

BIOLOGY – YEAR 10 – COMMUNICABLE DISEASES

A PATHOGENS + THEIR DISEASES		
1	Pathogen	Microorganisms that cause infectious disease, e.g. bacteria, viruses, fungi and protists.
2	Bacteria	Reproduce rapidly inside our body. Release toxins. Can be treated by antibiotics.
3	Bacteria Diseases Salmonella (1)	Food poisoning from bacteria on unhygienic food. Causes fever, stomach cramps, vomiting + diarrhoea.
4	Bacteria Diseases Gonorrhoea (2)	An STD. Causes a thick yellow/green discharge from vagina/penis + pain on urination. Treat with antibiotics.
5	Viruses	Reproduce rapidly inside our body. Live + reproduce inside body cells, destroying them.
6	Viral Diseases Measles (1)	Spread by inhaling droplets from coughs + sneezes. Causes fever and red skin rash. Vaccine available.
7	Viral Diseases HIV (2)	Spread by sexual contact or exchange of bodily fluid eg blood. Causes initially flu-like symptoms. Immune system becomes badly damaged. Disease is slowed by retroviral drugs.

8	Viral Diseases TMV (3)	TMV (tobacco Mosaic model) a plant pathogen. Mosaic pattern on leaf affecting photosynthesis + so plant growth.
9	Fungi Disease Black Rose Spot (1)	Spread by water + wind. Black/purple spots on leaves affecting photosynthesis and so plant growth. Use fungicides/remove affected leaves.
10	Protist Disease Malaria (1)	Spread by mosquitoes. Protist is part of the life cycle of a mosquito. Causes fever and possibly death. Use mosquito nets.

B NATURAL DEFENCE SYSTEMS		
1	Non Specific Immune Response	Body destroying any pathogen. Skin (physical barrier) Nose (hairs) Trachea + bronchi (mucus and cilia) Stomach (hydrochloric acid)
2	White Blood Cells	Work in 3 ways <ul style="list-style-type: none"> • Phagocytosis (engulf any pathogen) • Make specific antibodies (to destroy a specific pathogen) • Make specific antitoxins (to destroy a bacteria's specific toxin)

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C VACCINATIONS		
1	Vaccine Contents	Small quantity of dead/inactive pathogen
2	How Vaccine Works	White blood Cells stimulated to make the correct antibodies. If in contact with the same pathogen in the future, white blood cells respond quicker to make the correct antibody. With a large proportion of the population vaccinated it reduces the spread of the disease.

D ANTIBIOTICS AND PAINKILLERS		
1	Antibiotics	Destroy bacteria only. Do NOT destroy viruses. Example penicillin.
2	Antibiotic Resistant Bacteria	Bacteria evolve to become resistant to antibiotics. These bacteria are called resistant strains.
3	Painkillers	Treat symptoms. Do NOT kill the pathogen Example paracetamol

E DISCOVERY + DEVELOPMENT OF DRUGS		
1	Drug Origins	Traditionally drugs are extracted from plants and microbes.
2	Drug Origin Examples	Digitalis (heart drug) – from foxgloves Aspirin (painkiller) – from willow tree bark Penicillin (antibiotic) – from mould. Discovered by the Scientist Alexander Fleming.
3	Making a New Drug 1. Pre Clinical	Testing NOT carried out on humans yet. Testing on cells, tissues, organs and animals. Checking safety.
4	Making a New Drug 2. Clinical	Testing on humans 1. Test on healthy volunteers – low dose to check safety (toxicity) and side effects. 2. Test on patients – to check optimum dose and to check if the drug actually works (efficacy).
5	Double Blind	During clinical stage of drug testing. Half of the patients in the trial will be given the drug and half given a placebo. BOTH patients and doctors do not know who has the drug or the placebo. Reduced bias.
6	Placebo	Drug without the active ingredients.