



Stonelaw High School Science Faculty

BGE Science Stonelaw General Practice Summary notes



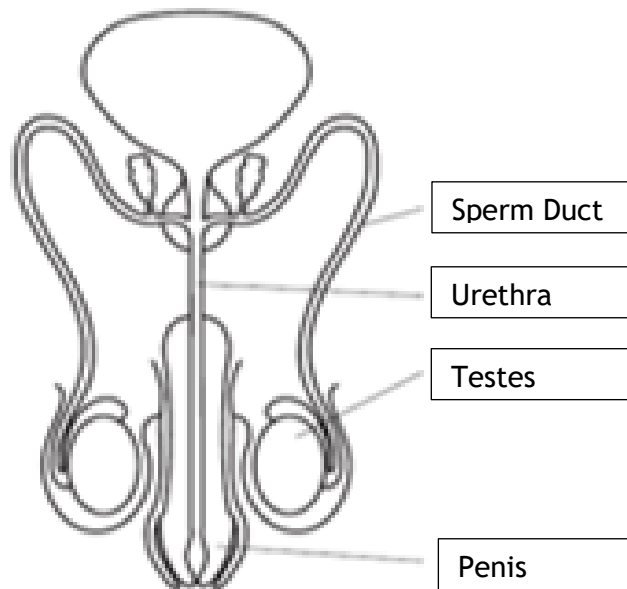
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Reproductive Systems

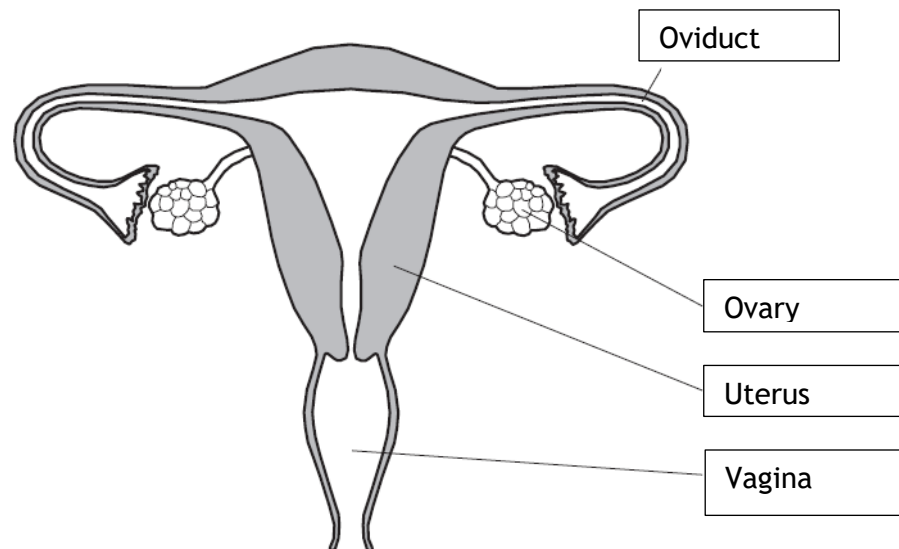
During puberty, hormones are released which cause a child's body to develop and change as they become an adult.

Their reproductive systems will start to produce sex cells to allow them to reproduce.

