Science – BIOLOGY - Performance Descriptors

Progress Points	Biology
Year 9 45 44 43 42	• Evaluate the relative importance of genetic and environmental variation. • Describe selective breeding as breeding animals with desirable features. Explain the process of selective breeding. Evaluate the importance of selective breeding. • Describe the structure of the nucleus as containing chromosomes and genes that carry inherited genetic information. Explain that chromosomes are made of genes containing DNA, and that DNA is a double helix of four chemicals. Research the work of Watson, Crick, Wilkins and Franklin on the DNA model. • Identify that all plant and animal cells contain DNA. Explore the importance of our ability to extract DNA from cells. Analyse and evaluate the use of extracted DNA. • Identify that at fertilisation, the egg cell contains one chromosome from each parent in every chromosome pair. Explain how fertilisation results in each new individual being genetically unique. Explain how some genetic conditions arise e.g. Down's syndrome. • Explain how genetic information is passed on from parents and the role of dominant genes. Research and explain the significance of the work of Gregor Mendel. Describe simple genetic crosses using Punnett squares. • Describe what cloning is and a variety of natural cloning processes e.g. runners, bulbs, corms, tubers etc. Explain how artificial cloning occurs with reference to Dolly the sheep • Analyse and evaluate ethical issues about artificial cloning. Compare and contrast asexual and sexual reproduction. • Describe examples of the four main groups of drugs. Describe the effects of different types of drugs on the body. Explain the effects of each type of drug on the body. • Describe how vaccines were discovered. Explain how vaccines prevent a viral infection. Evaluate the risks involved with vaccination.

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Year 8 38 37 36 (35)	• Describe how some bacteria produce food by photosynthesis by chemosynthesis. Compare chemosynthesis and with photosynthesis. Explain how levels of light, temperature and carbon dioxide affect the rate of photosynthesis. • Explain how mitochondria are adapted for respiration. Explain the term 'oxygen debt'. • Explain how energy flows through a food web. Explain examples of interdependence. Describe predator-prey relationships. • Describe and explain aerobic respiration in plants and animals. Describe anaerobic respirations and give of sports that use anaerobic respiration. • Identify water and carbon dioxide as the raw materials for photosynthesis, and glucose and oxygen as the products. Explain the chemical changes involved in photosynthesis • Identify muscles that contract to cause specific movement. Compare the movement allowed at different joints and explain why different types of joints are needed. • Describe how the features of the alveoli and how this supports gas exchange. Describe the effects of exercise, smoking and asthma on the respiratory system • Describe some of the adaptations of the digestive system. Explain the role of the digestive organs. • Explain why some people have different energy requirements. Explain some of the physical effects of obesity, starvation and deficiency diseases.
Year 7 35 34 33 (32)	• Describe some medical problems that can arise with skeletal system. Describe some treatments for a range of problems within the skeletal system. • Describe the function of the skeleton. Identify some different joints and explain the role of tendons and ligaments in joints. • Summarise the advantages and disadvantages of selective breeding and make reference to desirable characteristics of key species. • Explain why nutrients are needed by plants. Name some of the nutrients required for plant growth. • Describe the structure and function of the male and female reproductive systems; describe how fertility problems may arise. • Compare and contrast physical and chemical digestion. Describe some of the adaptations of the digestive system. • Recognise, label and describe basic and specialised animal and plants cells. • Describe the function of specialised parts of different unicellular organisms. • Explain the factors that affect diffusion. • Recall the test for starch, Sugar, protein and fats. • Explain the differences between wind pollinated and insect pollinated plants. • Describe the terms cell, tissue, organ and organ systems. • Identify and name the different body systems within the human body.

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Year 6 32 31 30 (29)	• Describe how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. • Describe the features of evolution and explain how the theory was developed with reference to key scientists. • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify and name the main parts of the human circulatory system describe the functions of the heart, blood vessels and blood • Identify the differences between wind and insect pollinated plants. • Describe the role of different parts of a flowering plant in reproduction. • Explain the role of the components of a healthy diet. • Describe the process of diffusion. • Recognise that the skeleton is used for support, movement and structure. • Describe the ways in which nutrients and water are transported within animals, including humans. • Explain why classification is important for both plants and animals. • Describe the life processes within humans and specific animals. • Recognise and name the basic requirements that an animal or human needs to survive.
Year 5 29 28 27 (26)	• Describe the lifecycle of a mammal, amphibian, insect or bird. • Be able to identify living things using different kinds of keys. • Be able to describe the changes as humans develop from birth to old age • Identify and describe different seed dispersal methods. • Identify how the blood moves around the body. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Identify what a plant needs in order to grow and thrive.
Year 4 25 24 23 (22)	• Describe the lifecycle of a flowering plant. • Describe life processes that define a living thing. • Recognise and identify that living things can be grouped in a variety of ways. • Identify and name different food groups which help the body stay healthy. • Recognise key features of different animals and plants and identify simple differences between them. • Identify and define the qualities of a successful habitat.

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Progress Points	Biology
Year 3 21 20 19 (18)	• Identify that humans and some other animals have skeletons and muscles for support, protection and movement. • Identify that most living things live in habitats and describe how different habitats provide for the basic needs of animals and plants.