

Section 1.1: Keeping Healthy

Diet and Metabolic Rate

- That for good health, you need a balanced diet — this provides the energy you need (but not more), as well as the right balance of nutrients.
 - That carbohydrates and fats are needed by the body to provide energy and that proteins are needed for growth, cell repair and cell replacement.
 - That the body needs tiny amounts of vitamins and mineral ions to keep healthy.
 - That your metabolic rate is the speed at which the chemical reactions in your body occur.
 - How things like muscle mass and exercise habits affect resting metabolic rate.
 - That the more exercise you do, the more energy you use.
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Factors Affecting Health

- That you can become malnourished by eating an unbalanced diet and that malnourished people can be underweight or overweight.
 - That an unbalanced diet can lead to obesity, which increases your risk of type 2 diabetes.
 - That an unbalanced diet can result in a lack of vitamins or minerals, which can cause deficiency diseases.
 - That exercise keeps you healthy by increasing the amount of energy used by the body and decreasing the amount stored as fat.
 - That inherited factors can affect your metabolic rate, overall health and blood cholesterol level.
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Evaluating Food, Lifestyle and Diet

- How to evaluate information about how food and lifestyle affect health, and how lifestyle affects disease.
 - That to lose weight you need to take in less energy than you use up, so you need to eat less or exercise more.
 - How to evaluate claims made about slimming products.
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Fighting Disease

- That pathogens are microorganisms that enter the body and cause disease, e.g. bacteria and viruses.
 - That bacteria make you feel ill by producing toxins and causing cell damage, and that viruses make you feel ill through cell damage.
 - How the body defends itself against pathogen entry (e.g. through the skin and respiratory tract).
 - How white blood cells help to defend the body against pathogens — by engulfing pathogens, producing antitoxins and producing antibodies.
 - That antibodies only lock onto and kill specific pathogens.
 - How the production of antibodies leads to immunity — if you're infected with a pathogen for a second time, white blood cells will rapidly produce antibodies to kill it and you won't get ill.
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Fighting Disease — Vaccination

- How vaccinations work — dead or inactive pathogens are used to trigger the production of antibodies by white blood cells.
 - That the MMR vaccine is given to children to protect them against measles, mumps and rubella.
 - That if enough people are immune to a particular pathogen, it can reduce the spread of the pathogen, preventing an epidemic.
 - The pros and cons of vaccinations and how to evaluate them.
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Fighting Disease — Drugs

- That drugs (such as painkillers) reduce the symptoms of a disease, but don't kill pathogens.

- That antibiotics (such as penicillin) are drugs that kill the bacteria which cause infectious diseases.
- That antibiotics are specific, so it's important to be treated with the right one.
- That antibiotics don't destroy viruses.
- That viruses reproduce inside body cells, making it difficult to develop drugs against them.
- That bacteria can mutate, leading to the development of antibiotic resistance by natural selection and that MRSA is an example of a strain of antibiotic-resistant bacteria.
- H How populations of antibiotic-resistant bacteria develop — when you treat an infection, only resistant bacteria will survive and reproduce, increasing the population of the resistant strain.
- That to prevent antibiotic resistance spreading, it's important not to over-use antibiotics.
- H That doctors won't usually prescribe antibiotics for a mild infection, e.g. a sore throat.

Fighting Disease — Investigating Antibiotic Action

- That the effectiveness of antibiotics and disinfectants can be tested by growing cultures in the lab.
- How to prevent the contamination of bacterial cultures — by passing inoculating loops through a flame to sterilise them, by sterilising Petri dishes and culture media, and by taping lids onto Petri dishes.
- Why bacterial cultures are kept at 25 °C in schools, but at higher temperatures in industry.

Fighting Disease — Past & Future

- How Semmelweis reduced deaths from infectious disease through hand-washing and how this still applies in modern hospitals.
- That increased understanding of immunity and antibiotic action has changed how we treat disease.
- That antibiotics have reduced deaths from bacterial diseases such as pneumonia.
- Why antibiotic resistance in bacteria is increasing (e.g. the over-use of antibiotics).
- That new antibiotics are being developed as a result of increasing antibiotic resistance.
- How mutations in bacteria and viruses could lead to epidemics and pandemics.
- What the consequences of these epidemics and pandemics might be and how to evaluate them.