Lower Peover C of E Primary School

Progression in Science under the 2014 National Curriculum

Physics

Physical Processes	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Key Questions:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
1) There are contact and non-contact forces; these affect the motion of objects.	• Can they describe and show how to make something move, e.g. push and pull?		• Can they compare how things move on different surfaces? • Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? • Can they observe how magnets attract or repel each other and attract some materials and not others?		• Can they explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and how it impacts on everyday life? • Can they identify the effects of air resistance, water resistance and friction, that act between moving surfaces?	

			• Can they compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials? • Can they describe magnets as having two poles? • Can they predict whether two magnets will attract or repel each other, depending on which poles are facing?		• Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? • Can they explain how the force of magnetism works? • Can they describe how magnetism is used in everyday objects? • Can they describe magnets as having two poles? • Can they make predictions associated with whether two magnets will attract or repel depending on which poles are facing?	
Challenges	• Can they describe and explain changes in movement as a result of an action?		• Can they investigate the strengths of different magnets and find fair ways to compare them? • Can they explain why an object will move faster if it is rolling down a hill or a slope?		• Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction) • Can they design very effective parachutes? • Can they work out how water can cause resistance to floating objects? • Can they work out how magnets are useful in an everyday context?	

					• Can they work out the link between magnets and the North and South poles?	
2) Day, night, month, seasonal change & year are caused by the position and movement of the Earth	• Can they observe changes across the four seasons? • Can they observe and describe weather associated with the seasons and how day length varies? • Do they know that the sun lights up the Earth? • Can they stay safe when observing the Sun? • Can they describe how the Sun moves across the sky?				• Can they describe the movement of the Earth, and other planets, relative to the Sun in the solar system? • Can they describe the movement of the Moon relative to the Earth? • Can they describe the Sun, Earth and Moon as approximately spherical bodies? • Can they use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky? • Can they explain how planets are linked to stars? • Can they explain how seasons and the associated weather is created?	
Challenges	• Do they know that the sun moves across the sky during the day? • Can they explain why they can't see stars in the daytime?				• Can they compare the time of day at different places on the earth? • Can they create shadow clocks?	

					• Can they begin to understand how older civilizations used the sun to create astronomical clocks? • Can they explore the work of some space pioneers? (Galileo, Copernicus, Neil Armstrong)	
3) Light & sound can be reflected & absorbed and enable us to see & hear	• Can they identify and name the sources of light? • Can they identify and name sources of light that we can see? • Can they explain what darkness is? • Can they compare sources of light? (brightest, dullest, darker, lighter) • Can they observe and describe shadows during the day?	• Can they compare the brightness and colour of lights? • Can they explain what dark is; using words like shadow? • Can they explain why their shadow changes during the day? • Can they describe different ways of making sound? • Can they explain why a sound is louder the closer they are to the source?	• Can they recognise that they need light in order to see things and that dark is the absence of light? • Can they notice that light is reflected from surfaces? • Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes? • Can they recognise that shadows are formed when the light from a light source is blocked by a solid object? • Can they find patterns in the way that the size of shadows change? • Can they explain the difference between transparent, translucent and opaque? • Can they compare the brightness and colour of lights?	• Can they identify how sounds are made, associating some of them with something vibrating? • Can they recognise that vibrations from sounds travel through a medium to the ear? • Can they recognise that sounds get fainter as the distance from the sound source increases? • Can they find patterns between the pitch of a sound and features of the object that produced it? • Can they find patterns between the volume of a sound and the strength of the vibrations that produced it? • Can they compare sources of sound and explain how the sounds differ?		• Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them? • Can they explain how the human eye sees objects? • Can they explain how different colours of light can be created? • Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope)

			• Can they explain how bulbs work in an electrical circuit?			
Challenges	• Can they describe changes in light that result from action/s? • Can they describe how light and temperature are different during the night and day?	• Can they explain why lights need to bright or dimmer according to need? • Can they explain how the loudness and pitch of sounds can be altered? • Can they explain what makes a sound louder and softer and higher and lower? • Can they explain how the loudness and pitch of sounds can be altered?	• Can they explain why lights need to be bright or dimmer according to need? • Can they say what happens to the electricity when more batteries are added? • Can they explain why their shadow changes when the light source is moved closer or further from the object?	• Can they explain why sound gets fainter or louder according to the distance? • Can they explain how pitch and volume can be changed in a variety of ways? • Can they work out which materials give the best insulation for sound?		• Can they use the ray model to explain the size of shadows?
4) Electricity can make circuits work and can be controlled to perform useful functions	• Can they identify everyday appliances which use electricity? • Can they recognise that electricity is an important source of light?	• Can they explain how bulbs work in an electrical circuit?		• Can they identify common appliances that run on electricity? Can they construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers? • Can they recognise some common conductors and insulators, and associate metals with being good conductors?		• Can the associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit? • Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches? • Can they use recognised symbols when representing a simple circuit in a diagram?

				• Can they identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery? • Can they recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit? • Can they explain how electricity is useful to us?		• Can they explain how to make changes in a circuit? • Can they explain the impact of changes in a circuit?
Challenges	• Can they explain how electricity helps us at home and at school?	• Can they make a bulb go on and off? • Can they say what happens to the electricity when more batteries are added?		• Can they explain how a bulb might get lighter? • Can they recognise if all metals are conductors of electricity? • Can they work out which metals can be used to connect across a gap in a circuit?		• Can they make their own traffic light system or something similar? • Can they explain the danger of short circuits? • Can they explain what a fuse is?