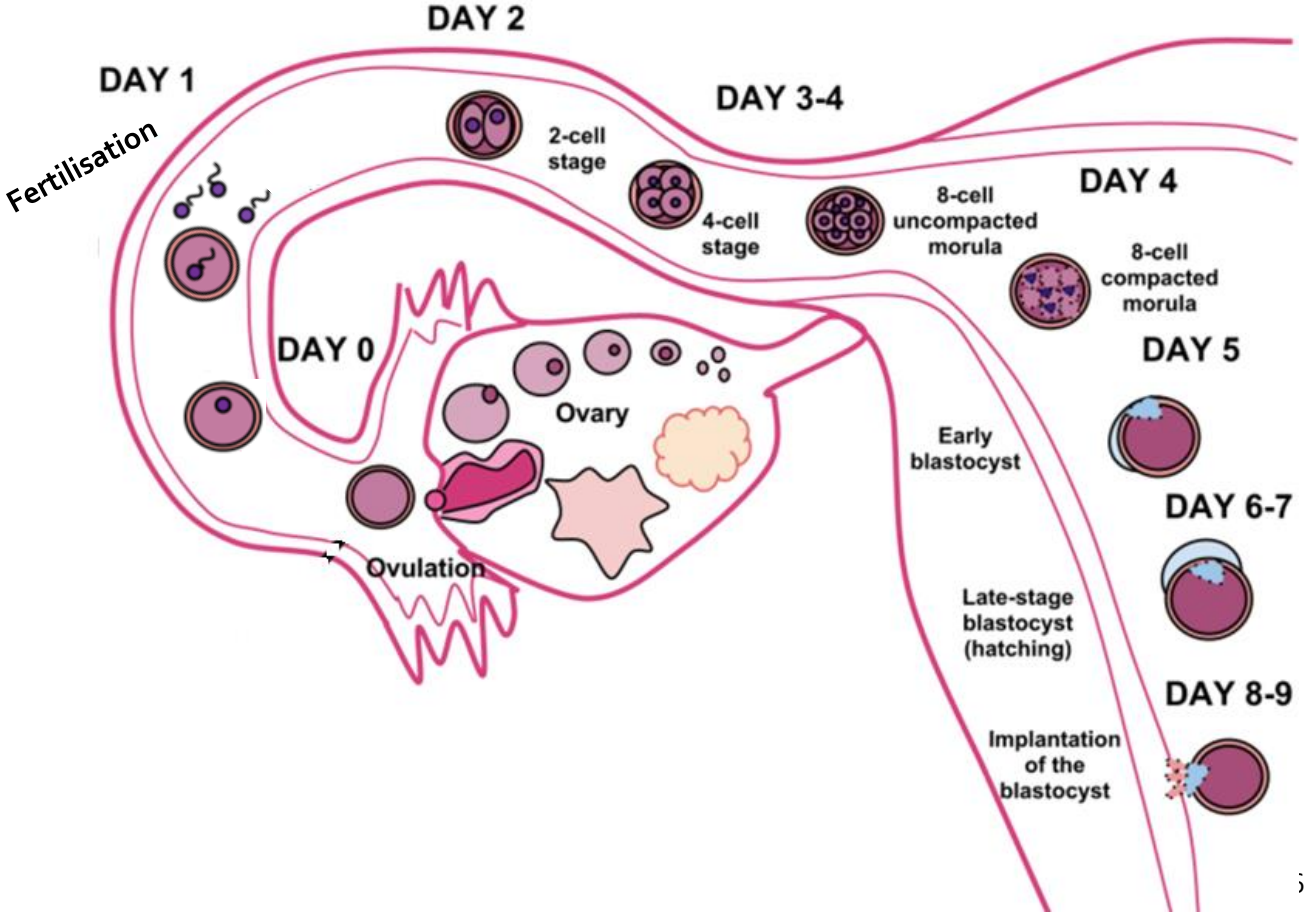
Fertilisation is when the genetic information of the ova (female sex cell) and sperm (male sex cell) join.
This takes place in the oviduct.



Each sex cell contains have the genetic information required, when they join the fertilised egg now has all the genetic information needed to develop into a baby.

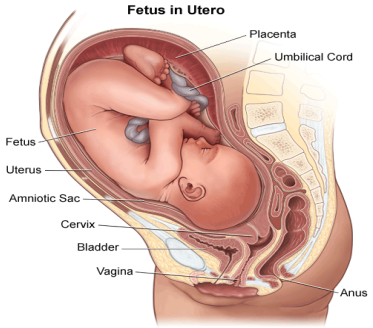
Process of cell division

During ovulation an egg is released from the ovary. If sperm are present both sex cells will meet in the oviduct, when the genetic information of both cells fuse fertilisation has taken place. The new fertilised egg will then begin to divide and divide before implanting to the side of the womb.



BABY IN THE WOMB

How does the foetus develop?



After fertilisation it will take 9 months for the fertilized egg to develop in to a baby ready to be born.

