

| Topic (s) | Autumn 1 | | Autumn 2 | Spring 1 | | Spring 2 | Summer 1 | | Summer 2 | |
|------------------------------------|--|--|---|---|---|---|---|--|--|-----------------------|
| | 9A Respiration and circulation | 9B Reactivity | 9C Engineering | Transition to GCSE | | B1 Microscopes, cells and cellular transport | C1 States of Matter and Separation techniques | P1 Motion | B2 Enzymes | C2 The Periodic table |
| Topic Objectives | Know the structure and function of organs involved in gas exchange and circulation in humans. Understand the effect of lifestyle choices, such as smoking and exercise, on health. | Develop understanding of chemical reactions and how chemists represent chemical changes using equations. | Understand the concept of pressure. Learn about practical applications of levers and hydraulics. | Consolidate understanding of plant, animal and bacterial cells structure. Describe specialised cells. Consolidate understanding of diffusion, extend to osmosis and active transport | To consolidate understanding of particle model. To explain the principles of separation techniques. | Describe the motion of an object and how it changes over time. | Consolidate understanding of role of enzymes in digestion. Learn the structure and function of enzymes. | Understand and use the currently accepted atomic model and Periodic Table. | Analyse the forces acting on an object and how they affect motion. | |
| Acquired Knowledge / Skills | Describe the structure and function of the lungs and the mechanism of breathing. Describe blood circulation in humans, including structure of the heart, blood vessels and blood components. Explain the differences between aerobic and anaerobic respiration in terms of reactants, products formed and implications for the organism. Explain the impact of exercise, asthma and smoking on the human gas exchange system. Measuring lung capacity | Understand and apply the principle of conservation of mass in chemical reactions. Write word equations to represent chemical reactions, particularly those involving metals. Write symbols and formula. Write balanced symbol equations. Describe the structure of polymers. Evaluate impact of production and disposal of plastics. Make and record observations for chemical reactions. | Identify and describe movement of levers and their function. Calculate simple moments. Describe pressure and the factors that increase or decrease the pressure acting on a surface. Calculate pressure acting on a surface. Use the particle model to explain pressure in gases and liquids. Using newton meters to measure forces. | Make slides of cells. Explain the difference between prokaryotic and eukaryotic cells and the structure of specialised plant and animal cells. Calculate magnification and image size using different units of measurement. Explain factors that increase diffusion rate. Describe and explain osmosis. Explain active transport and give examples of where it occurs. Making slides and using microscopes. Using mass change in potato chips to explain osmosis | Use particle model to represent solids, liquids and gases and to describe changes of state. Explain the difference between a pure substance and a mixture, including interpretation of melting point data. Explain methods of separation including distillation, fractional distillation and chromatography. Describe how waste and ground water can be made potable. Chromatography Distillation. | Describe the motion of objects. Use quantitative relationships between displacement, velocity and acceleration. Understand the difference between scalars and vectors. Interpret and analyse graphs of motion. Measuring speed and acceleration. Use of light gates. | Investigate and explain the effect of temperature, pH and enzyme/substrate concentration on enzyme activity. Interpret practical results for investigations into the effect of pH and temperature on enzyme activity. Identify food groups present in foods. Complete a practical to find the energy content of foods. Measuring effect of pH on enzyme activity. Food tests and burning food to determine the energy content. | Describe a simple atomic model. Describe the modern Periodic Table and how it differs from Mendeleev's version. Use ideas about atomic structure to describe the difference between Elements and between isotopes of the same element. Explain the properties of simple molecular and giant covalent structures using ideas about covalent bonding. Measuring physical properties | Represent the forces acting on an object using vector diagrams. Explain why objects accelerate or move at constant speed using Newton's 1 st Law. Use the mathematical relationship between force, mass and acceleration (Newton's 2 nd Law) Describe interactions between objects (Newton's 3 rd Law). Measuring forces | |
| Practical skill | | | | | | | | | | |
| Target Vocabulary | Respiration Breathing Diffusion Aerobic Anaerobic Lung capacity Heart Artery Vein Capillary | Chemical Reaction Equation Reactivity Displacement Symbol Formula Rate Energy Catalyst | Lever Pivot Moment Turning Pressure Atmospheric Fluid Surface Hydraulic | Magnification Eye piece Objective lens Resolution Eukaryotic Prokaryotic Flagellum Plasmid Adaptations Microvilli | Particle Cooling curve Filtration chromatography Distillation Fractional distillation Purification Potable Sedimentation Chlorination | Displacement Scalar Vector Magnitude Direction Velocity Acceleration Deceleration Gradient | Enzyme Active site Substrate Enzyme/substrate complex Collisions Denature Lock and Key Specific Calorimetry | Atom Nucleus Electron Proton Neutron Mass number Atomic number Isotope Period Group | Balanced Unbalanced Weight Contact Gravitational Friction Thrust Repulsion Attraction | |
| Assessment | 9A Key Assessed task: Lung capacity and height (evaluation) | 9B Key Assessed task: Rate of reaction (evaluation) | 9C Key Assessed task: Pressure (evaluation) | Key Assessed task Cells and microscopes End of topic B1 test | Key Assessed task Separation techniques End of topic test C1 Baseline test B-2nd go | Key Assessed task Speed limits End of topic test P1 | Key Assessed task Effect of Temperature on enzyme action End of topic test B2 | Key Assessed task Isotopes End of topic test C2 | Key Assessed task Wheelbarrow End of topic test P2 End of Year 9 test | |
| | | End of term 1 test | | | | | | | | |

Note: due to restrictions regarding practical resources, different classes will cover the topics for each term in different order. All classes will have covered the same content by the end of each term.