Male reproductive organ

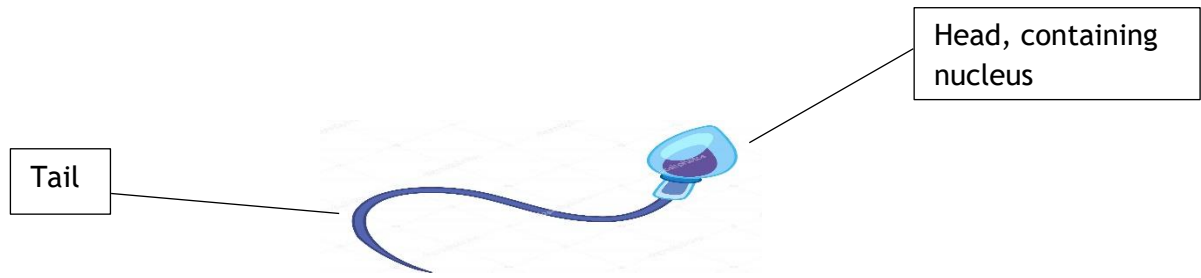


Female reproductive organ



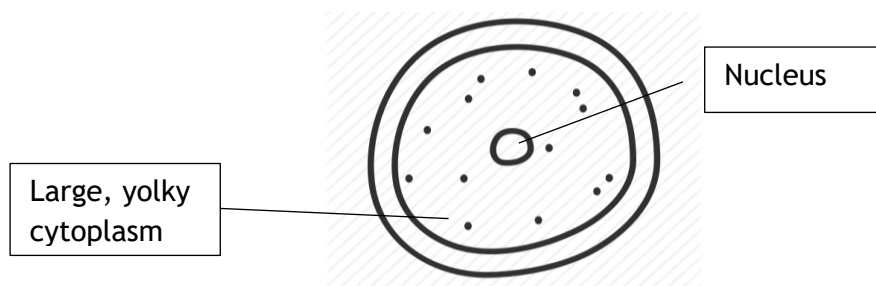
Sex Cells

Sperm



- Sperm is the male sex cell.
- They are made in the testes.
- The nucleus is in the head of the sperm cell and they have a tail to swim to the egg.

Egg



- The egg is the female sex cell.
- They are made in the ovaries.
- Their nucleus is surrounded by a large yolky cytoplasm to provide food to the developing embryo.

Fertilisation

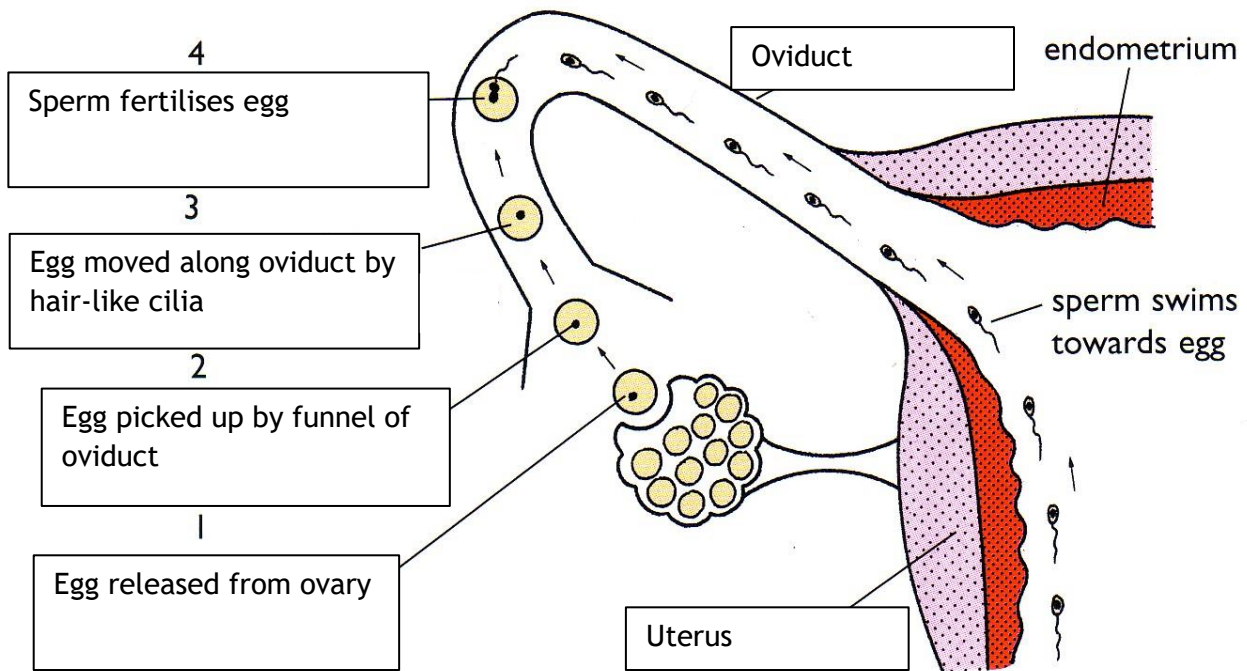
A sex cell contains half the genetic information needed to make a complete individual.