During this time the female body creates a new organ (the placenta) to exchange nutrients and toxins between the mothers body and the foetus.

Organ	Role
Foetus	The unborn baby
Uterus / womb	The area where the foetus will grow
Amniotic fluid	Protects the foetus from bumps
Amniotic sac	Contains the amniotic fluid
Placenta	Allows nutrients and waste to be exchanged between mother and foetus
Cervix	Strong muscle that holds baby in place, contracts (space gets bigger) for birth
Vagina	Opening of the body the foetus will leave through

How can a mother protect her unborn baby?

As well as nutrients, toxins can transfer through the placenta from mother to foetus.

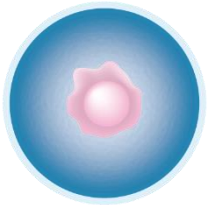
Advice	Reason
Don't drink alcohol	Alcohol can cross to the baby and cause developmental problems
Don't take drugs	Drugs can cross to the baby and cause developmental problems
Eat healthy	Nutrients can help development

INHERITANCE

WHERE DO OUR GENES COME FROM?

We receive half of our genetic information from our mum and half of our genetic information from our dad.

Sperm cell:
23 chromosomes



Egg (ovum) cell:
23 chromosomes

Fertilised cell:
46 chromosomes

A **gene** is a small section of DNA that codes for a part oy your body (for example eye colour).

A **dominant** gene is a strong gene, it is given a capital letter to show this.
A **recessive** gene is a weaker gene, it is given a lower case letter to show this.

Mum has blue eyes

*She has **two recessive** genes*

bb

Dad has brown eyes

*He has **one dominant gene and one recessive gene***

Bb

or

Baby gets one gene from each parent

They could have brown eyes Bb
or they could have blue eyes bb

Mum has brown hair

*She has **two dominant** genes*
HH

Dad has blonde hair

*He has **one dominant gene and one recessive gene***

Hh

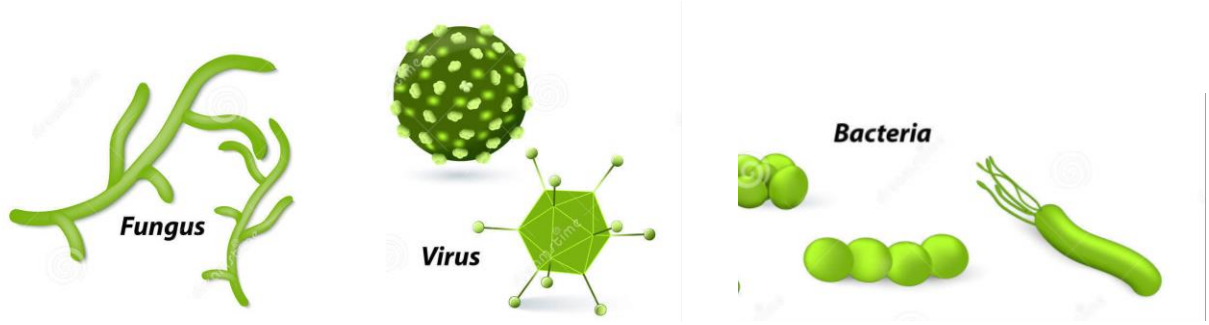
Baby gets one gene from each parent

They will only have brown hair

Either HH or Hh

DEFENCE

WHAT ARE MICROBES?



Microbes are small living creatures. Microbes are so small we can only see them with a microscope!

There are three types of microbe: bacteria, viruses and fungi.

Viruses are the smallest microbe, then bacteria and fungi are the largest.

ARE MICROBES PRESENT?

How can we view microbes?

We can grow microbes on petri dishes that have agar jelly in them. This jelly acts as a nutrient and help the microbes grow.

We simply take a swab (with a cotton bud) from anywhere and gently rub it on a petri dish and then place it in an autoclave (gentle oven) until the microbes have multiplied enough that we can see them.

When microbes have multiplied this much we can view them. Each new colony (circle of microbes) is created by one microbe that was present.

We can now view this under a microscope to view our microbes.

MICROBES

Some microbes are useful.

Some microbes can be useful. We use microbes to make yoghurt, bread and beer.

