

# Module Map

Ideas about Science		Module story	Science Explanations	
<i>In other modules</i>	<i>In this module</i>		<i>In this module</i>	<i>In other modules</i>
		<b>How do our bodies resist infection?</b>	The body's natural barriers to microorganisms. Rapid reproduction leads to symptoms. The immune system, including white blood cells, defends the body from disease. White blood cells may ingest microorganisms or produce antibodies.	Diagnosis and treatment of illness in A1 <i>Life care</i> .
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<b>IaS5:</b> Risk.	Like any activity, including medical treatments, vaccination can never be completely safe.	<b>What are vaccines?</b>	Vaccines contain a usually safe form of disease-causing microorganism. They establish antibodies before infection. <b>The importance of vaccinating a high percentage of the population.</b>	
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<b>IaS6:</b> Making decisions about science and technology in B2 <i>Keeping healthy</i> , C2 <i>Material choices</i> , C3 <i>Food matters</i> , P3 <i>Radioactive materials</i> .	Vaccinations may provide difficult decisions for individuals, and vaccination policy raises ethical issues for society. Different views may be held. <b>Distinguishing technical feasibility from values. Different courses of action may be taken in different social and environmental contexts.</b>	<b>Why do new vaccines need to be produced for some diseases?</b>	The need to produce new vaccines against influenza regularly. <b>The influenza virus and HIV have high mutation rates. HIV also damages the immune system. It is thus difficult to develop an effective vaccine.</b>	Mutation is explained in B3 <i>Life on Earth</i> . DNA structure in B4 <i>Growth and development</i> .
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		<b>What are antibiotics?</b>	Antibiotics are chemicals that kill bacteria and fungi. Microorganisms may become resistant to antibiotics ( <b>random mutations</b> ). Actions of individuals can slow development of antibiotic resistance.	Natural selection is introduced in B3 <i>Life on Earth</i> . Antibiotic production in A2 <i>Agriculture and food</i> .
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		<b>How are new drugs developed and tested?</b>	Methods for testing new drugs for safety and effectiveness, and <b>'blind' and 'double-blind' methodology for human trials.</b>	
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		<b>What is heart disease?</b>	The requirement for heart muscle to have its own blood supply. The blocking of coronary arteries by fatty deposits.	
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<b>IaS2:</b> Correlation and cause. <b>IaS4:</b> Scientific community.	Ideas of correlation and cause. Factors may increase the chance of an outcome, but not lead to it. Evaluation of studies to determine cause of disease. The importance of peer review and replication.	<b>What factors increase the risk of heart disease, and how do we know this?</b>	Heart disease is usually caused by lifestyle factors.	