Fertilisation is when the sperm cell joins with the egg cell. This occurs in the oviduct of the female system. The nucleus of the sperm join with the nucleus of the egg cell. This forms a fertilised egg which is called a zygote.

This occurs in the oviduct of the female system.

After fertilisation, the fertilised egg travels along the oviduct and divides to form an embryo. The embryo implants into the wall of the uterus.

Steps of fertilisation



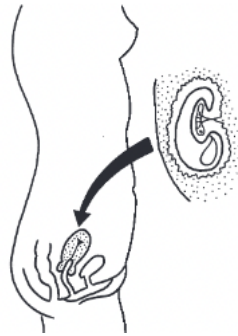
Stages of developing baby

Cut out the information and the diagrams. Try to match each diagram with the correct description.



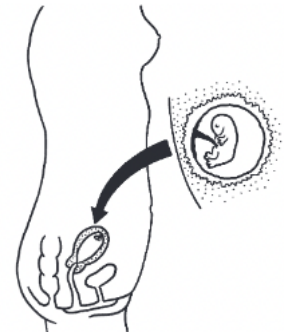
3 weeks

The fertilised egg is dividing rapidly. It has formed a ball of cells. It is too small to be seen without a microscope.



6 weeks

The ball of cells now looks like a tadpole. There is a 'head end' and a 'tail end' and a bulge where the heart is forming.



8 weeks

You can now see the eyes. The arms and legs have formed with tiny fingers and toes. At this stage the baby is called a fetus.



12 weeks

The fetus is about 50 mm long. It can kick its legs and move its fingers. Its head is out of proportion with the rest of its body. Most of the organs inside its body are working.



24 weeks

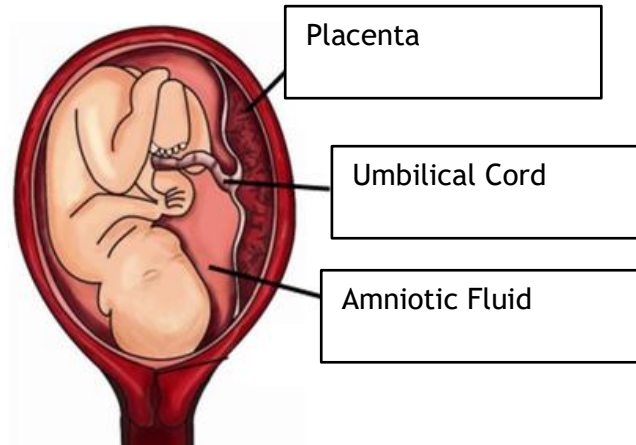
The fetus has grown so much that the mother looks pregnant. She can feel her baby moving inside her. Its heart can be heard beating.



30 weeks

The baby is almost ready to be born. Its head is just above the cervix. When the muscles of the mother's uterus contract, it will be born head first.

Keeping the foetus alive



Part	Function
Placenta	Removes oxygen and food from mother's blood to pass into the foetus through the umbilical cord
Umbilical cord	Connects the foetus to the placenta
Amniotic fluid	Protects the foetus

Risks to the foetus

The placenta can filter out certain molecules and bacteria.

It is unable to stop many harmful substances such as alcohol, chemicals and some types of viruses from reaching the foetus.

