



Step	Strand 1 Fundamental biology <i>(Equal weighting)</i>	Strand 2 Gas exchange and respiration <i>(Equal weighting)</i>	Strand 3 Body systems <i>(Equal weighting)</i>	Strand 4 Ecology <i>(Equal weighting)</i>	Strand 5 Inheritance <i>(Equal weighting)</i>	Strand 6 Working scientifically <i>(Equal weighting)</i>	EOKS4 ESTIMATE
9	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can evaluate the methods of sexual versus asexual reproduction.</li> <li>can describe the function of mitochondria and ribosomes.</li> <li>can explain the difference between sexual and asexual reproduction.</li> <li>can suggest what factors affect the rate of diffusion and explain these.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can analyse graphs of breathing and heart rate before, during and after exercise.</li> <li>can define oxygen debt.</li> <li>can outline the pros and cons of aerobic and anaerobic respiration for organisms.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can explain why maintaining body temperature is essential for enzyme function.</li> <li>can suggest the impacts that having artificial parts of the skeletal system may have on an individual.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can write a balanced symbol equation for photosynthesis.</li> <li>can evaluate organic versus inorganic farming methods.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can outline the process of genetic engineering.</li> <li>can describe the purpose and advantages of genetic engineering using examples.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can explain and use the terms accuracy, precision, repeatability, reproducibility, range, interval and bias correctly and in any context.</li> <li>can use data to support or refute an argument or stated position.</li> </ul>	9
8	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can describe some methods used to treat infertility and evaluate these methods; considering moral, ethical and economic issues.</li> <li>can explain how the menstrual cycle is involved in fertilisation and how infertility can be affected by changes to the menstrual cycle.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can compare and contrast aerobic and anaerobic respiration.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can calculate the energy requirements of different groups of people (teenagers, the elderly, males and females).</li> <li>can describe how bacteria can aid human digestion.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can explain how leaves are adapted for efficient photosynthesis.</li> <li>can explain the importance of photosynthesis in maintaining levels of oxygen and carbon dioxide in the atmosphere.</li> <li>can evaluate the importance of insect pollinators within the ecosystem with reference to human food supply.</li> <li>can explain what is meant by bioaccumulation and suggest the effects of bioaccumulation on the ecosystem.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can discuss the roles of Watson, Crick, Wilkins and Franklin in the discovery of DNA.</li> <li>explain the process of natural selection and how this leads to evolution; with reference to variation and adaptation.</li> <li>can explain the use of gene banks to maintain biodiversity.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can present reasoned explanations, including explaining data in relation to predictions and hypotheses.</li> </ul>	8
7	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can compare and contrast plant cells to animal cells.</li> <li>can investigate methods of seed dispersal mechanisms.</li> <li>can evaluate the effects of recreational drugs on the human body, health as well as social aspects.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can explain how pressure changes during ventilation.</li> <li>can analyse data to assess the impact of exercise, asthma and smoking on the human gas exchange system.</li> <li>can recall the word equations for aerobic and anaerobic respiration.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can state and explain which muscles in the body may need to be stronger than others.</li> <li>can explain how the skeletal and muscular systems work together to form the musculoskeletal system.</li> <li>can explain the function of antagonistic muscle pairs.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can write the word-equation for photosynthesis; identifying the reactants and products.</li> <li>can explain the importance of photosynthesis for life on earth, with reference to food chains.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>can describe what is meant by continuous and discontinuous variation; giving examples of each.</li> <li>can describe the function of DNA, genes and chromosomes and explain how they are related to one another.</li> <li>can describe how gene banks may be used to maintain biodiversity.</li> <li>can describe how competition can lead to extinction.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>understands and uses IUPAC chemical nomenclature.</li> <li>can identify further questions arising from the results of an investigation.</li> <li>can apply sampling techniques.</li> </ul>	7

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6	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can label parts of cells from a diagram.</li> <li>■ can describe the functions of the main parts of animal and plant cells.</li> <li>■ can define the terms: tissue, organ and organ system.</li> <li>■ can explain how gametes are involved in fertilisation.</li> <li>■ can describe the menstrual cycle.</li> <li>■ can outline some methods of seed and fruit dispersal.</li> <li>■ can explain some effects of recreational drugs on the human body and health.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can explain how the lungs and trachea are adapted for efficient gas exchange.</li> <li>■ can describe how lung volume changes during breathing.</li> <li>■ can describe how exercise, asthma and smoking affects the human gas exchange system.</li> <li>■ can describe the commercial uses of aerobic and anaerobic respiration.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can explain how an unbalanced diet may affect the human body; with examples.</li> <li>■ can explain the process of digestion; including the role of enzymes.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can state the function of the stomata in plant leaves.</li> <li>■ can state the reactants and products of photosynthesis.</li> <li>■ can explain how organisms may be affected by changes in their environment.</li> <li>■ can draw and interpret food webs.</li> <li>■ can explain how a change in the numbers of one organism may affect another, referring to competition and predation.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can describe what is meant by inherited variation and environmental variation.</li> <li>■ can state that genetic information is inherited.</li> <li>■ can state that due to variation, some individuals within a species will be better adapted for competition.</li> <li>■ can define biodiversity.</li> <li>■ can state that gene banks are important in maintaining biodiversity.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can evaluate data showing awareness of potential sources of random and systematic error.</li> <li>■ can undertake basic data analysis including simple statistical techniques.</li> <li>■ can recognise anomalous results in data.</li> <li>■ can calculate mean data while recognising the need to exclude anomalous results from mean calculations.</li> </ul>	6
5	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can describe the process of diffusion.</li> <li>■ can give some examples of tissues and organs.</li> <li>■ can list the main parts of animal and plant cells.</li> <li>■ can state the structural adaptations of some unicellular organisms, such as flagella.</li> <li>■ can describe how some animal and plant cells are adapted for their function.</li> <li>■ can describe the functions of some reproductive tissues and organs in plants.</li> <li>■ can describe some effects of recreational drugs on the human body and health.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can state what happens to the air, ribs and diaphragm during inhalation and exhalation.</li> <li>■ can define the term 'respiration'.</li> <li>■ can state the difference between aerobic and anaerobic respiration.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can describe what is meant by a balanced, healthy diet; including the roles of the different nutrients.</li> <li>■ can carry out an investigation to measure the force of a muscle.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can state that plants use their leaves and the process of photosynthesis to make carbohydrates.</li> <li>■ can describe how organisms may be affected by changes in their environment.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can state that all organisms show variation, including within the same species and between members of different species.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can make and record observations and measurements using a range of methods for different investigations.</li> <li>■ can comment on the reliability of methods.</li> <li>■ can suggest possible improvements to an investigative technique.</li> <li>■ can work out appropriate axes and scales for graphs.</li> <li>■ can draw best-fit lines for appropriate data.</li> <li>■ knows that scientific theories develop as earlier explanations are modified to take into account new evidence.</li> <li>■ understands the importance of publishing results and peer review.</li> </ul>	5

