

Year 8 Biology — Assessment Statements

Knowledge and skills across four units, matched to the KS3 National Curriculum Programme of Study

Strong	Confident	Developing	Emerging
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Unit 1: Digestion and Health

NC strands: Nutrition and digestion · Health (drugs/substance misuse) · Working Scientifically (data analysis)

Knowledge

Strong	Evaluate the consequences of dietary imbalances including obesity, starvation and deficiency diseases, using energy requirement calculations to justify conclusions; explain the role of enzymes as biological catalysts in the breakdown of carbohydrates, proteins and fats, identifying where each is produced and acts; explain the role of bacteria in the human digestive system; analyse the short- and long-term effects of alcohol and recreational drugs on behaviour, health and life processes; and use data from food labels, including kJ values, to evaluate the nutritional quality of a product.
Confident	Explain what constitutes a healthy diet, including the role of carbohydrates, lipids, proteins, vitamins, minerals, fibre and water; calculate energy requirements and compare these to food label data; describe the tissues and organs of the digestive system and explain how they are adapted to digest and absorb food; explain how enzymes act as biological catalysts; describe the importance of bacteria in digestion; and explain the effects of alcohol and drugs on the body.
Developing	Name the main food groups and describe their functions; use food label data to compare nutrient and energy content; name the main organs of the digestive system and describe their roles; state that enzymes are biological catalysts that speed up digestion and give an example; state that bacteria play a role in the digestive system; and describe some harmful effects of alcohol and recreational drugs.
Emerging	Identify the main food groups and state why the body needs them; read a value from a food label; name some organs of the digestive system; state that enzymes help break down food; and state that alcohol and drugs can harm the body.

Skills

Strong	Select and use data from food labels, including kJ values and recommended daily amounts, to construct a detailed argument about the impact of a food product on health; identify nutrients present in excess or deficiency, justify conclusions with specific data, and evaluate the reliability of food label information as evidence.
Confident	Use data from food labels, including energy values in kJ, to explain the impact of specific nutrients on the body; compare values against recommended daily amounts; identify healthier choices and justify using data, explaining the biological reason for each nutrient's impact.
Developing	Read values from a food label, including kJ content, and describe whether levels of fat, sugar, salt or energy are high or low compared to a reference value; use at least two pieces of data to support a simple conclusion about the impact of a food on health.
Emerging	Identify a named nutrient or the energy value from a food label and state whether it is high or low; make a simple statement about whether a food is healthy or unhealthy, referring to one value from the label.

Unit 2: Respiration and Photosynthesis

NC strands: Cellular respiration · Photosynthesis · Working Scientifically (graphs, data presentation)

Knowledge

Strong	Evaluate the relative advantages and disadvantages of aerobic and anaerobic respiration for the organism in different contexts; explain oxygen debt and the role of lactic acid during and after exercise; analyse the conditions for fermentation and evaluate its applications in food production and biotechnology; explain how limiting factors affect the rate of photosynthesis using the
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Skills

Strong	Plot data accurately onto a graph with correctly labelled axes and an appropriate scale; draw a smooth curve or straight line of best fit; describe and explain the trend using biological knowledge; identify anomalous results and suggest reasons; and use the graph to make a prediction beyond the data range with justification.
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	word equation, and evaluate the dependence of almost all life on Earth on photosynthetic organisms.
Confident	Write and explain the word equations for aerobic and anaerobic respiration, comparing reactants, products and energy release, and explain the implications for the organism of each; explain how breathing rate and heart rate change during exercise and describe recovery; describe fermentation by yeast and micro-organisms and give examples of applications; explain the reactants and products of photosynthesis; describe how the rate of photosynthesis is affected by light intensity, CO ₂ and temperature; and explain the role of photosynthesis in maintaining oxygen and carbon dioxide levels.
Developing	State the word equations for aerobic and anaerobic respiration and describe the differences between them in terms of reactants and products; describe how the body responds during exercise; describe what fermentation is and give an example of a micro-organism that carries it out; state the word equation for photosynthesis and describe the conditions needed; and state what is produced and why photosynthesis is important.
Emerging	State that aerobic respiration requires oxygen to release energy; state that anaerobic respiration happens without oxygen; state that exercise makes you breathe faster; state that yeast carries out fermentation; and state that plants need light, water and carbon dioxide to photosynthesise.

