Scientific knowledge and understanding of Light Lights and shadows							Light and reflections
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Sources	P1			I know that light travels from a source (e.g. the Sun, light bulbs and torches). I know that light is needed to see things and that dark is the absence of light. I know that light from the Sun can be dangerous and how to protect their eyes.			I know that light travels in a straight line from a light source. I can understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye.
Transfers	P2			I know that all materials reflect light. I know that shadows are formed when the light from a light source is blocked by an opaque object.			I know that shiny surfaces reflect light uniformly. To know that when light is reflected off a surface, its direction changes. I know that mirrors and periscopes work using reflection of light on smooth surfaces. I understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. I understand relationships between light sources, objects and shadows.

Facts affecting energy	**P3**			I know that shadows change as a result of different factors: - Changing the position of the light source. - Changing the distances between the light source, object and surface. I know that shadows change position and length throughout the day as the Sun changes position in the sky.			I understand how and why the distance between the object and the screen affect the size of the shadow. I understand how the angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface.
Scientific knowledge and understanding of Electricity							
Sources	**P4**				I know that all electrical appliances need a power source, including batteries or mains electricity. I know that an electrical circuit needs a complete path for the electrical charge to flow through. I know the main components in a simple series circuit. I know the precautions for working safely with electricity		I know a wider variety of components in a series circuit (including buzzer and motor). I know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines.

Transfer	**P5**				I know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). I know that some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). I know that metals are used for cables and wires because they are good conductors of electricity. I know that plastic is used to cover cables and wires because it is a good insulator.		
Factors affecting energy	**P6**				I know that an open switch breaks a series circuit so the components will be off. I know that a closed switch completes a series circuit so the components will be on. I know the relationship between bulb brightness and the number of bulbs in a circuit.		I know that the voltage of a circuit can be changed and how this affects bulb brightness (or buzzer volume).

Scientific knowledge and understanding of Sound and vibrations							
Sources	P7				I know that sound is a result of vibrations		
Transfer	P8				I know that vibrations from sounds travel through mediums to the ear. I know that an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds. I know that different materials provide different amounts of insulation against sound.		
Factors affecting energy	P9				I know a variety of ways to change the pitch or volume of a sound. I know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. I know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. I know that sounds get fainter as the distance		

					from the sound source increases. To know that sounds get fainter as the distance from the sound source increases.		

Scientific knowledge and understanding of Forces, Earth and space							
		Seasonal Changes				Earth and Space	
Key Changes	P10	I know the name and order of the four seasons: spring, summer, autumn and winter. I know that it is unsafe to look directly at the Sun.				I know that the Sun is a star at the centre of our solar system. I know that the Sun, Earth and Moon are approximately spherical bodies. I know the names, order and relative positions of the planets and other main celestial bodies. I know that a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets.	
Forces in motion	P11	I know weather associated with the four seasons and how it changes (in the UK). I know that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer				I know that the Earth and other planets orbit around the Sun. I know that the tilt of the Earth and its orbit around the Sun causes the seasons. I know that the Moon orbits around the Earth.	

						I know how the Earth's rotation causes day and night and the apparent movement of the Sun across the sky.	
Scientific knowledge and understanding of Forces, Earth and space							
				Forces and Magnets		**Imbalanced Forces**	
Key facts	**P12**			I know some examples of contact and non-contact forces. I know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism). I know the North and South poles of a magnet. I know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. I know some different examples of magnets, including bar, horseshoe, button and ring, I know some uses of magnets.		I know that gravity is a non-contact force that pulls objects together. I know that air resistance and water resistance are both types of friction.	
Forces in motion	**P13**			I know that friction is a contact force that acts between two surfaces to slow an object down.		I know that unsupported objects fall towards the Earth because of gravity. I know that friction, air resistance and water resistance act in the	

				I know that magnetism is a non-contact force that affects objects containing magnetic metal. I know that the opposite poles of a magnet attract one another and like poles repel one another.		opposite direction to a moving object. I know that when forces are imbalanced, the speed, shape or direction of an object changes. I know that when forces are balanced the speed, shape or direction of an object stays the same. I know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	
Facts affecting forces	**P14**			I know that rougher surfaces have more friction between them than smoother surfaces. I know that the strength of different magnets may vary.		I know that rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. I know that the larger the surface area of an object the greater the air or water resistance it creates.	