



Separate Science - Biology
Learning Journey – B3 Infection and Response

Ad Astra 

What have I done previously in my learning journey?			
Previously....	You have learnt previously about reproduction. This has involved: <ul style="list-style-type: none"> The structure and function of different cells The importance of bacteria in the human digestive system 		
In this topic...	You will learn that pathogens are microorganisms such as viruses and bacteria that cause infectious diseases in animals and plants. They depend on their host to provide the conditions and nutrients that they need to grow and reproduce. They frequently produce toxins that damage tissues and make us feel ill. This section will explore how we can avoid diseases by reducing contact with them, as well as how the body uses barriers against pathogens. Once inside the body our immune system is triggered which is usually strong enough to destroy the pathogen and prevent disease. When at risk from unusual or dangerous diseases our body's natural system can be enhanced using vaccination. Since the 1940s a range of antibiotics have been developed which have proved successful against a number of lethal diseases caused by bacteria. Unfortunately, many groups of bacteria have now become resistant to these antibiotics. The race is now on to develop a new set of antibiotics.		
We will develop our learning by studying the following each lesson:			RAG
B3.01 Communicable Diseases			Skills in Science checklist
<ul style="list-style-type: none"> Explain what a pathogen is and how pathogens are spread Explain how the spread of diseases can be reduced or prevented 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
B3.02 Bacterial, Viral Diseases, Fungal and Protist Diseases			Skills in Science checklist
<ul style="list-style-type: none"> Explain how pathogenic bacteria and viruses cause damage in the body Describe salmonella food poisoning and gonorrhoea as examples of bacterial pathogens Describe measles, HIV and tobacco mosaic virus as examples of viral pathogens Describe the signs, transmission and treatment of rose black spot infection in plants as an example of fungal pathogens Describe the symptoms, transmission and control of malaria, including knowledge of the mosquito vector as an example of a protist pathogen 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
B3.03 Fighting Diseases			Skills in Science checklist
<ul style="list-style-type: none"> Describe defences that stop pathogens entering the human body (inc skin, nose, trachea & windpipe, stomach) Recall the role of the immune system Describe how white blood cells destroy pathogens 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
B3.04 Vaccines			Skills in Science checklist
<ul style="list-style-type: none"> Describe how vaccination works, including at the population level 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
B3.05 Drugs			Skills in Science checklist
<ul style="list-style-type: none"> Explain how antibiotics and painkillers are used to treat diseases, including their limitations Describe how sources for drugs have changed over time and give some examples 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
B3.06 Developing Drugs			Skills in Science checklist
<ul style="list-style-type: none"> Describe how new drugs are tested, including pre-clinical testing and clinical trials (inc double blind trials and placebos) 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
B3.07 Monoclonal Antibodies (Biology Only)			Skills in Science checklist
<ul style="list-style-type: none"> Describe what monoclonal antibodies are and why they are useful Describe how monoclonal antibodies are produced Explain how monoclonal antibodies are used for diagnosis, research, chemical testing and disease treatments Evaluate the advantages and disadvantages of monoclonal antibodies (inc side effects) 			<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication



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B3.08 Plant pathogens (Biology Only) <ul style="list-style-type: none"> Describe some observable signs of plant disease, and how plant diseases can be identified Give examples of plant pathogens Give examples of plant ion deficiencies and their effects Describe physical, chemical and mechanical defence responses of plants 	<ul style="list-style-type: none"> Scientific methods Practical Number skills Application Communication
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Key Vocabulary

Communicable	Pathogen	Bacteria	Virus	Fungus	Protist	Toxin	Measles	HIV
Tobacco mosaic virus	Salmonella	Gonorrhoea	Rose Black Spot	Malaria	White blood cells	Phagocytosis	Antibody	Antitoxin
Vaccination	Antibiotic	Penicillin	Resistance	Painkiller	Digitalis	Aspirin	Penicillin	Trial
Toxicity	Efficacy	Dose	Placebo	Monoclonal antibody	Ion deficiency	Physical defence	Chemical defence	Mechanical defence

Future Learning	Studies at A-Level Biology involves further study of prokaryotic and eukaryotic cells and their ultrastructures. The role of microorganisms in the recycling of chemical elements.
In careers	<p>As antibiotic resistance becomes more of an issue in treating bacterial infections, the race is on to discover new medicines. Microbiologists work to develop new medicines to ensure that diseases can be treated and cured.</p> <p>Microbiologist - £25,200 Senior Microbiologist - £31,300 Microbiology Technologist - £20,300 Clinical Microbiology Laboratory Technologist - £28,500</p>