Confident	Plot a set of data points accurately onto a graph, choosing a suitable scale; draw a line or curve of best fit through the data; describe the trend shown using comparative language; and identify any anomalous results.
Developing	Plot data points onto a graph with a given scale and labelled axes; attempt to draw a line of best fit; and describe the overall trend using terms such as 'increases', 'decreases' or 'stays the same'.
Emerging	Plot at least one data point correctly onto a graph with axes already labelled and scaled; state whether the values on the graph go up or down overall.

Unit 3: Plants

NC strands: *Reproduction (plants)* · *Gas exchange (stomata)* · *Photosynthesis (leaf adaptations)* · *Working Scientifically (line of best fit, means)*

Knowledge

Strong	Analyse how the structure of a leaf (including stomata, mesophyll layers, vascular bundles and waxy cuticle) is adapted for both photosynthesis and gas exchange; evaluate the factors affecting the rate of transpiration and explain how these are investigated; explain the role of minerals including nitrates and magnesium in plant growth and describe deficiency symptoms; explain the full sequence from pollination through fertilisation to seed and fruit formation; compare methods of seed dispersal and interpret a quantitative investigation of a dispersal mechanism; and explain how seed structure relates to germination.
Confident	Describe the structure of a leaf and explain the function of each layer including stomata and their role in gas exchange; explain what transpiration is and describe the factors affecting its rate; explain why plants need mineral nutrients and give examples of deficiency effects; describe the structure of a flower and distinguish between wind- and insect-pollinated flowers; explain fertilisation in plants and how seeds and fruits are formed; and describe methods of seed dispersal with reference to structural adaptations.

Skills

Strong	Draw an accurate line of best fit on a scatter graph of plant data; use it to describe and explain the trend; calculate the mean from repeated data in a table and use it to compare conditions, explaining differences with reference to plant biology; identify anomalous results and suggest why they occurred; and evaluate whether the mean is a reliable measure given the spread of data.
Confident	Draw a line of best fit through plotted data points, ensuring it reflects the overall trend; describe the trend shown; calculate the mean from a set of repeated values using the formula (total / number of values); and use the mean to make a comparison between two conditions.
Developing	Attempt to draw a line of best fit on a graph, passing close to most data points; describe the general trend; calculate the mean from a small data set; and state which condition produced a higher or lower mean value.

Developing	Label a diagram of a leaf and describe the function of main layers including the stomata; describe what transpiration is and state one factor that affects its rate; state why plants need minerals and give an example of a deficiency symptom; name the parts of a flower and describe pollination; describe what happens during fertilisation in plants and how seeds are formed; and give examples of seed dispersal methods.	Emerging	Identify whether a line of best fit should slope upward or downward from a graph; add a set of values together as a first step towards calculating a mean; and state which value in a table is the highest or lowest.
Emerging	State that leaves are where photosynthesis takes place and name their main parts including stomata; state that water moves through plants by transpiration; state that plants need minerals to grow healthily; name some parts of a flower; state that fertilisation leads to seed and fruit formation; and name a method of seed dispersal.		

Unit 4: Variation and Inheritance

NC strands: *Inheritance, chromosomes, DNA and genes* · *Genetics and evolution*

Knowledge

Strong	Evaluate the contributions of Watson, Crick, Wilkins and Franklin to the discovery of DNA structure, including the significance of Franklin's X-ray crystallography; explain how heredity transmits genetic information across generations; distinguish between continuous and discontinuous variation, represent both graphically, and explain how variation drives natural selection; use Punnett squares for monohybrid crosses; and evaluate the benefits, risks and ethical implications of genetic modification, including the use of gene banks to preserve biodiversity.
Confident	Describe the structure of DNA and define genes and chromosomes; describe the contributions of Watson, Crick, Wilkins and Franklin; explain continuous and discontinuous variation with graphical representations; explain how genetic information is inherited from both parents; use Punnett squares to predict outcomes of genetic crosses; and describe genetic modification, giving examples and explaining why gene banks are important.
Developing	State that DNA is found in the nucleus and carries genetic information in genes on chromosomes; name Watson, Crick, Wilkins and Franklin; distinguish between continuous and discontinuous variation with examples; describe how characteristics are inherited; use a Punnett square for a simple genetic cross; and describe genetic modification with one example.
Emerging	State that DNA is in the nucleus and genes are sections of DNA; name some scientists involved in discovering DNA; give examples of continuous and discontinuous variation; state that offspring inherit from both parents; and state that genetic modification changes an organism's DNA.

Skills

No assessed skills for this unit.