<i>Lifestyle choice</i>	<i>Substance which crosses the placenta</i>	<i>Effect on developing embryo</i>	<i>Treatment when baby is born</i>
Smoking	Tobacco	Early birth Low birth weight	Oxygen Support later in life
Alcohol	Alcohol	Early birth Low birth weight Learning difficulties	Medication to remove alcohol Support later in life
Taking Drugs	Heroin	Addiction Low birth weight Early birth	Drug treatment Nurture

Monitoring the health of a foetus

The health and development of the foetus can be monitored using ultrasound imaging.

Ultrasound imaging uses sound waves to produce pictures inside of the body.

Inheritance - Who will the baby look like?

Inherited characteristics are passed from parents to their offspring in genes.

Each person receives one form of a gene from their mother and another from your father.

Inherited Characteristics	Non-inherited characteristics
Hair colour Skin colour Rolling your tongue Not liking certain foods Deafness Left Handed	Chickenpox Being able to read Manners Scars Riding a bike

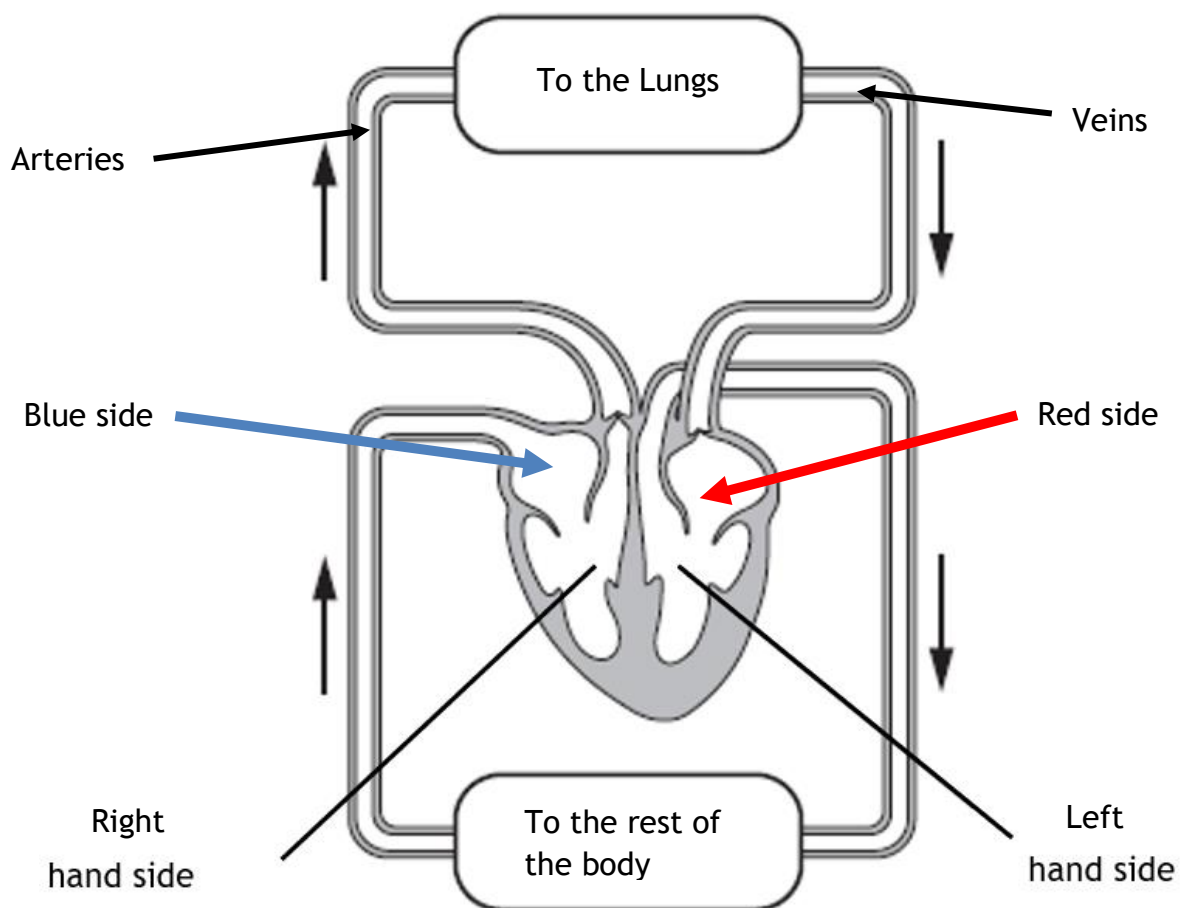
Circulatory System

The circulatory system is made of the heart and blood vessels

The heart is a muscle which pumps blood around the body.

The heart has four chambers.

