Physics

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	Seasonal Change - observe changes across the 4 seasons - observe and describe weather associated with the seasons and how day length varies		Light recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change	Sound - identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear - find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it - recognise that sounds get fainter as the distance from the sound source increases	Earth and Space describe the movement of the Earth and other planets relative to the sun in the solar system describe the movement of the moon relative to the Earth describe the sun, Earth and moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Light Pupils should be taught to: recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
			Forces and Magnets compare how things move on different surfaces notice that some forces need contact between 2 objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others 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 describe magnets as having 2 poles predict whether 2 magnets will attract or repel each other, depending on which poles are facing	Electricity identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 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 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors	Forces explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	Electricity Pupils should be taught to: associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit 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 use recognised symbols when representing a simple circuit in a diagram

ed Standard	Seasonal Change observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies Pupil can describe the features of different seasons using correct vocabulary Pupil compares and contrasts the different seasons Pupil recognises which months are associated with different seasons Pupil can explain the different weather, light and temperature associated with each season Pupil records simple weather information on a chart or in a diary and explains the changes they observe			Sound Pupil can explain that sound becomes fainter the further you move from the sound source. Pupil can label a simple diagram of the ear to show how a sound is heard. Pupil can describe how a sound comes from a vibration travelling through a medium e.g. air to the ear, which transmits it to the brain by the auditory nerve for interpretation Pupil can explain that sound travels at different speeds through different media. Pupil can describe how to change the pitch of a sound. Pupil can describe how the volume of a sound can be changed. Pupil can suggest simple ways to create sound insulators to protect the ear from loud and/or high pitch sounds.	Earth and Space Pupil can explain that the Earth and other planets orbit the Sun. Pupil can explain that the Sun, Earth and Moon are spherical bodies. Pupil can name, place and describe the differences between the planets in the Solar system. Pupil understands that gravitational forces ensure that the orbits of planets are consistent and time taken to orbit the sun is dependent on distance from the sun. Pupil can explain that the Moon orbits the Earth noting the number of days, apparent shape and the lunar cycle. Pupil can describe how the rotation of the Earth in relation to the Sun causes day and night. Pupil can describe how the position of the Earth's orbit in relation to the Sun affects the amount of daylight and temperatures on the Earth giving us our seasons. Pupils can explain the apparent movement of the Sun during the day and its effect on shadow length.	Light Pupil can explain how light travels from a light source in straight lines. Pupil suggests ways that they can show light travels in straight lines. Pupil can describe the process whereby light travels from light sources and is reflected from objects/materials to our eyes. Pupil can label the parts of an eye and discuss how each part is involved in seeing an object from which light is reflected. Pupil can describe that we see colour because some colours are absorbed by an object when light is reflected from its surface. Pupil can describe how light is reflected by mirrors – plane; concave; convex Pupil can explain how shadows are formed and how the transparency or opaque property of an object determines the clarity of the shadow we see. Pupil explains that a shadow has the same shape as the object casting it but may be elongated or shorter depending on the position of the light source. Pupil identifies that an object looks different when observed in two media e.g. water & air Pupil can describe how the process of light reflection can be used commercially e.g. manufacture of periscope; microscope; rear view mirrors; telescopes

