KEY KNOWLEDGE PROGRESSION DOCUMENT – Science (Physics)

Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Forces	• SPN.1 know the words; push, pull, stretch, twist **(S)**	• SPR.1 know a force can have an effect on an object, (e.g. make it move) **(S)**			• SP3.1 know about, and describe, how objects move on different surfaces **(S)** • SP3.2 know that some forces need contact between two objects, but magnetic forces can act at a distance **(S)** • SP3.3 know that magnets attract and repel each other and attract some materials and not others **(S)** • SP3.4 know how to compare and group together a variety of everyday materials based on whether they are attracted to a magnet, and identify some magnetic materials **(D)** • SP3.5 know that magnets have two poles **(S)** • SP3.6 know how to predict whether two magnets will attract or repel each other, depending on which poles are facing **(D)**		• SP5.1 know that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object **(S)** • SP5.2 know the effects of air resistance, water resistance and friction that act between moving surfaces **(S)** • SP5.3 know that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect **(S)**		• SP7.1 know the difference between balanced and unbalanced forces and how they influence the movement of an object **(S)**

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Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Light	• SPN.2 know the difference between day and night **(S)**	• SPR.2 know the sun gives us natural light **(S)**			• SP3.7 know that light is needed in order to see, and that dark is the absence of light **(S)** • SP3.8 know that light is reflected from surfaces **(S)** • SP3.9 know about the danger of direct sunlight and describe how to keep protected **(S)** • SP3.10 know that shadows are formed when light from a light source is blocked by an opaque object **(S)** • SP3.11 know that the size of shadows change **(S)** and find patterns **(D)**			• SP6.1 know that light appears to travel in straight lines **S)** and use this to explain: • that objects are seen because they give out or reflect light into the eye **(S)** • why shadows have the same shape as the object that casts them **(S)** • SP6.2 know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes **(S)**	• SP7.2 know how refraction of light can occur when light travels through different objects **(S)**

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Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Electricity	• SPN.3 know some objects need electricity to work **(S)** • SPN.4 know how to keep safe around electricity **(P)**	• SPR.3 know different electricity sources, (e.g. plug, battery) **(S)**				• SP4.1 know common appliances that require electricity to function **(S)** • SP4.2 know how to construct a simple series electrical circuit **(P)**, identifying and naming its basic parts including cells, wires, bulbs, switch and buzzers **(S)** • SP4.3 know how to predict and test whether a lamp will light within a simple series circuit, based on whether the lamp is part of a complete loop with a battery **(D)** • SP4.4 know that a switch opens or closes a circuit and associate this with whether a lamp lights in a simple series circuit **(S)** • SP4.5 know some common conductors and insulators and associate metals with being good conductors **(S)**		• SP6.3 know that the brightness of a lamp or the volume of a buzzer is affected by the number and voltage of cells used in a circuit **(S)** • SP6.4 know how to 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 **(D)** • SP6.5 know which recognised symbols to use when representing a simple circuit in a diagram **(S)**	• SP7.3 know how to construct series and parallel circuits **(P)** • SP7.4 know how to measure current and potential difference within a circuit **(P)**

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Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sound	• SPN.5 know we use our ears for listening **(S)** • SPN.6 know that sounds come from different objects **(S)**	• SPR.4 know that sounds can have different volumes **(S)**				• SP4.6 know how sound is made, associating some of them with something vibrating **(S)** • SP4.7 know that vibrations from sounds travel through a medium to the ear **(S)** • SP4.8 know the patterns between the pitch of a sound and features of the object which produced it **(S)** • SP4.9 know the patterns between the volume of a sound and the strength of the vibrations that produced it **(S)** • SP4.10 know that sounds get fainter as the distance from the sound source increases **(S)**			• SP7.5 know how to read the pattern of soundwaves **(P)** • SP7.6 know different pitches and amplitudes from the soundwaves **(S)**

