Subject: Biology

Year 7 Curriculum Content

Autumn term content overview

Characteristics of life.
Introduction to the cell and cell functions (plants, animals, fungi and bacteria) and cell specialisation. We will use these topics to introduce microscopy skills.
The first half term or so to be spent looking at How Science Works and generic science practical skills- including the concept of a fair test, drawing tables and graphs.

Spring term content overview

Reproduction- a comparison of sexual and asexual strategies. Human reproductive organs and their functions in males and females; the menstrual cycle, fertilisation, pregnancy and birth.
Sexual reproduction in plants- to include a flower dissection. A look at food security and the valuable role played by pollinators. This unit of work will enable us to discuss the school beehives.
The second half of the spring term will look at the diffusion and the life process of respiration- distinguishing between aerobic and anaerobic methods. An opportunity to look at fair planning an experimental investigation into the effect of yeast on dough.

Summer term content overview

The structure of the lungs; gaseous exchange in the alveolus and the mechanism of breathing. Consideration will be given to the main types of lung disease, such as asthma and also the effect of smoking on the lungs and wider health.
The second half of the summer term will look at types of circulatory system; the structure of the heart and the major blood vessels. Finishing with a look at blood composition.

Year 8 Curriculum Content

Autumn term content overview

The nature of a balanced diet, healthy eating and the eat well plate; The changing nature of energy requirements at different stages of life and the demands of different lifestyles and pregnancy on energy balance. A practical investigation into the energy content of monster munch will practise drawing tables and performing simple mathematical calculations, as well as evaluation. Consequences of energy imbalance and deficiency disorders; a practical investigation into food tests will practise skills in accurate observation and safe experimental work.
The second half of the term will consider the need for a digestive system; the structure and function of key organs of the human digestive system; the role of mechanical digestion and enzymes in digestion. A practical looking at the effect of temperature and enzyme activity will provide an opportunity to plan and write up a full experimental investigation.

Spring term content overview

The human skeleton; joints and movement; antagonistic muscles and the nature of muscle contraction. Adaptation of animal skeletons to differing lifestyles will be considered.
Bacteria and microorganisms; harmful and useful microbes. The history of vaccination including the work of Edward Jenner. The discovery of antibiotics by Sir Alexander Fleming.
Practical work will include developing aseptic technique in the culturing microorganisms in the laboratory; a practical investigation into the effect of antibiotics on cultured bacteria, looking at practising skills in analysis and evaluation.

Summer term content overview

Plant nutrition and the nature of photosynthesis; practical work will include a starch test on a leaf, the importance of carbon dioxide and a full investigation into the effect of a limiting factor on the rate of photosynthesis on Elodea. Adaptation of the leaf to photosynthesis and the fate of glucose in the plant will be considered.

Year 9 Curriculum Content

Autumn term content overview

Ecology and the nature of ecosystems; abiotic and biotic factors and their effect on distribution of species in an ecosystem- investigated practically in the school grounds with a look at field study techniques such as quadrat use; the nature of predator and prey relationships; trophic levels and pyramids of biomass; the efficiency of energy transfer in food webs and implications for food production and land use; competition and the adaptations of plants and animals.
The second half of term will consider nutrient cycles with a close look at the carbon and nitrogen cycle. The importance of decay and decomposition will be investigated practically.

Spring term content overview

Human impact on the environment: global warming and climate change; pollution, deforestation and agricultural effects; biodiversity and how to measure it; conservation and maintaining biodiversity. Biotechnology and the role it has to play in maintaining food security.
Variation and its causes; the work of Gregor Mendel and simple genetic crosses; the theory of evolution, natural selection and the evidence in support of evolution and natural selection.

Summer term content overview

The work of Charles Darwin and Wallace will be explored with project work; Selective breeding and the production of new varieties of crops; genetic engineering and GM crops and a debate on the ethics of GM technology.
Cloning in plants and animals.

Enrichment activities

Possible visits to the Natural History Museum and local field study sites, e.g. Durlston
Biology club with involvement from the biology subject ambassadors.
Bee club meets regularly throughout the year and there are opportunities for visits to local honey farms.

Skills developed in KS3

Practical experimental and lab skills; recording and analysis of results; presentation of scientific data through tables and graphs.
The use of a microscope.
Basic field study skills.

Textbook/ resources

'Science Scope' textbook; various more senior text books as appropriate for specific lesson segments; Biology department laptop computers, extensive bioscience video library, four well-equipped Biology labs; 30 x microscopes and dataloggers; The school grounds, e.g. woodland and ponds will be used too, along with the departmental greenhouse.

Useful Websites

Bitesize: http://www.bbc.co.uk/education/subjects/zng4d2p