

**GCSE Science**



**Module B2 – Keeping Healthy**

**What you should know**

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|  **Name:** **Science Group:** **Teacher:** |

**R.A.G. each of the statements to help focus your revision:**

*R = Red: I don’t know this*

*A = Amber: I partly know this*

*G = Green: I know this*

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| **B2.1 How do our bodies resist infection?** | **R.A.G.** |
| I understand that symptoms of an infectious disease are caused by damage done to cells by microorganisms or the poisons (toxins) they produce |  |
| I understand why, in suitable conditions such as those inside a human body, microorganisms (e.g. bacteria and viruses) can reproduce rapidly to produce very large numbers |  |
| I can calculate the population growth of microorganisms given appropriate data |  |
| Iunderstand that white blood cells are part of the body’s immune system and can destroy microorganisms by engulfing and digesting them or by producing antibodies |  |
| I understand that antibodies recognise microorganisms by the antigens that they carry on their surface, that different microorganisms have different antigens, and that a different antibody is therefore needed to recognise each different type of microorganism |  |
| I understand that once the body has made the antibody to recognise a particular microorganism, memory cells can make that antibody again very quickly, therefore protecting against that particular microorganism in the future (immunity). |  |

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| **B2.2 What are vaccines and antibiotics and how do they work?** | **R.A.G.** |
| I understand that vaccinations provide protection from microorganisms by establishing memory cells that produce antibodies quickly on reinfection |  |
| I understand that a vaccine usually contains a safe form of a disease-causing microorganism |  |
| **I understand why, to prevent epidemics of infectious diseases, it is necessary to vaccinate a high percentage of a population** |  |
| Iunderstand that vaccines and drugs (medicines) can never be completely risk-free, since individuals have varying degrees of side effects to them |  |
| I understand that due to genetic differences, people react differently to drugs and vaccines |  |
| I understand that chemicals called antimicrobials can be used to kill, **or inhibit**, bacteria, fungi and viruses |  |
| I can recall that antibiotics are a type of antimicrobial that are effective against bacteria but not viruses |  |
| I understand that over a period of time bacteria and fungi may become resistant to antimicrobials |  |
| **I understand that random changes (mutations) in the genes of these microorganisms sometimes lead to varieties which are less affected by antimicrobials** |  |
| I understand that to reduce antibiotic resistance we should only use antibiotics when necessary and always complete the course |  |
| I understand that new drugs and vaccines are first tested for safety and effectiveness using animals and human cells grown in the laboratory |  |
| I can recall that human trials may then be carried out:a. on healthy volunteers to test for safety |  |
| b. on people with the illness to test for safety and effectiveness |  |
| **I can** **describe and explain the use of ‘open-label’, ‘blind’ and ‘double-blind’ human trials in the testing of a new medical treatment** |  |
| **I understand the importance of long-term human trials** |  |
| I understand the ethical issues related to using placebos in human trials. |  |
| **B2.3 What factors increase the risk of heart disease?** | **R.A.G.** |
| I can describe the role of the heart as a double pump in the circulatory system |  |
| I understand why heart muscle cells need their own blood supply |  |
| I understand how the structure of arteries, veins and capillaries is related to their function |  |
| I understand that heart rate can be measured by recording the pulse rate |  |
| I understand that blood pressure measurements record the pressure of the blood on the walls of the artery |  |
| I understand that a blood pressure measurement is given as two numbers, the higher value when the heart is contracting and the lower value when the heart is relaxed |  |
| I understand that ‘normal’ measurements for factors such as heart rate and blood pressure are given within a range because individuals vary |  |
| I understand how fatty deposits in the blood vessels supplyingthe heart muscle can produce a ‘heart attack’ |  |
| I understand that heart disease is usually caused by lifestyle factors and/or genetic factors |  |
| Iunderstand that lifestyle factors that can increase the risk of heart disease include:a. poor diet |  |
| b. stress |  |
| c. cigarette smoking |  |
| d. misuse of drugs |  |
| I understand that regular moderate exercise reduces the risk of developing heart disease |  |
| I can relate differences in lifestyle factors in the UK and non-industrialised countries to theprevalence of heart disease |  |
| I understand how factors that can increase the risk of heart disease are identified via epidemiological and large scale genetics studies |  |
| I can assess levels of heart disease risk, and actions that could be taken to reduce risk, when provided with lifestyle and genetic data |  |
| **B2.3 What factors increase the risk of heart disease? *Continued*** | **R.A.G.** |
| I understand that high blood pressure increases the risk of heart disease |  |
| I understand that the misuse of drugs (e.g. Ecstasy, cannabis, nicotine and alcohol) can have an adverse effect on health, including heart rate and blood pressure, increasing the risk of a heart attack.  |  |

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| **B2.4 How do our bodies keep a healthy water balance?** | **R.A.G.** |
| I understand that nervous and hormonal communication systems are involved in maintaining a constant internal environment (homeostasis) |  |
| I understand that automatic control systems throughout the body maintain a range of factors at steady levels and that this is required for cells to function properly |  |
| I can recall that these control systems have:a. receptors to detect changes in the environment |  |
| b. processing centres to receive information and coordinate responses automatically |  |
| c. effectors to produce the response |  |
| **I understand the principle of negative feedback** |  |
| **I understand that negative feedback between the effector and the receptor of a control system reverses any changes to the system’s steady state** |  |
| I understand that a balanced water level is important for maintaining the concentration of cell contents at the correct level for cell activity |  |
| I understand that water levels are controlled by balancing gains from drinks, food and respiration and losses through sweating, breathing, faeces and the excretion of urine |  |
| I understand that the kidneys play a vital role in balancing levels of water, waste and other chemicals in the blood |  |

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| **B2.4 How do our bodies keep a healthy water balance?  *Continued*** | **R.A.G.** |
| I understand that the kidneys balance water levels by producing dilute or concentrated urine as a response to concentration of blood plasma, which is affected by external temperature, exercise level and intake of fluids and salt |  |
| **I understand that concentration of urine is controlled by a hormone called ADH, which is released into the bloodstream by the pituitary gland** |  |
| **I understand how ADH secretion is controlled by negative feedback** |  |
| I understand that alcohol results in the production of a greater volume of more dilute urine, **due to ADH suppression**, which can lead to dehydration and adverse effects on health |  |
| I understand that the drug Ecstasy results in a smaller volume of less dilute urine, **due to increased ADH production**. |  |

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| **Grades A\* - C (Higher)** | All statements shown in **bold** as well as all statements shown in normal type. |
| **Grades C – G (Foundation)** | All statements shown in normal type. |