Blood enters the right-hand side of the heart from the body. This blood is oxygen poor and is pumped to the lungs to pick up oxygen. Blood from the lungs then enters the left-hand side of the heart. This blood is oxygen rich and is pumped around the body.



Red blood cells carry oxygen around the body. Nutrients are also absorbed into your blood and transported around the body.

Blood is carried around the body in structures called Blood vessels. There are three kinds of blood vessels: Arteries, Veins and Capillaries.

Type of blood vessel	Artery	Vein
Walls	Thick	Thin
Valves	No	Yes
Pressure	High	Low
Pulse	Yes	No
Direction of blood	Away from the heart	To the heart

Arteries carry blood away from the heart. Blood in arteries travels at high pressure. The artery has thick muscular walls to withstand the high pressure. A pulse is caused by blood travelling through arteries.

Veins take blood to the heart. Blood travels at low pressure so veins have valves to prevent blood going backwards.

Capillaries are microscopic vessels which connect arteries to veins. They allow substances to be exchanged between blood and body cells and so are only one cell thick.

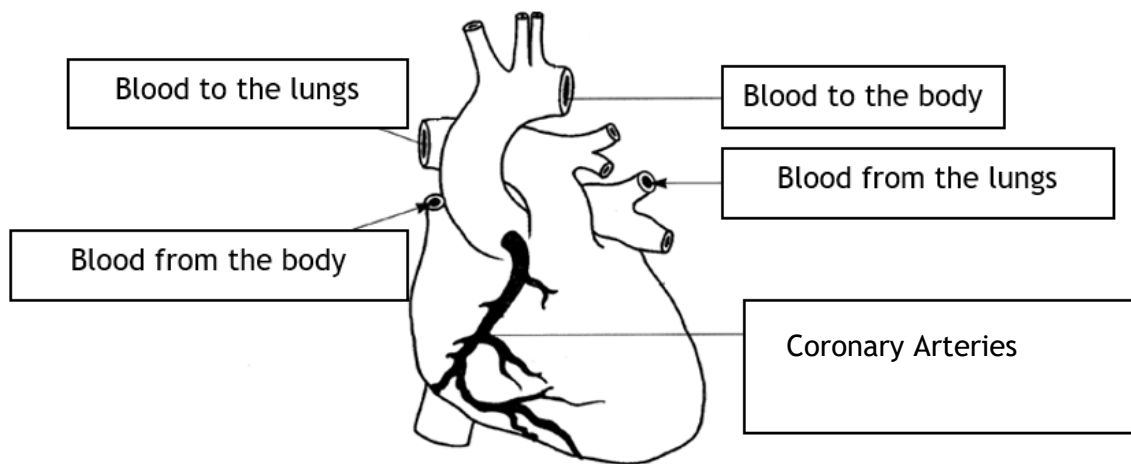
Heart Disease

The coronary arteries supply the heart muscle with oxygen and nutrients needed for it to stay healthy and function normally.

