

	STRAND 1 Fundamental biology	STRAND 2 Gas exchange and respiration	STRAND 3 Body systems	STRAND 4 Ecology	STRAND 5 Inheritance	STRAND 6 Working scientifically
9	All the below and... - can evaluate the methods of sexual versus asexual reproduction. - can describe the function of mitochondria and ribosomes. - can explain the difference between sexual and asexual reproduction. - can suggest what factors affect the rate of diffusion and explain these.	All the below and... - can analyse graphs of breathing and heart rate before, during and after exercise. - can define oxygen debt. - can outline the pros and cons of aerobic and anaerobic respiration for organisms.	All the below and... - can explain why maintaining body temperature is essential for enzyme function. - can suggest the impacts that having artificial parts of the skeletal system may have on an individual.	All the below and... - can write a balanced symbol equation for photosynthesis. - can evaluate organic versus inorganic farming methods.	All the below and... - can outline the process of genetic engineering. - can describe the purpose and advantages of genetic engineering using examples.	All the below and... - can explain and use the terms accuracy, precision, repeatability, reproducibility, range, interval and bias correctly and in any context. - can use data to support or refute an argument or stated position.
8	All the below and... - can describe some methods used to treat infertility and evaluate these methods; considering moral, ethical and economic issues. - can explain how the menstrual cycle is involved in fertilisation and how infertility can be affected by changes to the menstrual cycle.	All the below and... can compare and contrast aerobic and anaerobic respiration.	All the below and... - can calculate the energy requirements of different groups of people (teenagers, the elderly, males and females). - can describe how bacteria can aid human digestion.	All the below and... - can explain how leaves are adapted for efficient photosynthesis. - can explain the importance of photosynthesis in maintaining levels of oxygen and carbon dioxide in the atmosphere. - can evaluate the importance of insect pollinators within the ecosystem with reference to human food supply. - can explain what is meant by bioaccumulation and suggest the effects of bioaccumulation on the ecosystem.	All the below and... - can discuss the roles of Watson, Crick, Wilkins and Franklin in the discovery of DNA. - explain the process of natural selection and how this leads to evolution; with reference to variation and adaptation. - can explain the use of gene banks to maintain biodiversity.	All the below and... can present reasoned explanations, including explaining data in relation to predictions and hypotheses.
7	All the below and... - can compare and contrast plant cells to animal cells. - can investigate methods of seed dispersal mechanisms. - can evaluate the effects of recreational drugs on the human body, health as well as social aspects.	All the below and... - can explain how pressure changes during ventilation - can analyse data to assess the impact of exercise, asthma and smoking on the human gas exchange system. - can recall the word equations for aerobic and anaerobic respiration.	All the below and... - can state and explain which muscles in the body may need to be stronger than others. - can explain how the skeletal and muscular systems work together to form the musculoskeletal system. - can explain the function of antagonistic muscle pairs.	All the below and... - can write the word-equation for photosynthesis; identifying the reactants and products. - can explain the importance of photosynthesis for life on earth, with reference to food chains.	All the below and... - can describe what is meant by continuous and discontinuous variation; giving examples of each. - can describe the function of DNA, genes and chromosomes and explain how they are related to one another. - can describe how gene banks may be used to maintain biodiversity. - can describe how competition can lead to extinction.	All the below and... - understands and uses IUPAC chemical nomenclature. - can identify further questions arising from the results of an investigation. - can apply sampling techniques.
6	All the below and... - can label parts of cells from a diagram. - can describe the functions of the main parts of animal and plant cells. - can define the terms; tissue, organ and organ system. - can explain how gametes are involved in fertilisation. - can describe the menstrual cycle. - can outline some methods of seed and fruit dispersal. - can explain some effects of recreational drugs on the human body and health.	All the below and... - can explain how the lungs and trachea are adapted for efficient gas exchange. - can describe how lung volume changes during breathing. - can describe how exercise, asthma and smoking affects the human gas exchange system. - can describe the commercial uses of aerobic and anaerobic respiration.	All the below and... - can explain how an unbalanced diet may affect the human body; with examples. - can explain the process of digestion, including the role of enzymes.	All the below and... - can state the function of the stomata in plant leaves. - can state the reactants and products of photosynthesis. - can explain how organisms may be affected by changes in their environment. - can draw and interpret food webs. - can explain how a change in the numbers of one organism may affect another, referring to competition and predation.	All the below and... - can describe what is meant by inherited variation and environmental variation. - can state that generic information is inherited. - can state that due to variation, some individuals within a species will be better adapted for competition. - can define biodiversity. - can state that gene banks are important in maintaining biodiversity.	All the below and... - can evaluate data showing awareness of potential sources of random and systematic error. - can undertake basic data analysis including simple statistical techniques. - can recognise anomalous results in data. - can calculate mean data while recognising the need to exclude anomalous results from mean calculations.

