KS3 Curriculum Map – Biology:

Topic	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic in order to gain substantive knowledge.	Assessment Opportunities What assessments will be used to measure student progress?
Lab safety	• Expectations within the Biology department. • Lab safety rules.	• To provide a safe learning environment. • To identify any risks in the laboratory. • Describe lab safety rules. • Design a Risk Assessment.	• Correct use of keywords. • Create a lab safety poster. • Write a risk assessment for a simple practical.
Cells	• Plant and animal cell theory. • Specialised cells. • Unicellular organisms and their functions. • Movement of substances.	• Label plant and animal cells. • Describe the functions of organelles. • Identify specialised cells and explain their adaptations. • Use a microscope to observe the above and draw a scientific diagram. • Investigate diffusion using agar gel and hydrochloric acid.	• Correct use of keywords. • Carry out each practical safely and accurately. • End of topic test.
Structure and function of body systems	• Understanding body organisation. • Knowledge of the respiratory system and gas exchange. • Knowledge of the skeletal system and it's interaction with muscles and joints.	• Link cells to organisation of body systems with the example of the lungs and skeletal system. • Identify links between diffusion and body systems e.g., gas exchange. • Carry out a practical to demonstrate how the body responds to exercise.	• Correct use of keywords. • Plan practical activity. • Carry out each practical safely and accurately. • Evaluate and analyse results. • Extended writing in reference to ventilation and gas exchange.

The reproductive system	• Adolescence. • Reproductive System Structure. • Fertilisation and implantation. • Development of Foetus. • The menstrual cycle. • Pollination and germination. • Seed dispersal.	• Describe changes that take place during puberty. • Label images of the male and the female reproductive systems. • Describe the structure and function of gametes. • Use diagrams to show the stages of the development of the foetus. • Describe the main stages of the menstrual cycle. • To understand how contraception and fertility treatments work. • Compare and contrast wind and insect pollinated plants. • Explain how seed are formed through the process of fertilisation. • Describe how seeds are adapted for dispersal.	• Correct use of keywords. • Extended writing in terms of discussing the development of the foetus and the menstrual cycle. • Carry out flower dissection and discuss safety procedures. • Seed dispersal practical to use evaluation and mathematical skills. • Planning an investigation to ascertain the effect of rainfall on germination.
Food and digestion	• Components of a healthy diet. • Food tests. • Health issues caused by an unhealthy diet. • The structure and function of the digestive system. • The role of enzymes and bacteria in digestion.	• To explain the role of each food group in the body. • To carry out each food test and describe the positive result. • Using data to describe the consequences of an unhealthy diet. • To be able to calculate the energy requirements of different people. • Correctly label the digestive system and describe the events. • To explain the roles of enzymes and bacteria and their roles in digestion.	• Correct use of keywords. • Research nutritional label values. • Design a person specific diet. • Extended writing in terms of the pathway of food through the digestion system. • Research task of enzyme function. • Analysis and evaluation of the effect of amylase on starch. • Investigate to calculate the energy available in food.

Interdependence	• Food chains and food webs. • Disruption to food webs and food chains. • Adaptations. • Predator/Prey relationships. • Ecosystems. • Competition.	• To be able to explain what food chains and food webs show. • To be able to combine food chains to form a food web. • To explain the importance of interdependence and the effects that environmental changes can have on it. • To explain the process of bioaccumulation. • To describe and explain how species adapt to their environments. • To be able to describe how different organisms co-exist within an ecosystem. • Explain different types of competition and the effect it has on population numbers.	• Correct use of keywords. • Students to make their own food webs. • Extended writing. • Flanimals competition. • Design an experiment to see how different birds' beaks are adapted for food. • Looking at graphical data to explain predator/prey relationships.
Respiration and fermentation	• Describe the difference between aerobic and anaerobic respiration and explain when and why each is needed. • To know the role of anaerobic respiration in fermentation processes.	• Recall equation for respiration. • Identify links between photosynthesis, respiration and food chains. • Explain changes that occur in the body during exercise. • Explain how fermentation is used in alcohol and food production.	• Correct use of keywords. • Investigate the effect of exercise on breathing rate. • Extended writing in reference to the body's response to exercise.
Photosynthesis	• Describe photosynthesis and respiration. • Structure of the leaf. • Limiting factors of photosynthesis. • Describe the role of plant minerals. • Describe the process of chemosynthesis.	• Recall the equation for photosynthesis. • Identify links between photosynthesis, respiration and food chains. • Label the structure and recall functions of specialised cells in the leaf. • Sketch a line graph to show how the rate of photosynthesis is affected by changing conditions. • Explain the importance of chemosynthesis in bacteria.	• Correct use of keywords. • Carry out the variegated leaf practical accurately and safely. • Investigate the effect of fertilisers on the growth of seeds.