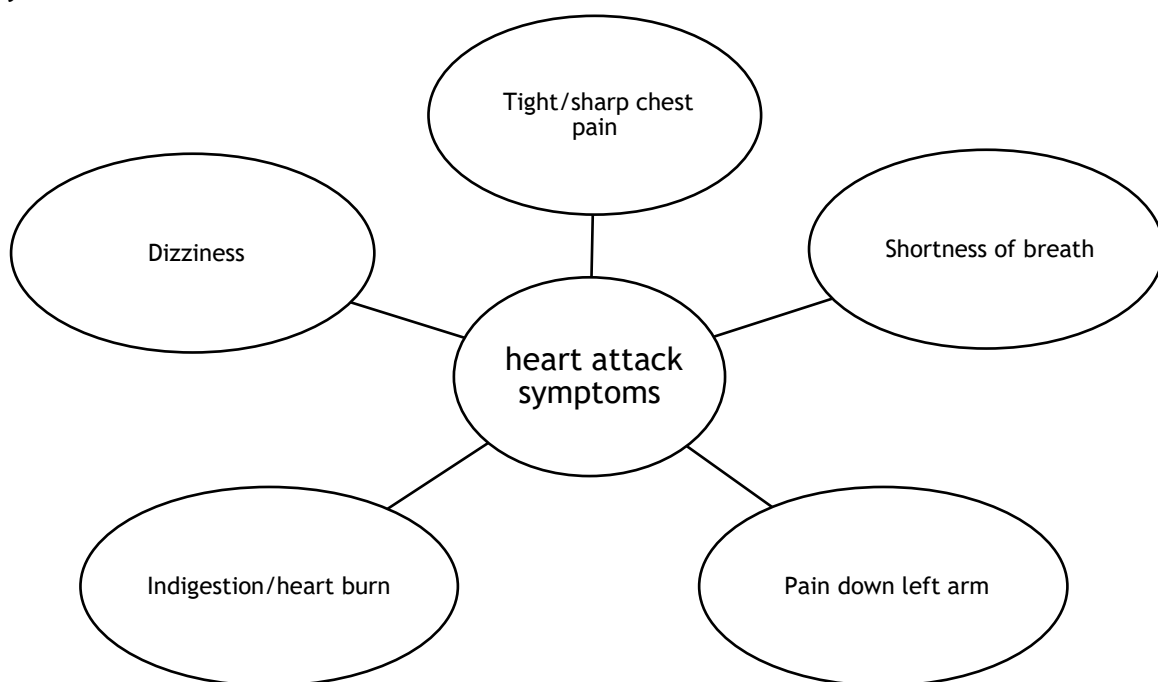
When someone suffers with coronary heart disease, the coronary arteries that supply the heart muscle with blood become narrowed.

Fatty deposits called plaque builds up along the inside of the coronary arteries. This reduces blood flow.

A heart attack occurs when one or more of these coronary arteries becomes blocked completely and blood cannot flow.



Symptoms of a heart attack



Causes of Heart Disease

Some lifestyle choices can increase a person's chances of developing coronary heart disease. There is also evidence that your genes can contribute to your risk of developing coronary heart disease.

Lifestyle choices linked with heart disease are:

- High Salt Diet
- High fat diet
- Lack of exercise
- Excess Alcohol
- Smoking
- Stress

Link between poor lifestyle choices and heart disease

Having a high fat diet and being overweight causes more fatty material to circulate in your blood and increases the chance it will build up inside your arteries.

This causes the arteries to become narrow and can cause high blood pressure.

Ways to record your health

Heart rate is the number of times the heart beats per minute. The average adult heart rate is 60-80 bpm. The stronger the heart muscle, the lower the resting heart rate.

Blood pressure (BP) is the pressure of circulating blood on the walls of blood vessels as it travels around your body.

Recovery rate is measured by calculating the time it takes for their heart rate to return to its resting rate after exercise. The fitter the person, the faster their recovery time

BMI indicates how much body tissue a person has by dividing their weight by their height². A value greater than 30 indicates obesity.

