Year 9 Biology Health and Disease

West Kirby Grammar School

Learning about this topic is important because: Understanding the negative effects of smoking and asthma on the respiratory system allows use to understand factors that may inhibit a person's ability to exercise. This knowledge links to why there is an increase in the incidence of non-communicable disease. With knowledge of the risk factors and an understanding of how different disease interact, students will gain an increased understanding of how diseases may be prevented and provide a foundation of knowledge to help understand communicable disease. Being able to translate information from graphical and numerical form is an important skill for students to transfer to GCSE. Knowledge of a balanced diet and the consequences of imbalances helps students to understand their body and how to stay healthy.

This builds on: : The knowledge of the digestive system studied in year 7 and 8 and importance of a balanced diet which was visited in Year 8 respiration, breathing and movement module. Your knowledge of the required components of a balanced diet will provided a foundation for understanding consequences of imbalances. Understanding the structure and function of the lungs helps to understand the consequences of asthma and smoking. We will use your prior learning as a benchmark for your studies throughout the course.

This leads to: At GCSE in Y10 we will learn about the communicable disease, pathogens and the immune system. Students will learn about the role of the circulatory system and be able to link the role of the respiratory system to this and how they complement each other. Knowledge of a balanced diet and digestion will help to understand digestive system covered in GCSE in year 10. The knowledge will also be covered in KS5 in the cells and cell recognition and the immune system topic.

We will learn:

- The negative affect of asthma and smoking on the respiratory system
- The benefits of exercise
- The importance of a balanced diet and the consequences of imbalances.
- The important role that bacteria play in the digestive system
- The effects of recreational drugs on behaviour, health and life processes.
- The risk factors associated with non-communicable disease and how different diseases interact.
- The effects of various factors on the incidence of non-communicable disease.
- Translate disease incidence information from graphical and numerical forms and identify a correlation.

We will develop/practise skills including:

- Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
- present observations and data using appropriate methods, including tables and graphs
- Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
- 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.
- Interpret data about risk factors for specified diseases. Understand the principles of sampling as applied to scientific data in terms of risk factors
- Present reasoned explanations, including explaining data in relation to predictions and hypotheses
- Identify further questions arising from their results.

Some of the vocabulary that we will use includes:

You could learn more about this topic by:

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Non-Communicable – *A disease not transferred from one organism to another* Communicable – *A disease caused by pathogens and can be passed from one organism to another.* Disease – *a condition that disrupts how the body functions and can lead to ill health* Pathogen – *A disease causing microorganism – can be protist, fungi, bacteria or virus.* Health – *State of physical, mental and social well-being, where individuals can function at their best, not just being disease free.* Deficiency – *Caused by a diet lacking an amount of certain vitamin or minerals.* Risk Factor – *Something that increases the likelihood of developing a disease (it does not cause it).* Interaction – *Different diseases can interact to cause further problems or increase the likelihood of developing another.* Respiration – *An exothermic chemical reaction that occurs in mitochondria to release energy.*	Read: KS3 biology Health and Disease https://www.bbc.co.uk/bitesize/subjects/z4882hv Watch: Nutrition and health https://www.youtube.com/watch?v=b6AroBL_IBEhttps://www.bbc.co.uk/sounds/play/p00545gl

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

HOME LEARNING: Investigate the health issues associated with too much or too little food. **This is teacher assessed.**

HOME LEARNING: Research and produce a poster about non-communicable disease. **This is self assessed.**

HOME LEARNING: Analyse, describe and explain data and graphs related to disease, and identifying different correlations– **This is teacher assessed.**

- End of topic assessment. **This is teacher assessed**.

Year 9 Biology Inheritance and Variation

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Learning about this topic is important because: understanding inheritance allows us to identify and treat inherited disorders. It also allows us to genetically engineer and breed particular types of animals and plants that we can use more successfully in farming (although you will learn more about this at GCSE, this unit provides the foundation for that). Learning about evolution allows us to understand where life (including us) has come from and what may happen in the future. Also linking the above knowledge with current ecosystems will allow us to protect habitats and organisms for the future and help inform us of environmental change and how to prevent it.

This builds on: recognising that environments can change and that this can sometimes pose dangers to living things, recognising that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents and identifying how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution from primary school. We will use your prior learning as a benchmark for your studies throughout the course.

This leads to: At GCSE in Y11, you will learn about Scientists and concerned citizens have put in place programmes to reduce the negative effects of humans on ecosystems and biodiversity, the structure of DNA and defining the genome, genetic inheritance including genetic cross diagrams, inherited disorders and sex determination, selective breeding, cloning and genetic engineering, evidence for evolution, speciation.

We will learn:

- Heredity as the process by which genetic information is transmitted from one generation to the next.
- A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model.
- Differences between species.
- The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation.
- The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.
- Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.
- The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material

We will develop/practise skills including:

- Curiosity - ask questions and develop a line of enquiry based on observations of the real world alongside prior knowledge and experience.
- Make predictions.
- Evaluate risks.
- Apply mathematical concepts and calculate results.
- Make and record observations.
- Use and derive simple equations and carry out appropriate calculations.
- Use appropriate techniques, apparatus and materials during lab work paying attention to health and safety.
- Pay attention to objectivity and concern for accuracy, precision, repeatability, and reproducibility.
- Present observations and data using appropriate methods, including tables and graphs.
- Present reasoned explanations, including explaining data in relation to predictions and hypotheses.

- Mathematical skills – mean calculations and graph work.

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	• Practical skills – extracting DNA. • Analysing data linking concepts and ideas.
Some of the vocabulary that we will use includes: **Word** — **Definition** **Inheritance** — The passing of characteristics (traits) from parents to their children through genes. **Variation** — The differences between individuals of the same species. For example, people have different eye colours and heights. **Biodiversity** — The variety of different living organisms in a habitat or on Earth. **Extinct** — When a species has died out completely and no individuals are left alive. **Heredity** — The process of passing traits from parents to offspring through genes. **Hereditary** — A characteristic or condition that is passed from parents to children through genes. **Gene** — A small section of DNA that contains the instructions for a particular characteristic or function. **Natural selection** — The process where organisms with helpful adaptations are more likely to survive, reproduce, and pass on their genes.	You could learn more about this topic by: Read: KS3 Inheritance and genetics https://www.bbc.co.uk/bitesize/topics/zpffr82 Watch: GCSE Variation and Evolution https://www.youtube.com/watch?v=VjlE5Qzl1S0 Listen: In our time: Evolution https://www.bbc.co.uk/sounds/play/p00545gl

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

- HOME LEARNING: Collect data of physical features from the class members. Identify the type of variation and put the data into appropriate tables and graphs. This is teacher assessed.
- Graph work, data handling and maths skills – assessed in lessons and home learning.
- HOME LEARNING: Complete worksheet DNA structure. This is teacher assessed.
- End of topic assessment. This is teacher assessed.