Physics	Working towards expected outcomes Your child is not yet making the expected progress within this course.	Working at expected outcomes Your child is achieving the expected progress for this point within the course.	Working beyond expected outcomes Your child is working beyond the expected progress for this point within the course.
Topics are listed in the order they are taught during the year. Electricity and Magnetism	Students working **towards** expected outcomes in Y8 can: • Identify components in simple electrical circuits and describe what they do. • Measure current and voltage. • Begin to describe how current flows. • Recognise that current can behave differently in series and parallel circuits. • Describe simple static electricity effects (e.g. attraction between a balloon and hair). • Name magnetic poles and describe basic attraction and repulsion. • Build a simple electromagnet with guidance and describe its use. • Begin to follow practical instructions and describe what they observed.	Students working **at** expected in Y8 can: • Explain how current behaves in series and parallel circuits, including how it splits or combines. • Measure and compare potential difference and current using standard circuit symbols and equipment. • Use the idea of resistance to describe how different materials or components affect current. • Describe how static electricity involves the movement of electrons and explain the forces between charged objects. • Draw magnetic field lines for bar magnets and use a compass to show field direction. • Explain how electromagnets work and how their strength can be changed. • Carry out experiments safely and accurately, drawing sensible conclusions from results.	Students working **beyond** expected in Y8 can: **In addition to all the skills listed under Working At for this topic, students working beyond expected outcomes can:** • Explain the relationship between current, potential difference, and resistance, and solve simple problems using these ideas. • Use scientific vocabulary confidently to describe why some materials are better conductors or insulators. • Describe how electric fields work and explain how they cause forces between objects that are not touching. • Compare electric and magnetic fields. • Describe how electromagnets are used in real-world applications and explain the basic principles behind D.C. motors. • Use results from experiments to make predictions and suggest improvements to methods.

Moving Around (Forces)	Students working **towards** expected outcomes in Y8 can:	Students working **at** expected in Y8 can:	Students working **beyond** expected in Y8 can:
	• Describe a force as a push or pull and give examples from everyday life. • Recognise when forces are balanced or unbalanced and describe how they might affect movement. • Use the idea of speed to describe how fast something moves and identify when something is speeding up or slowing down. • Identify basic trends on a distance-time graph such as stationary or steady motion. • Know that weight is a force caused by gravity acting on mass. • Describe simple turning effects and name examples such as seesaws or doors. • Recognise that levers help with lifting or moving things. • Identify where the centre of mass is likely to be and understand that wider bases give more stability.	• Describe how unbalanced forces change an object's speed or direction. • Apply F=ma to explain an object's acceleration. • Interpret and compare distance-time graphs for moving objects. • Calculate weight from mass using W=mg and explain the difference between mass and weight. • Explain how air resistance and friction oppose motion and why terminal velocity happens when forces become balanced. • Calculate simple moments using moment = force × distance and describe how balance is affected. • Explain how levers make it easier to lift or move objects, using examples from everyday contexts. • Describe how centre of mass and base width affects the stability of an object and predict what will happen if these change.	**In addition to all the skills listed under Working At for this topic, students working beyond expected outcomes can:** • Explain force interactions with confidence including action–reaction pairs and their effects on motion. • Solve multi-step problems using speed, acceleration and F=ma, including unit conversions and rearranging equations. • Evaluate how changes in mass, force or surface area affect terminal velocity in real-world scenarios. • Apply understanding of moments to solve unfamiliar problems and explain how balance can be achieved or disrupted. • Justify how and why levers and counterweights are used in practical systems, such as cranes or see-saws. • Apply knowledge of centre of mass and stability to predict outcomes in unusual contexts (e.g. sports, structures, or vehicles). • Use scientific reasoning and evidence from practical work to explain results and suggest improvements to methods.

Heating and Cooling	Students working **towards** expected outcomes in Y8 can: • Identify solids, liquids and gases and describe how their particles are arranged. • Recognise that heat moves from hot objects to cooler ones. • Describe simple differences between heat and temperature. • Give examples of heat transfer through materials or the air. • Recognise that shiny, light-coloured, or thick materials can help keep things warm. • Begin to describe how heating affects the movement of particles. • With support, describe patterns in practical results (e.g. which container stayed warmer).	Students working **at** expected in Y8 can: • Describe the behaviour and arrangement of particles in solids, liquids and gases and link this to temperature. • Explain the difference between heat and temperature, using energy and particle ideas. • Explain how conduction and convection work by describing how particles behave during energy transfer. • Describe radiation as the transfer of energy by infrared waves, not particles. • Identify good and poor conductors and insulators and explain how this links to materials and structure. • Apply knowledge of surface colour and texture to describe how objects gain or lose heat by radiation. • Describe how heat transfer links to energy balance in the Earth's atmosphere. • Explain how human activity affects energy balance and contributes to global warming.	Students working **beyond** expected in Y8 can: **In addition to all the skills listed under Working At for this topic, students working beyond expected outcomes can:** • Use particle models to explain differences in conduction, convection and radiation in detail. • Predict how different materials or surfaces will affect energy transfer by radiation based on physical properties. • Explain how convection currents form and apply this to unfamiliar systems (e.g. ocean currents, heating systems). • Evaluate insulation methods or systems using data and justify choices using energy transfer reasoning. • Describe infrared radiation in terms of wavelengths and explain how it links to remote sensing and climate models. • Explain global warming as a result of changes to energy balance and link this to the greenhouse effect. • Use scientific vocabulary fluently and explain practical methods and results with precision.

Light and Sound	Students working **towards** expected outcomes in Y8 can: • Recognise that sound is caused by vibrations and describe examples of sound sources. • Recall that light travels in straight lines and is reflected from surfaces. • Describe simple differences between light and sound (e.g. light travels faster, sound needs a medium). • Begin to describe what echoes are and where they occur. • Can name basic parts of the human ear and eye. • With support, describe what happens when light reflects or passes through a material. • Begin to recognise that waves can carry energy or information.	Students working **at** expected in Y8 can: • Describe sound as a longitudinal wave and explain that it travels at different speeds in solids, liquids and gases. • Explain that light travels as a transverse wave and that it can travel through a vacuum. • Compare how light and sound behave when reflected or absorbed. • Describe how sound is produced, detected (microphones, ear drum), and interpreted by the brain. • Use ray diagrams to model reflection and refraction in mirrors and lenses. • Describe the colour spectrum, white light and how colours are absorbed or reflected. • Use the idea of energy transfer to explain how light and sound can cause effects (e.g. heating, triggering sensors). • Describe how microphones and ultrasound use wave behaviour to transmit or detect information.	Students working **beyond** expected in Y8 can: **In addition to all the skills listed under Working At for this topic, students working beyond expected outcomes can:** • Compare longitudinal and transverse waves in terms of motion, energy transfer and examples. • Explain how wave superposition leads to effects like reinforcement and cancellation. • Predict how changes in medium affect wave behaviour (speed, direction, reflection/refraction). • Use ray models to explain imaging systems including mirrors, lenses and the pinhole camera and relate this to the eye. • Describe how waves transfer energy and information applying this to contexts like fibre optics or medical imaging. • Explain how the retina and camera sensors convert light into signals, linking this to energy absorption. • Evaluate methods for detecting sound and light and compare their sensitivity, reliability and real-world applications