5	All the below and... • can describe the process of diffusion. • can give some examples of tissues and organs. • can list the main parts of animal and plant cells. • can state the structural adaptations of some unicellular organisms, such as flagella. • can describe how some animal and plant cells are adapted for their function. • can describe the functions of some reproductive tissues and organs in plants. • can describe some effects of recreational drugs on the human body and health.	All the below and... • can state what happens to the air, ribs and diaphragm during inhalation and exhalation. • can define the term 'respiration' • can state the difference between aerobic and anaerobic respiration.	All the below and... • can describe what is meant by a balanced, healthy diet; including the roles of the different nutrients. • can carry out an investigation to measure the force of a muscle.	All the below and... • can state that plants use their leaves and the process of photosynthesis to make carbohydrates. • can describe how organisms may be affected by changes in their environment.	All the below and... • can state that all organisms show variation, including within the same species and between members of different species.	All the below and... • can make and record observations and measurements using a range of methods for different investigations. • can comment on the reliability of methods. • can suggest possible improvements to an investigative technique • can work out appropriate axes and scales for graphs. • can draw best-fit lines for appropriate data. • knows that scientific theories develop as earlier explanations are modified to take into account new evidence. • understands the importance of publishing results and peer review.
4	All the below and... • can state that the cells are the 'building blocks' of living organisms. • can list some equipment that may be used to observe cells. • can define 'diffusion'. • can describe how cells, tissues, organs and organ systems are linked in multicellular organisms. • can give examples of tissues and organs in the human reproductive systems. • can describe the functions of some human reproductive tissues and organs. • can describe what happens during pregnancy and birth. • can discuss how to have a healthy pregnancy. • can name some plant reproductive tissues and organs. • can list some effects of recreational drugs on the human body and health.	All the below and... • can name some human gas exchange tissues and organs. • can describe the functions of some human gas exchange tissues and organs.	All the below and... • can identify from a diagram; bones, muscles, cartilage, tendons and ligaments. • can describe the functions of bones, muscles, cartilage, ligaments and tendons. • can list the different types of joint and give an example of each joint type.	All the below and... • can describe how a change in the numbers of one organism may affect another. • can draw and interpret simple food chains. • can state the function of plant roots. • can state that all organisms in an ecosystem may affect each other and are affected by changes in their environment.	All the below and... • can identify how animals and plants are adapted to suit their environments and that adaption may lead to evolution.	All the below and... • can use simple equations to carry out calculations from results and interpret observations to identify simple patterns. • can ask questions based on observations and make simple predictions. • can plan a simple investigation and identify independent, dependant and control variables • can recognise some potential sources of error.
3	All the below and... • can recognise how different types of diet, exercise, drugs and lifestyle can affect the body. • can describe what is meant by reproduction in plants and animals.	All the below and... • can explore and compare the differences between things that are living, dead or never been alive.	All the below and... • can name some tissues and organs in the human digestive system. • can describe the functions of some tissues and organs in the human digestive system.	All the below and... • can describe how living things are classified into broad groups based on observable similarities or differences. • can give reasons for classifying plants and animals based on characteristics.	All the below and... • can recognise that living things produce offspring of the same kind.	All the below and... • can name and use some Si units. • can name some common chemicals such as water, hydrochloric acid and sodium chloride. • can identify hazards and carry out a simple risk assessment. • can identify simple patterns or trends from data presented in graphs.
2	All the below and... • can recognise and describe the functions of the roots, stem, leaves and flowers.	All the below and... • can describe the importance of exercise for humans.	All the below and... • can identify the main organs of the human circulatory system. • can outline the functions of the heart, blood vessels and blood. • can identify that humans and some other animals have skeletons and muscles for support.	All the below and... • can observe and describe how seeds and bulbs grow into mature plants. • can recognize that environments can change and that this can sometimes pose dangers to living things.	All the below and... • can recognise that normally offspring vary and are not identical to their parents.	All the below and... • can present findings and draw simple conclusions from experimental data. • can present observations and data using simple tables and graphs where axes and scales are provided.
1	Can... • name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • identify and name some common carnivores, herbivores and omnivores.	Can... • describe the basic need for air in humans.	Can... • identify, draw, name and label the basic parts of the human body. • say which part of the body is associated with each sense.	Can... • identify and name a variety of common wild and garden plants, including evergreen trees and deciduous trees. • identify the basic structure of a variety of common flowering plants.	Can... • notice that animals, including humans, have offspring which grow into adults.	Can... • take measurements, including repeat readings using a range of scientific equipment. • draw simple, correctly-labelled scientific diagrams. • follow instructions safely.