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			Forces and Magnets Pupil knows that for an object to move a force is applied to overcome the stationary force holding it in place and the object moves in the direction of this larger force Pupil can give reasons as to why objects may require more or less force to move over different surfaces Pupil can identify a force as a push or a pull and show the effect of these on an object in a simple drawing with explanation Pupil knows that magnets can make some objects move over surfaces without touching the object Pupil can explain that a magnet has different poles which can repel or attract each other depending on which poles are facing. Pupil can group materials as either magnetic or non-magnetic Pupil can explain some possible everyday uses for magnets	Electricity Pupil can identify appliances which run on electricity – specifying if this is mains or battery and offering simple reasons for the difference. Pupil understands that electricity is dangerous and how to keep safe when using electricity. Pupil can construct a simple series circuit with multiple components and name the different parts. Pupil can include a simple switch in a circuit and explain how it works. Pupil can devise investigations to classify materials as electrical conductors or insulators. Pupil draws simple diagrams (pictorial representation) to show the sequence of components in the circuit. Pupil can explain what happens to the brightness of a bulb if more bulbs are placed in the circuit or additional cells added.	Forces Pupil can explain the effect of gravity on objects falling towards the earth. Pupil can describe the effect of gravity on the rate at which objects of different shape will fall to the Earth. Pupil can explain that the movement of objects through air, water and across surfaces is resisted by these media. Pupil can give ideas for how the effect of air & water resistance and friction can be minimised to enable objects to move more freely through the respective media. Pupil can describe how levers, pulleys and gears work. Pupil can explain how some mechanisms can use a small force to create a big effect.	Electricity Pupil can use knowledge of symbols and circuit diagrams to create an accurate series circuit. Pupil can draw a circuit diagram using recognised symbols. Pupil can explain what happens to other components in a circuit if additional bulbs, buzzers are added but the number of cells/battery remains the same. Pupil can explain what will happen to components in a circuit if the number of cells/batteries is increased or reduced. Pupil can explain why some metals are electrical conductors and other insulators. Pupil can explain how current flows in a circuit and what happens if the current is changed or a part of the circuit does not work/function appropriately. Pupil can explain the dangers of working with electricity and the safety precautions which must be taken. Pupil can explain how electrical appliances have safety features in their circuits to prevent electrocution or electric shock.

Vocabulary	autumn; winter; spring; summer; seasons; sun; light; day; night; rain; sleet; snow; blizzard; freezing; frost; ice; rain; mist; fog; wind; temperature; hot; cold; cool; weather; forecast; clouds; thunder; lightning; environment; air;		Forces and Magnets force; push; pull; friction; magnet; magnetic; non-magnetic; North pole; South pole; repel; attract; surface; strength; pattern; resistance; direct; contact	Sound Sound; volume; pitch; vibration; medium; conduct; conductor; insulate; insulator; amplify; tuning fork; decibel; high; low; natural; man-made; echo; vacuum; sound waves; sonar; sound proof; outer ear; auditory canal; ear drum; cochlea; auditory nerve; voice box; vocal chords; larynx; tongue; hammer; anvil; stirrup. Electricity electricity; electrical appliance/device; mains; plug; electrical circuit; complete circuit; component; cell; battery; positive; negative; connect/connections; short circuit; crocodile clip; switch; bulb; buzzer; motor; conductor; insulator; metal; non-metal; symbol; electrical safety; electrocute; current; voltage; open/closed switch;	Earth and Space Sun; Moon; Earth; orbit; planets; moon; celestial body; Mercury; Venus; Mars; Jupiter; Saturn; Uranus; Neptune; Pluto (as a dwarf planet); day; night; phases; gravity; gravitational pull; Solar System; Universe; comet; colonise; explore; astronaut; rocket; space station; lunar; lunar cycle; rotate; axis; revolve; sphere; spherical; geocentric; heliocentric; constellation; full moon; gibbous moon; half moon; crescent moon; new moon; waxing moon; waning moon Forces Gravity; gravitational force; friction; force; thrust; upthrust; air resistance; water resistance; push; pull; stationary; contact force; non-contact force; buoyancy; zero gravity; motion; unsupported force; supported force; levers; pulleys; gears; springs; fulcrum/pivot; hinge; motion; particle; surface area; Mass (g & kg); Balance;	Light reflection; refraction; reflective; opaque; transparent; translucent; light source; shadow; straight; filter; prism; spectrum; optic nerve; retina; iris; lens; rods; cones; pupil; inverse; cornea; plane mirror; convex; concave; optical illusions; filament; focus; optician; luminescence; bioluminescence; incandescent; nocturnal; Infra-red light; light meter; lumens; visible; invisible; telescope; microscope; short sighted; long sighted Electricity Electrical current; circuit; series circuit; symbols; cell; battery; bulb; buzzer; motor; switches; conductor; insulator; safety precautions; electrocution; electric shock; defibrillator; open switch; closed switch; positive terminal; negative terminal; electrons; protons; static electricity; volts; voltage; watts; Ohms; resistance; amps; fuse; earth; live.
Examples	Trees around school grounds		Car friction investigation			
Scientists			Isaac Newton	Joseph Swan	Katherine Johnson (Mathematician)	
CPA			Forces model	Energy Transfer model	Forces model	Energy Transfer model