KESTEVEN AND SLEAFORD HIGH SCHOOL

Biology Scheme of Learning

Year 10 – Term 2/Unit 7 Non-communicable Disease

Intent – Rationale

Students will study non-communicable diseases and should understand what is meant by risk factors for a disease. They will analyse the impact of disease at several different levels. Students should recognise correlations between data sets and the need for evidence to secure a causal mechanism. They should understand the difference between correlated data and causal mechanisms, and be able to read graphs and quote data to support correlations and causations.

Students will study cancer and the different types of tumour, along with the general causes and treatment of cancer. They should link this to mitosis and the cell cycle in B2 *Cell division*.

Students should be aware of the risks of diseases from smoking, linked to work on the heart and blood vessels in B4 *Organising animals and plants*. They should recall the roles of nicotine, carbon monoxide, and tar, and understand how each specifically affects health, as well as recalling the dangers of smoking whilst pregnant. They should have applied the concept of a causal mechanism to data on smoking and developing lung cancer. Students should understand the impact of smoking on the heart. In considering the effect of diet and exercise on disease, students should appreciate the connection between obesity and other diseases such as type 2 diabetes.

Students have studied alcohol and health, and should understand the effect of alcohol on the brain and liver, and of drinking alcohol during pregnancy.

Finally students should be aware of the sources and carcinogenic effects of ionising radiation.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
Topic B7.1 Cells and Tissues **Topic B8.11 Drugs and Health** **GCSE B1 Cells and their specialisation, diffusion, osmosis and active transport.** **GCSE B2 Cell Division**	• GCSE Units 10 Human Nervous System, 13 Reproduction. • A Level 3 Cell structure, 6 Exchange, 7 Mass Transport 15 Nervous Coordination.
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• Physics Radiation	• B7 L1-5 SMSC M1,2 and 3 • B7 L1-5 GB4 egh • B7 L2-5 BV2,3
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
FROM THE LIBRARY *Breast Cancer-362.1* *Kate Smokes-613.8* *How Do Drink and Drugs Affect Me-615*	• Interpreting data from graphs.

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?
Know Classify diseases as communicable or non-communicable. Decide whether a link is causal. Define a tumour as a mass of abnormally growing cells. State some causes of cancer. List some of the benefits and risks of chemotherapy. Name the harmful substances found in tobacco smoke. State that smoking increases your risk of developing lung diseases. Describe some health problems caused by a poor diet and lack of exercise. List some ways in which people can avoid becoming overweight. State that drinking too much alcohol can affect liver and brain function. State that alcohol can affect unborn babies. Define the term carcinogen. **Apply** Draw conclusions from data on risk factors. Describe the difference between benign and malignant tumours. Describe why carcinogens and ionising radiation increase the risk of tumours forming. Analyse data to assess the risks and benefits of chemotherapy. Describe the effects of the harmful substances found in tobacco smoke. Analyse data to describe evidence for the link between smoking and lung disease. Describe causal mechanisms for the link between exercise and health. Suggest measures to prevent a further rise in the number of people with type 2 diabetes. Describe the short- and long-term effects of drinking alcohol. Describe the effects of alcohol on unborn babies. Describe the link between ionising radiation and cancer. **Extend** Describe some impacts of non-communicable diseases. Identify risk factors from data. Explain why a correlation does not prove a causal mechanism. Explain how benign and malignant tumours can be life-threatening. Link a lack of control in the cell cycle to tumour formation. Evaluate the risks of chemotherapy in relation to data, drug testing, and consequences in order to come to an informed decision. Explain in detail the effects of the harmful substances found in tobacco smoke. Suggest possible causal mechanisms to explain trends shown in data, and explain how the causal link between smoking and lung cancer was identified. Suggest reasons for the correlation between exercise and health, and decide which are causal. Explain in detail why eating a poor diet can lead to health problems. Explain in detail how drinking alcohol affects the nervous system. Evaluate evidence on the effects of alcohol on a developing baby. Explain the link between ionising radiation and cancer.