Role of Exercise and Diet in Reducing Risk of Heart Disease

Regular exercise reduces how much fatty material circulates in your blood and reduces your chance of high blood pressure. It also uses more energy from food so less is stored as fat.

Having a balanced diet involves eating a variety of foods from a variety of different food groups. This ensures your body gets all the nutrients it needs to function correctly.

Cell Division and Cancer

The cells in our body divide to help us grow and to replace damaged or dead cells.

Cells normally divide in a controlled way but faults or damage to DNA within cells can cause them to divide uncontrollably forming a tumour.

Lifestyle choices, genetics and environmental factors can increase the chance of these faults or damage occurring.

Increasing Risks of Cancer include:

- Obesity
- Smoking
- Stress
- Poor diet
- Drugs
- Exposure to radiation
- UV damage

Skin Cancer

Ultraviolet (UV) radiation is emitted by the sun and artificial sources, such as tanning beds.

While UV radiation has some benefits for people, including the creation of Vitamin D it also can cause sunburn, premature aging and skin cancer.

When your skin is unprotected from the sun, ultraviolet (UV) radiation can damage your DNA.

The more often the DNA is damaged, the harder it is to repair, increasing the chance of the cell becoming cancerous and dividing uncontrollably to form a tumour.

Suncreams work by reducing or blocking UV damage to our skin.

Cancer Treatment

Oncologists are doctors who treat cancer. They use three main kinds of treatments.

Treatment	Advantage	Disadvantage
Chemotherapy	Chemotherapy is a type of treatment where patients are given chemicals that kill fast-growing cells. Chemotherapy medicine targets fast growing cells like those found in cancerous tumours.	Unfortunately, other healthy cells that grow quickly, such as hair follicles and cells that line the stomach are also affected by this medicine, causing hair loss and sickness.
Radiation	In radiation therapy uses high-energy electromagnetic waves such as x-rays and gamma rays. The radiation is specifically focused on the tumour so that the high-energy waves kill the cancer cells.	Radiation can damage other tissue around the tumour and there is a limit to the amount of radiation an area of your body can safely receive.
Surgery	Surgery removes the tumours by cutting them out of the body.	Sometimes a tumour is hard to tell apart from healthy tissue and so some cancer cells can be left behind and the tumour can regrow.

Infection

Infectious diseases are caused by microorganisms such as viruses, bacteria, and fungi.

Common diseases

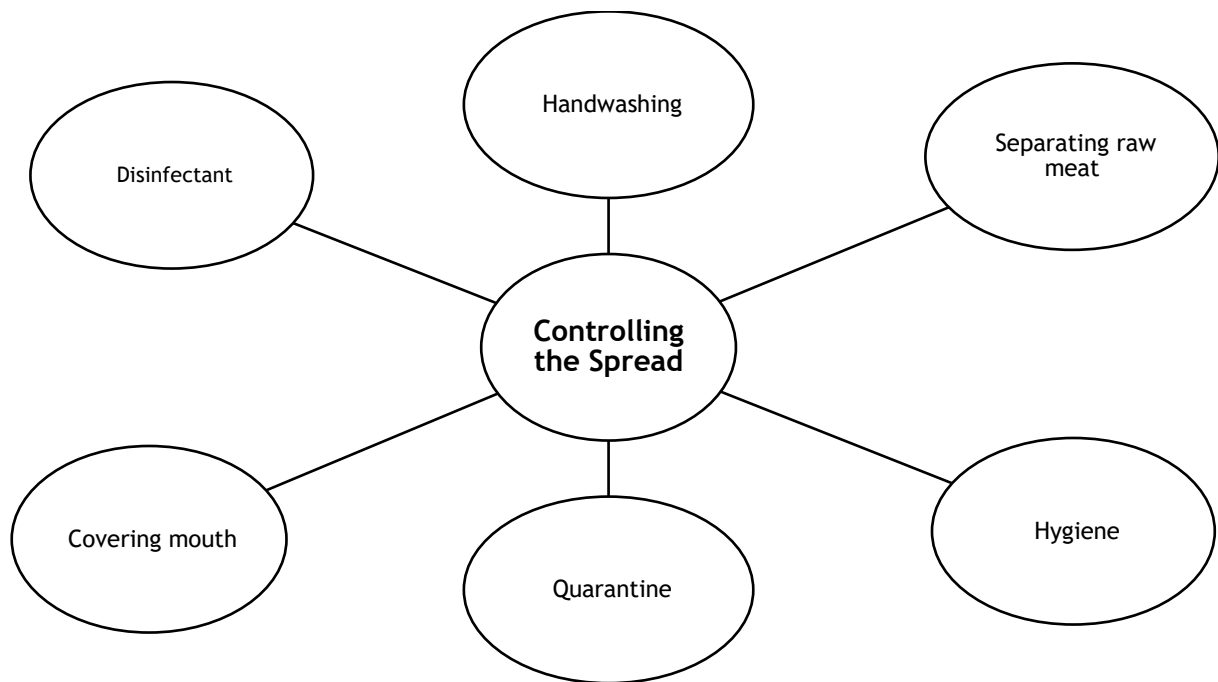
Bacteria	Virus	Fungi
E Coli	Tetanus	Ringworm
Chlamydia	Influenza	Candidiasis
Tuberculosis	Measles	Athlete's foot
Streptococcus	Mumps	
	Rabies	
	Chickenpox	

