

## Biology - Year 7 Age-related Expectations

Cells and tissues	Animal reproduction	Food and digestion	Lungs and gas exchange	Respiration	Muscles and bones (independent learning project)	Drugs and health
Identify cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope	Describe reproduction in humans, including the structure and function of the male and female reproductive systems.	Describe the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and explain why each is needed.	Explain the structure and functions of the gas exchange system in humans, including adaptations to function.	Describe aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules which enables all the other chemical processes necessary for life.	Describe the structure and functions of the human skeleton, to include support, protection, movement and making blood cells.	Research the effects of recreational drugs (including substance misuse) on behaviour, health and life processes ( <i>covered as part of pregnancy in reproduction</i> ).
Explain the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts	Explain the stages of the menstrual cycle.	Describe the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food.	Describe the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume	Write a word summary for aerobic respiration.	Explain the interaction between skeleton and muscles, including the differences in forces exerted by various muscles	
Compare the similarities and differences between plant and animal cells	Describe the formation of gametes and process of fertilisation.	Explain the role of enzymes as biological catalysts.	Evaluate the impact of exercise, asthma and smoking on the human gas exchange system.	Assess the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration.	Consider the function of muscles and give examples of antagonistic muscles.	
Explain the role of diffusion in the movement of materials in and between cells	Identify the main stages in gestation and birth.	Consider the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.		Contrast the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.		
Describe the structural adaptations of some unicellular organisms (sex cells, ciliated cells, root hair cells, blood cells etc).	Consider the effect of maternal lifestyle on the foetus through the placenta.	Calculate energy requirements in a healthy daily diet.				
Describe the hierarchical organisation of multicellular organisms (cells, tissues, organs, systems to organisms.		Explain the importance of bacteria in the human digestive system.				

## Chemistry – Year 7 Age-related Expectations

Particles	Atoms and Elements	Pure and Impure Substances	Earth and Atmosphere
Describe the different states of matter in terms of arrangements, motion and closeness of particles.	Consider atoms and molecules as particles.	Explain the concept of a pure substance	Describe the composition of the Earth.
Explain changes of state in terms of energy.	Draw and label a simple atomic model.	Use the terms saturated and solubility to describe how different substances may dissolve in water.	Recall the structure of the Earth.
Calculate density from mass and volume data.	Define the key terms atom, element, compound and molecule accurately with specific examples.	Use the key terms dissolve, solute, solvent and solution.	Describe the rock cycle and the formation of igneous, sedimentary and metamorphic rocks.
Explain diffusion in liquids and gases driven by differences in concentration.	Use chemical symbols and formulae for elements and compounds.	Undertake simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography.	Consider Earth as a source of limited resources and the efficacy of recycling.
Consider gas pressure in terms of particles and apply their understanding to different phenomena including vacuums.	Explain conservation of mass for changes of state, dissolving and chemical reactions.	Describe how to identify pure substances (from their particle models, boiling points, chromatography etc).	Describe the carbon cycle and anthropogenic contribution.
Appreciate the importance of the observation of Brownian motion in gases.	Consider chemical reactions as the rearrangement of atoms.		Recall the composition of the atmosphere
Explain the anomaly of ice-water transition in basic terms of density and the differences between water and other similar molecules (e.g., CO <sub>2</sub> ).	Use word equations to represent a chemical reaction.		Consider the production of carbon dioxide by human activity and the impact on climate.
	Identify the difference between chemical and physical changes.		

## Physics – Year 7 Age-related Expectations

Energy	Energy Transfers
Compare energy values of different foods (from labels) (kJ).	Define the term energy as the ability to do work.
Compare power ratings of appliances in watts (W, kW).	Consider energy as a quantity that can be quantified and calculated.
Calculate and compare amounts of energy transferred (J, kJ, kW hour).	Explain why the total energy has the same value before and after a change (conservation of energy)
Assess domestic fuel bills, fuel use and costs.	Compare the starting and the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures ( <i>not covered in detail: changes in positions in a field, in elastic distortions and in chemical compositions</i> ).
Compare fuels and consider renewable and non-renewable energy resources.	Explain changes with temperature in the motion and spacing of particles.
	Describe heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one through contact (conduction) or radiation; such transfers tending to reduce the temperature difference.*
	Assess the use of insulators to minimise heat transfer.*
	Explain energy transfers: e.g., changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.

## Working Scientifically – Year 7 and 8 Age-related Expectations

Scientific Attitudes	Experimental Skills and Investigations	Analysis and evaluation	Measurement
Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility.	Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience.	Apply mathematical concepts and calculate results.	Understand and use SI units and chemical nomenclature.
Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.	Make predictions using scientific knowledge and understanding.	Present observations and data using appropriate methods, including tables and graphs.	Use and derive simple equations and carry out appropriate calculations
Evaluate risks in experimental investigations including the use of CLEAPPS hazcards.	Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate.	Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions.	Undertake basic data analysis including simple statistical techniques.
	Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.	Present reasoned explanations, including explaining data in relation to predictions and hypotheses.	
	Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.	Evaluate data, showing awareness of potential sources of random and systematic error.	
	Apply sampling techniques.	Identify further questions arising from their results.	