4	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can state that cells are the 'building blocks' of living organisms.</li> <li>■ can list some equipment that may be used to observe cells.</li> <li>■ can define 'diffusion'.</li> <li>■ can describe how cells, tissues, organs and organ system are linked in multicellular organisms.</li> <li>■ can give examples of tissues and organs in the human reproductive systems.</li> <li>■ can describe the functions of some human reproductive tissues and organs.</li> <li>■ can describe what happens during pregnancy and birth.</li> <li>■ can discuss how to have a healthy pregnancy.</li> <li>■ can name some plant reproductive tissues and organs.</li> <li>■ can list some effects of recreational drugs on the human body and health.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can name some human gas exchange tissues and organs.</li> <li>■ can describe the functions of some human gas exchange tissues and organs.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can identify from a diagram: bones, muscles, cartilage, tendons and ligaments.</li> <li>■ can describe the functions of bones, muscles, cartilage, ligaments and tendons.</li> <li>■ can list the different types of joint and give an example of each joint type.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can describe how a change in the numbers of one organism may affect another.</li> <li>■ can draw and interpret simple food chains.</li> <li>■ can state the function of plant roots.</li> <li>■ can state that all organisms in an ecosystem may affect each other and are affected by changes in their environment.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can identify how animals and plants are adapted to suit their environments and that adaptation may lead to evolution.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can use simple equations to carry out calculations from results and interpret observations to identify simple patterns.</li> <li>■ can ask questions based on observations and make simple predictions.</li> <li>■ can plan a simple investigation and identify independent, dependent and control variables.</li> <li>■ can recognise some potential sources of error.</li> </ul>	4
3	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can recognise how different types of diet, exercise, drugs and lifestyle can affect the body.</li> <li>■ can describe what is meant by reproduction in plants and animals.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can explore and compare the differences between things that are living, dead or never been alive.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can name some tissues and organs in the human digestive system.</li> <li>■ can describe the functions of some tissues and organs in the human digestive system.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can describe how living things are classified into broad groups based on observable similarities or differences.</li> <li>■ can give reasons for classifying plants and animals based on characteristics.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can recognise that living things produce offspring of the same kind.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can name and use some SI units.</li> <li>■ can name some common chemicals such as water, hydrochloric acid, sodium chloride.</li> <li>■ can identify hazards and carry out a simple risk assessment.</li> <li>■ can identify simple patterns or trends from data presented in graphs.</li> </ul>	3
2	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can recognise and describe the functions of the roots, stem, leaves and flowers.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can describe the importance of exercise for humans.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can identify the main organs of the human circulatory system.</li> <li>■ can outline the functions of the heart, blood vessels and blood.</li> <li>■ can identify that humans and some other animals have skeletons and muscles for support.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can observe and describe how seeds and bulbs grow into mature plants.</li> <li>■ can recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can recognise that normally offspring vary and are not identical to their parents.</li> </ul>	<p>All of the below and...</p> <ul style="list-style-type: none"> <li>■ can present findings and draw simple conclusions from experimental data.</li> <li>■ can present observations and data using simple tables and graphs where axes and scales are provided.</li> </ul>	2
1	<p>Can...</p> <ul style="list-style-type: none"> <li>■ name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>■ identify and name some common carnivores, herbivores and omnivores.</li> </ul>	<p>Can...</p> <ul style="list-style-type: none"> <li>■ describe the basic need for air in humans.</li> </ul>	<p>Can...</p> <ul style="list-style-type: none"> <li>■ identify, draw, name and label the basic parts of the human body.</li> <li>■ say which part of the body is associated with each sense.</li> </ul>	<p>Can...</p> <ul style="list-style-type: none"> <li>■ identify and name a variety of common wild and garden plants, including evergreen trees and deciduous trees.</li> <li>■ identify the basic structure of a variety of common flowering plants.</li> </ul>	<p>Can...</p> <ul style="list-style-type: none"> <li>■ notice that animals, including humans, have offspring which grow into adults.</li> </ul>	<p>Can...</p> <ul style="list-style-type: none"> <li>■ take measurements using a range of scientific equipment, including repeat readings.</li> <li>■ draw simple, correctly-labelled scientific diagrams.</li> <li>■ follow instructions safely.</li> </ul>	1