Spread of Infection

Infectious diseases can be spread from one person to another in a variety of ways:

- Contaminated water
- Undercooked/out of date food
- Body fluids such as blood, saliva, semen
- Inhaled air
- Direct physical contact
- Vector organisms (such as mosquitos)

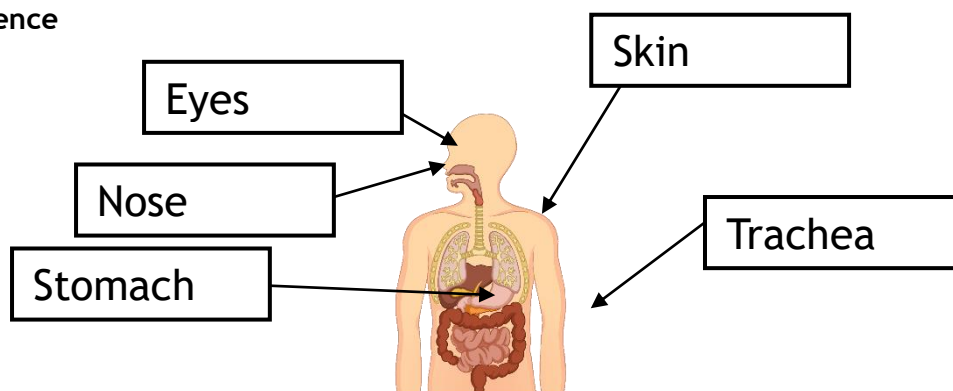
Controlling the Spread of Infection



Immune System

The immune system defends our body against invading pathogens. A pathogen is a microorganism such as a virus or bacteria which can cause disease.

First line of defence



Second line of defence

If the skin gets damaged, pathogens can enter the blood stream.

White blood cells called phagocytes recognise foreign cells and move towards them.

Phagocytes then engulfs pathogens and digests them using enzymes.



Third line of defence

Pathogens contain unique proteins on their surface called antigens. When white blood cells detect these antigens, they produce antibodies.

Antibodies bind to the antigens and deactivate the pathogen.

Antibiotics

Antibiotics are medicines used to treat infections caused by bacteria. They do not work on viral infections. Different antibiotics are given for different infections.

Vaccines

Vaccines are injection which contain dead, inactive or parts of a virus. When injected into the body, they cause white blood cells to produce antibiotics which destroy the virus. These antibodies remain in the body and protect us against a live form of the microorganism.

Read each statement and complete the flow chart to show how vaccines work

