# Science Progression Document
## KS1 and KS2 Coverage from the National Curriculum (Physics)

| Year Group | FS1 | FS2 | Year 1 programme of study | Year 2 programme of study | Year 3 programme of study | Year 4 programme of study | Year 5 programme of study | Year 6 programme of study |
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| **Area** | **Understanding the World** | **Understanding the World**<br>**Physical Development** | **Seasonal changes** | | **Light** | | **Earth and space** | **Light** |
| **Statutory** | **N1 UTW**<br>• To be able to talk about the weather e.g. it is cold.<br><br>**N2 UTW**<br>• To be able to talk about the weather in more detail e.g. it is cold because the wind is blowing and it is winter. | • To talk about the changes they observe in their environment – Seasons link. (UTW)<br>• To discuss daily weather/seasons.<br>• To know and explain the signs of Autumn. (UTW)<br>• To explain about sun safety e.g. wearing sun tan cream, wearing a hat. (PD)<br>• To explain about sun safety e.g. sun tan cream, wearing a hat.<br>• To know how the weather is changed linked to the seasons (UTW) | • observe changes across the 4 seasons<br>• observe and describe weather associated with the seasons and how day length varies | | • recognise that they need light in order to see things and that dark is the absence of light<br>• notice that light is reflected from surfaces<br>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes<br>• recognise that shadows are formed when the light from a light source is blocked by an opaque object<br>• find patterns in the way that the size of shadows change | | • describe the movement of the Earth and other planets relative to the sun in the solar system<br>• describe the movement of the moon relative to the Earth<br>• describe the sun, Earth and moon as approximately spherical bodies<br>• use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky | • recognise that light appears to travel in straight lines<br>• 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<br>• 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<br>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them |

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| | | | | | | | | |
| **Non-Statutory** | | | Pupils should observe and talk about changes in the weather and the seasons.<br><br>Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. | | Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.<br><br>Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses. | | Pupils should be introduced to a model of the sun and Earth that enables them to explain day and night. Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones).<br><br>Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.<br><br>Pupils should find out about the way that ideas about the solar system have developed, | Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. |

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| | | | | | | | understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. | |
| **Working Scientifically** | | | Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change | | Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. | | Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks. | Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur). |

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| **Area** | | | **Forces and magnets** | | **Forces** | |
| **Statutory** | | | • compare how things move on different surfaces<br>• notice that some forces need contact between 2 objects, but magnetic forces can act at a distance<br>• observe how magnets attract or repel each other and attract some materials and not others<br>• 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<br>• describe magnets as having 2 poles<br>• predict whether 2 magnets will attract or repel each other, depending on which poles are facing | | • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object<br>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces<br>• recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect | |
| **Non-Statutory** | | | Pupils should observe that magnetic forces can act without direct contact, | | Pupils should explore falling objects and raise questions about the effects of air | |

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| | | | unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). | | resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement.<br><br>Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation | |
| **Working Scientifically** | | | Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are | | Pupils might work scientifically by: exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears | |

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| | | | not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. | | and/or springs and explore their effects. | |

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| **Area** | | | | **Electricity** | **(materials)** | **Electricity** |
| **Statutory** | | | | • identify common appliances that run on electricity<br>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers<br>• 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<br>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit<br>• recognise some common conductors and insulators, and associate metals with being good conductors | • Properties of materials – electrical conductors and insulators<br>• To understand what is meant by a material's property and describe a material based on these using key vocabulary. | • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit<br>• 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<br>• use recognised symbols when representing a simple circuit in a diagram |
| **Non-Statutory** | | | | Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their | | Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try |

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| | | | | circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.<br><br>Note: pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity. | | different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.<br><br>Note: pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity. |
| **Working Scientifically** | | | | Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. | | Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit. |

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| **Area** | | **Expressive Arts and Design** | | | | **Sound** | | |
| **Statutory** | | • To explore how to use voice to create high and low pitch. (EA&D) | | | | • identify how sounds are made, associating some of them with something vibrating<br>• recognise that vibrations from sounds travel through a medium to the ear<br>• find patterns between the pitch of a sound and features of the object that produced it<br>• find patterns between the volume of a sound and the strength of the vibrations that produced it<br>• recognise that sounds get fainter as the distance from the sound source increases | | |
| **Non-Statutory** | | | | | | Pupils should explore and identify the way sound is made through vibration in a range of different musical | | |

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| | | | | | | instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. | | |
| **Working Scientifically** | | | | | | Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume. | | |