

B6 Preventing and Treating Disease

| Lessons TBAT  | Key Knowledge  | Practical | Assessment       |
|---|--|-----------|------------------|
| TBAT: Explain how vaccination works                   | Students should be able to explain how vaccination will prevent illness in an individual, and how the spread of pathogens can be reduced by immunising a large proportion of the population.   | N/A       | End of unit test |
| TBAT: Explain when to use antibiotics and painkillers | Vaccination involves introducing small quantities of dead or inactive forms of a pathogen into the body to stimulate the white blood cells to produce antibodies. If the same pathogen re-enters the body the white blood cells respond quickly to produce the correct antibodies, preventing infection. Students do not need to know details of vaccination schedules and side effects associated with specific vaccines. |           | Maths focus      |
| TBAT: Explain where drugs are derived from            | Students should be able to explain the use of antibiotics and other medicines in treating disease. Antibiotics, such as penicillin, are medicines that help to cure bacterial disease by killing infective bacteria inside the body. It is important that specific bacteria should be treated by specific antibiotics.   |           |                  |
| TBAT: Describe the process of drug testing            |  |           |                  |

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|  | <p>The use of antibiotics has greatly reduced deaths from infectious bacterial diseases. However, the emergence of strains resistant to antibiotics is of great concern.</p> <p>Antibiotics cannot kill viral pathogens. Painkillers and other medicines are used to treat the symptoms of disease but do not kill pathogens. It is difficult to develop drugs that kill viruses without also damaging the body's tissues.</p> <p>Students should be able to describe the process of discovery and development of potential new medicines, including preclinical and clinical testing. Traditionally drugs were extracted from plants and microorganisms. • The heart drug digitalis originates from foxgloves. • The painkiller aspirin originates from willow. • Penicillin was discovered by Alexander Fleming from the Penicillium mould. Most new drugs are synthesised by chemists in the pharmaceutical industry. However, the starting point may still be a chemical extracted from a plant</p> <p>New medical drugs have to be tested and trialled before being used to check that they are safe and effective. New drugs are extensively tested for toxicity, efficacy and dose. Preclinical testing is done in a laboratory using cells, tissues and live animals. Clinical trials use healthy volunteers and patients. • Very low doses of the drug are given at the start of the clinical trial. • If the drug is found to be safe, further clinical trials are carried out to find the optimum dose for the drug. • In double blind trials, some patients are given a placebo.</p> | <p>Key stage 3</p> <p>Links to unicellular organisms, with a particular focus on bacterial and viral cells and fungal cells.</p> <p>The structure of bacterial cells needs to be understood in detail from KS3.</p> <p>Links to treatments for pathogens is to be recalled.</p> |
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