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?

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benign tumours
growths of abnormal cells that are contained in one area, usually within a membrane, and do not invade other tissues

cancer
the common name for a malignant tumour, formed as a result of changes in cells that lead to uncontrolled growth and division

carcinogens
agents that cause cancer or significantly increase the risk of developing cancer

causal mechanism
something that explains how one factor influences another

correlation
an apparent link or relationship between two factors

ionising radiation
has enough energy to cause ionisation in the materials it passes through, which in turn can make them biologically active and may result in mutation and cancer

malignant tumours
invade neighbouring tissues and spread to different parts of the body in the blood where they form secondary tumours. They are also known as cancers

tumour
a mass of abnormally growing cells that forms when the cells do not respond to the normal mechanisms that control growth and when control of the cell cycle is lost

- **Long Answer Question L5**
- **B7 End of Topic test**

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Intent – Concepts

Lesson title	Learning challenge I can	Higher level challenge I can	Suggested activities and resources
B7 L1 Non-communicable Diseases	Discuss how health is the state of physical and mental well-being. Diseases, both communicable and non-communicable, are major causes of ill health. Define what is meant by disease and non-communicable disease. Discuss the human and financial cost of these non-communicable diseases to an individual, a local community, a nation or globally Describe how risk factors are linked to an increased rate of a disease. They can be: i. aspects of a person's lifestyle ii. substances in the person's body or environment.	Evaluate how other factors including diet, stress and life situations may have a profound effect on both physical and mental health. Describe how different types of disease may interact. Discuss how a causal mechanism has been proven for some risk factors, but not in others.	
B7 L2 Cancer	Describe cancer as the result of changes in cells that lead to uncontrolled growth and division. Describe how benign tumours are growths of abnormal cells which are contained in one area, usually within a membrane. They do not invade other parts of the body. Describe how malignant tumour cells are cancers. They invade neighbouring tissues and spread to different parts of the body in the blood where they form secondary tumours.	Link the development of cancer to changes in genetic control of the cell affecting mitosis. Explain metastasis.	

	Identify lifestyle risk factors for various types of cancer. Explain how there are also genetic risk factors for some cancers.		
B7 L3 Smoking and the Risk of Disease	Explain the effect of smoking on a. The risk of developing cardiovascular disease b. The risk of developing lung disease and lung cancer c. Unborn babies	Link the part of tobacco smoke responsible for cardiovascular disease and lung disease. Explain how these diseases develop. Link CO to premature birth/still birth	https://robertcarretrust.sharepoint.com/sites/RCT-Files-Staff/Shared%20Documents/KSHS/Departments/Curriculum/Science/KS4/BIOLOGY%20KS4/AQA%20GCSE/Year%2010/B7%20Non-communicable%20diseases/Lesson%203
B7 L4 Diet, Exercise and Disease	Explain the effect diet and exercise on a. Development of obesity b. The risk of developing cardiovascular disease Descrie how obesity is a risk factor for type 2 diabetes	Calculate BMI Evaluate use of BMI as a tool for determining health.	
B7 L5 Alcohol and other carcinogens	Explain the effect of alcohol on a. the liver and brain function. b. unborn babies Describe how carcinogens, including alcohol and ionising radiation, as risk factors in cancer. Many diseases are caused by the interaction of a number of factors.	Describe how alcohol causes cirrhosis Evaluate the link between alcohol and FAS	
B7 L6 Graph Skills	Translate disease incidence information between graphical and numerical forms, construct and interpret frequency tables and diagrams, bar charts and histograms, and use a scatter diagram to identify a correlation between two variables.(in terms of risk factors)	Understand the principles of sampling as applied to scientific data, including epidemiological data and in terms of risk factors.	

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	Extract and interpret information from charts, graphs and tables in terms of risk factors.		
B7 L7 Test			