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Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Seasonal Change/ Earth and Space	• SPN.7 know the different types of weather, (e.g. sunny, raining, cloudy) **(S)**	• SPR.5 know the names of the four seasons **(S)**	• SP1.1 know how to observe changes across the four seasons **(P)** • SP1.2 know how to observe and describe weather associated with the seasons **(P)** • SP1.3 know how to observe and describe how day length varies **(P)**				• SP5.4 know the movement of the Earth and other planets relative to the sun in the solar system **(S)** • SP5.5 know the movement of the Moon relative to the Earth **(S)** • SP5.6 know the Sun, Earth and Moon as approximately spherical bodies **(S)** • SP5.7 know about the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky **(S)**		• SP7.7 know how gravitational forces cause the orbits of the planets and their moons **(S)** • SP7.8 know how the tilt of the of the Earth causes the seasons **(S)**

Curriculum End Points

The KKPDs are the input to the curriculum. The curriculum end points are the output. Curriculum end points capture the knowledge, skills and understanding that children should have at the end of each year. They build progressively over time so that children leave Year 6 well-prepared for the next stage of education as competent and capable scientist.

For subject leaders, they provide a clear overview of the end of year expectations for each year group, which will support the planning and assessment of the curriculum.

For teachers, they provide further clarity around what children should be able to do at the end of each year, using the knowledge they have gained from being taught the KKPDs. They support teachers to plan activities that help to develop children as effective scientists. They should be used to check what children know and how well they can apply this knowledge across the curriculum.

For children, they ensure that they receive an equitable curriculum which gives them the substantive, procedural and disciplinary knowledge needed to be successful in their future studies.

End points are taken from the National Curriculum Teacher Assessment Framework for Key Stage 1 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1125249/2018-19_teacher_assessment_frameworks_at_the_end_of_key_stage_1.pdf) and Key Stage 2 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1119094/2018-19_teacher_assessment_frameworks_at_the_end_of_key_stage_2.pdf).

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Curriculum end points	Children should be able to... Recall the knowledge specified within the KKPDs for Nursery Begin to use the correct terminology to describe the forces they have experienced Explore and identify forces, e.g: discussing floating and sinking when in the bath Understand electricity is dangerous and that some objects need it to work Distinguish between when it is day and night giving reasons why Recognise that sounds come from different objects and are heard using our ears Understand that changes happen and have an awareness of seasons and weather patterns e.g: it is hot in Summer	Children should be able to... Recall the knowledge specified within the KKPDs for Reception Recognise that there are different sources of electricity Identify the sun as a source of light Express that sounds can be different volumes Compare and talk about the changes in season over time Use vocabulary and knowledge to discuss the changes to the natural world, e.g: seasons, weather patterns etc.	Children should be able to... Recall the knowledge specified within the KKPDs for Year 1 Describe and compare seasonal changes Describe the weather associated with each season Describe how day length varies	No physics National curriculum objective in Year 2.	Children should be able to... Recall the knowledge specified within the KKPDs for Year 3 Describe the effects of simple forces that involve contact (friction) Discuss and explain that some forces can act at a distance (magnetic forces, including those between like and unlike magnetic poles) Demonstrate using a light source how shadows are formed	Children should be able to... Recall the knowledge specified within the KKPDs for Year Use simple apparatus to construct and control a series circuit, and predict how the circuit may be affected when changes are made to it Explain how a switch works in an electrical circuit Compare and contrast materials and identify if they are electrical conductors or insulators Use and explain the idea that sounds are associated with vibrations, and that they require a medium to travel through, in order to be heard Describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source	Children should be able to... Recall the knowledge specified within the KKPDs for Year 5 Describe and explain the effects of simple forces that involve contact, including air and water resistance Compare and contrast the effect of different forces on varying objects Describe that some forces act at a distance e.g., gravity Identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force Describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system Explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night	Children should be able to... Recall the knowledge specified within the KKPDs for Year 6 Confidently use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it e.g., bulb brightness Use recognised symbols to represent simple series circuit diagrams Explain that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects Demonstrate and justify how and why shadows change shape	Children should be able to... Recall the knowledge specified within the KKPDs for Year 7 Compare balanced and unbalanced forces and their effect on the movement of an object Explore the refraction of light Use apparatus to construct and control a series and parallel circuits to make measurements Understand and read soundwaves Describe how gravity and causes the orbits of the planets and moons Describe how the Earths tilt causes the seasons

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