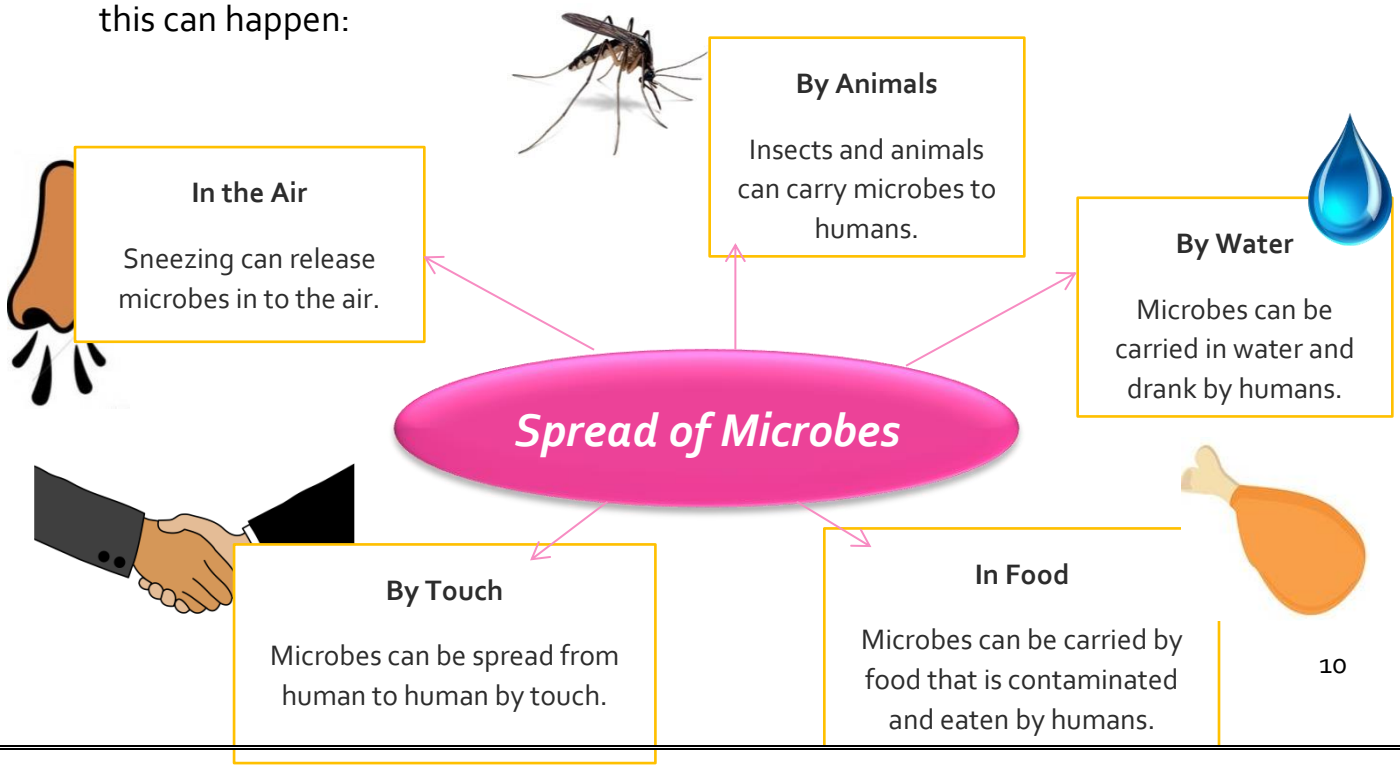
Microbes can cause disease.

Microbes can cause disease when they are able to reproduce in the body. They produce harmful substances called toxins, and damage tissues and organs. We say that someone who has harmful disease-causing microbes in them is infected.

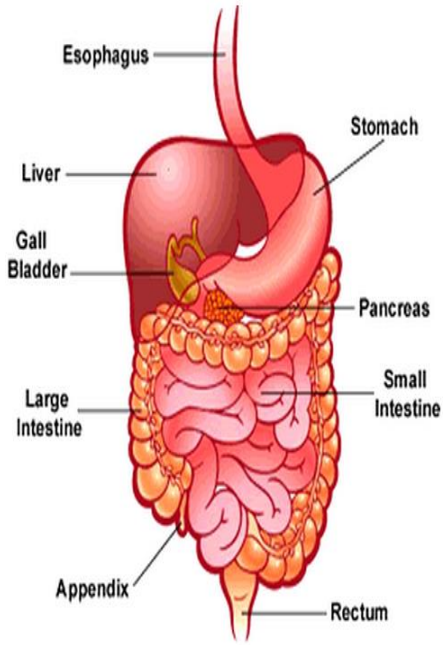
Diseases that can be caused by microbes		
Fungi	***Bacteria***	***Viruses***
Athlete's foot *Thrush*	*Tuberculosis* *Salmonella* *Whooping Cough*	*Chicken pox* *Common cold* *Influenza (flu)* *Measles* *Mumps* *Rubella*

How are microbes spread?

Harmful microbes can be passed from human to human. There are various ways this can happen:



Stopping the spread of microbes – Natural Barriers



Human bodies have many natural barriers to stop the spread of harmful microbes.

- There is strong acid in the stomach that kills many microbes.
- Lungs have a sticky mucus that traps microbes.
- Skin stops microbes getting into the body
- Scabs form to stop microbes getting into cuts
- Tears can kill bacteria
- White blood cells in the immune system can engulf ('swallow') microbes.

Stopping the spread of microbes – what else can we do?

Stopping the spread of microbes

Add chlorine to water to kill bacteria

Treat and dispose of sewage properly

Freeze or refrigerate foods

Use vaccines to build up human resistance to disease and antibiotics to kill bacteria.

Use disinfectant: antiseptics and soaps.