Variation and Inheritance	• Variation and Species. • Differences between continuous and discontinuous variation. • Inheritance. • DNA and its discovery. • Genetics. • Inherited disorders.	• Explain how variation occurs. • Explain whether characteristics are inherited, environmental or both. • Describe the difference between environmental and inherited variation. • Investigate variation and analyse data. • Be able to use graphical data to see the relationship between continuous and discontinuous variation. • Recall the definitions of the keywords: chromosome, gene and DNA and link to their function. • Describe how characteristics are inherited. • Determine how the number of chromosomes changes during cell division, production of sex cells, and fertilisation. • Describe how scientists worked together to develop the DNA model. • Explain how a change in the DNA may affect an organism and its future offspring.	• Plot a bar and/or line graph to illustrate continuous and discontinuous data. • Practical skills – investigation into arm span giving an opportunity for maths skills. • Correct use of keywords. • Research the discovery of the structure of DNA. • Apply knowledge of inheritance and mutations using fur colour in rabbits as an example.
Classification and Evolution	• Classification keys. • Charles Darwin. • Natural selection. • Biodiversity. • Extinction.	• To be able to use classification keys to sort living organisms into groups. • Create and use simple classification key. • Describe the process of natural selection and the evidence collected by Darwin. • Define biodiversity and its relationship with an ecosystem. • Describe factors that may lead to extinction and techniques used to prevent it.	• Correct use of keywords. • Create an identification key. • Extended writing using key words on variation. • Create and use a functional classification key. • Correct use of keywords. • Evaluate whether evidence for a species changing over time supports natural selection. • Extended writing task.

Microbes and disease	• Types of microbes and how they grow. • The effect of microbes in the body. • Types of diseases. • Uses of vaccines and antibiotics.	• Label the key features of common pathogens. • Describe how microbes enter the body and how the body is adapted to help protect us from disease. • Research and present information on a variety of diseases. • Describe how vaccines and antibiotics can be used to prevent and treat disease.	• Correct use of keywords. • Safely grow a culture of bacteria. • Create and explain a population growth curve. • Safely investigate the effectiveness of antibiotics.
Health	• Health. • Drugs. • Alcohol. • Smoking. • Exercise.	• Define health and the influence of drugs, alcohol, smoking and exercise on health. • Identify how they affect body systems.	• Correct use of keywords. • Safely identify unknown substances in a practical activity. • Plan a practical that will allow you to investigate the effect of alcohol on reaction times. • Data analysis related to health.
Uses of new technology in Biology	• Selective breeding. • Genetic engineering. • Cloning. • Microscopy. • Fingerprinting and DNA finger printing. • Blood typing. • Pathology.	• Describe the process of selective breeding. • State how genetic engineering is carried out. • Describe how clones are made. • Discuss the advantages and disadvantages of selective breeding, genetic engineering and cloning. • Describe the differences between a light and electron microscope and how microscopic evidence is used in forensic science. • Describe how fingerprints are formed. • Describe the uses of DNA fingerprinting. • Describe the structure and function of blood components and what is meant by a blood group. • Describe the role of a pathologist to solve crime.	• Correct use of keywords. • Data analysis and forming conclusions. • Evaluation of results. • Extended writing task.