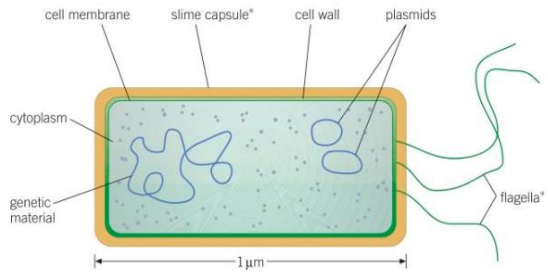
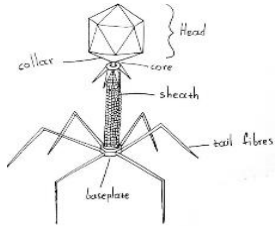
Communicable disease	Infectious diseases that can be passed from person to person. Caused by pathogens e.g. measles
Non-communicable disease	Cannot be transmitted from one person to another e.g. arthritis.
Pathogen	Microorganisms that enter the body and cause disease. Spread in water, air and direct contact.

Topic B3- Infection and Response

Bacteria Reproduce rapidly. Produce toxins to make you feel ill. Damage your cells and tissues.	
Virus Lives and replicates within body cells. Once inside cells make copies and then the cell bursts releasing new viruses. It is difficult to kill viruses without damaging body cells.	

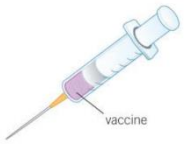
Disease	Pathogen	How it is spread	Effect/symptoms	Prevention/control
Salmonella	Bacteria	Infected foods.	Fever, stomach cramps, vomiting and diarrhoea.	Vaccination of poultry .
Gonorrhoea	Bacteria	Sexual contact.	Pain when urinating, thick yellow or green discharge from the vagina or the penis.	Controlled by antibiotics. Spread prevented by using condoms.
Measles	Virus	Droplets from an infected person's sneeze or cough.	Red skin rash, fever. If complications occur measles can be fatal.	Vaccination.
HIV	Virus	Sexual contact or exchanging body fluids.	Flu-like symptoms. Leading to the virus attacking the immune system.	Antiretroviral drugs
Tobacco Mosaic Virus	Virus	Direct contact.	Discoloration of leaves leading to a mosaic pattern. The leaves have less chlorophyll to absorb sunlight which reduces photosynthesis.	
Rose Black Spot	Fungus	Spores carried by water or wind.	Purple and black spots on the leaves. Leaves then turn yellow and fall off, reducing photosynthesis.	Use fungicides, strip off the affected leaves and destroy.
Malaria	Protist	Mosquitoes are the vectors which spread malaria.	Repeated episodes of fever, can be fatal.	Spread can be reduced by preventing mosquitoes from breeding and using mosquito nets.

Non-specific body defences	
The skin	Physical barrier which stops pathogens from getting in.
Nose hairs	They trap particles that could contain pathogens.
Mucus	The trachea and bronchi release mucus to trap pathogens.
Cilia	The trachea and bronchi are lined with cilia which move the mucus up to the back of the throat where it can be swallowed.
Stomach acid	The stomach makes hydrochloric acid to destroy pathogens.

Antibodies	Produced by white blood cells called lymphocytes. These bind to pathogens and destroy them or stick them together.
Antitoxins	Produced by white blood cells called lymphocytes. Antitoxins neutralise toxins.
Antibiotics	Antibiotics kill bacteria. Specific antibiotics kill specific bacteria. Some bacteria have become resistant to certain antibiotics.
Painkillers	No effect on the pathogens but do reduce the symptoms of the illness. Paracetamols and aspirins are examples of painkillers.
Phagocytosis	Some white blood cells called phagocytes engulf pathogens.
Penicillin	An antibiotic produced by Penicillium. Kills bacteria.

Vaccinations

1-Dead or inactive pathogen is injected into the patient.
2-The antigens on the surface of the pathogen cause white blood cells to produce a specific antibody to attack the pathogen.
3-If the person is infected again with the same pathogen, white blood cells quickly produce the specific antibodies.
4-The antibodies quickly destroy the pathogen so that the person does not get ill.

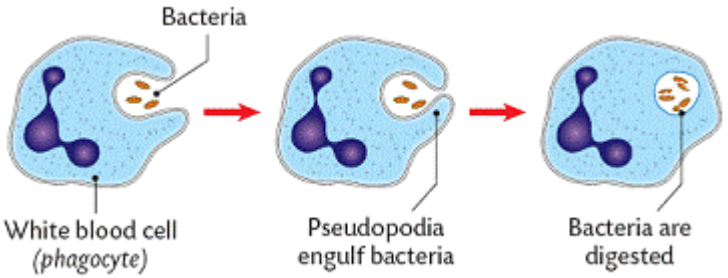
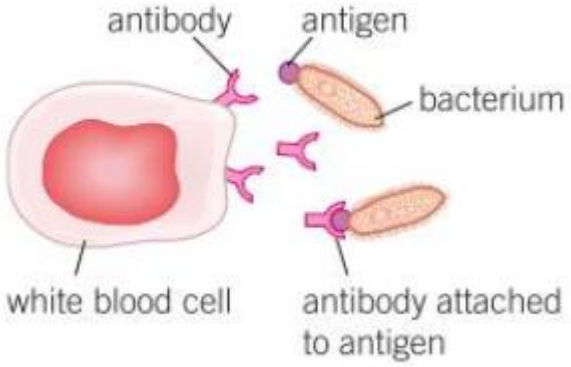


Drug testing		
Trial stage	**Procedure**	**Purpose**
Preclinical testing	Drugs are first tested on human cells and tissues. Followed by testing on animals.	Test for efficacy, toxicity and dosage.
Clinical testing	Tested on human volunteers. Firstly on healthy volunteers.	To make sure that the drug does not have any harmful side effects.
	Secondly- if results are good it is tested on people who have the illness. Small sample group.	To find the optimum dosage and to see how the illness response to the drug.
	Next patients are divided into two groups. Group 1 is given the new drug, group 2 is given a placebo. The clinical trial is 'blind' or even 'double blind'.	To see if the drug makes a real difference. To avoid bias.
	The results of these tests are not published until they have been through a peer review.	To avoid bias and false claims.

Pros and cons of vaccinations

Pro- vaccines help to control lots of communicable diseases.
Pro- Epidemics can be prevented if lots of people are vaccinated.
Con- Vaccines don't always work
Con-Sometimes people have bad reactions to vaccines.

Efficacy	Whether a drug works and has the desired effect.	**Dosage**	The concentration of the drug that works the best and how often it should be taken by the patient.
Toxicity	How harmful the drug is and whether it has any side effects.	**Placebo**	A drug with no active ingredients, designed to mimic a real drug. Used to test if the effects of a drug on a patient are just psychological.
Blind test	The patient doesn't know if they are taking the new drug or a placebo.	**Double blind test**	Neither the patient nor the doctor know if they are taking the new drug or the placebo.

White blood cells		
Phagocytosis	The white blood cells engulf the pathogen.	
Produce antibodies	Invading pathogens have molecules called antigens on their surface which white blood cells do not recognise. Certain white blood cells called lymphocytes produce specific antibodies. These antibodies lock on to the pathogens antigens. The antibodies ensure that the pathogens can be found and destroyed by other white blood cells.	
Produce antitoxins	Certain white blood cells make antitoxins to neutralise the toxins made by pathogens.