NOTE: The Science curriculum is planned on a two-year rolling programme for EYFS/KS1 and a three-year rolling programme for Y3/4/5. Year 6 cover the content each year, therefore the Year 6 content is only shown on Year A. Please see the 'Whole School Science Programme' for more information.

YEAR C Curriculum Map Science

Ye ÿ~`ar 3

Autumn 2: Forces – magnets Autumn 2: Living things and their habitats	Spring: Properties and change of materials	Summer 1: Light Summer 2: Animals, including <u>humans</u> (stages of growth)
Links to previous Learning	**Links to previous Learning**	**Links to previous Learning**
<u>Forces: Magnetism</u> **<u>Materials</u>** I know everyday materials, including wood, plastic, glass, metal, water, and rock. I know the physical properties of a variety of everyday materials. I know that there are human-made and natural materials. **<u>Living Things and their Habitats</u>** I know the differences between things that are living, dead, and things that have never been alive I know that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other I know and can name a variety of plants and animals in their habitats, including micro-habitats I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) I know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) I can 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. (Y3 - Forces and magnets)	Explore how things work. (Nursery – Light) Talk about the differences in materials and changes they notice. (Nursery – Light) Describe what they see, hear and feel whilst outside. (Reception– Light) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) **<u>Animals including Humans: Stages of Growth</u>** (As this is a Year 5 topic, this will be developmentally appropriate for Year 3 children) I know that humans grow and change (e.g. babies, children, teenagers, adults, elderly). I know the external names for boys and girl's genitalia (PSHE) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Knowledge	**Knowledge**	**Knowledge**
<u>Forces: Magnetism:</u> **Big Question** **How does a magnet work?** **Are all materials magnetic?** I know that a force is a push or a pull. I know that when an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. I know a magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. I know the strongest parts of a magnet are the poles. I know that magnets have two poles– a north pole and a south pole. I know that if two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. I know that some forces need contact between two objects, but magnetic forces can act at a distance. I know what metal is found in a magnet I know why a magnet always point north **<u>Living Things and their Habitats</u>**	**<u>Properties and changes of materials</u>** I know that materials have different uses depending on their properties and state (liquid, solid, gas). I know that properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. I know that some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. I know that mixtures can be separated by filtering, sieving and evaporation. I know that some changes to materials such as dissolving, mixing and changes of state are reversible. I know that some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.	**<u>Light and Shadows:</u>** **Big Question** **How does light travel?** I know that we see objects because our eyes can sense light. I know that dark is the absence of light. I know that we cannot see anything in complete darkness. I know that some objects, for example, the sun, light bulbs and candles, are sources of light. I know that objects are easier to see if there is more light. I know that some surfaces reflect light. I know that objects are easier to see when there is less light if that are reflective. I know that the light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. that I need light in order to see things, and that dark is the absence of light. I know that light is reflected from surfaces. I know that light from the sun can be dangerous and that there are ways to protect their eyes. I know that shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light.

		(As this is a Year 5 topic, this will be developmentally appropriate for Year 3 children) I know that environments can change and that this can sometimes pose dangers to living things. I know that as part of their life cycle, plants and animals reproduce. I know that most animals reproduce sexually. I know that this involves two parents where the sperm from the male fertilises the female egg. I know that animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. I know that in other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. I know that some young undergo a further change before becoming adults e.g. caterpillars to butterflies. I know this is called a metamorphosis. I know plants reproduce both sexually and asexually. I know that bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. I know that gardeners may force plants to reproduce asexually by taking cuttings. I know that sexual reproduction occurs through pollination, usually involving wind or insects.				I know the size of the shadow depends on the position of the source, object and surface. **<u>Animals incl Humans: Stages of Growth</u>** (As this is a Year 5 topic, this will be developmentally appropriate for Year 3 children) **Big Question: How do humans change in their lifetime?** I know when babies are young, they grow rapidly. I know they are very dependent on their parents. I know as they develop, they learn many skills.	
		Key Skills **<u>Forces: Magnetism:</u>** **Big Question: How does a magnet work?** **Are all materials magnetic?** *<u>Working Scientifically</u>* *Engaging in practical enquiry to answer questions - Setting up simple practical enquiries, comparative and fair tests* *Recording and presenting evidence, gathering and recording data to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.* I can name a range of types of magnets and show how the poles attract and repel I can explain how a magnet works I can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets I can carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. I can explore what materials are attracted to a magnet. I can classify materials according to whether they are magnetic. I can explore the way that magnets behave in relation to each other. I can use a marked magnet to find the unmarked poles on other types of magnets. I can explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table.		**Key Skills** **<u>Properties and changes of materials</u>** **Big Question: How can we clean our dirty water? How does the temperature of tea affect how long sugar takes to dissolve?** (Updated March 2023) *<u>Working Scientifically</u>* *Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers* *Setting up simple practical enquiries, comparative and fair tests* I can investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat. I can explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate. I can investigate rates of dissolving by carrying out comparative and fair test. I can separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture. I can explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning. I can carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?		**Key Skills** **<u>Light and Shadows:</u>** **Big Question** **How does light travel?** *<u>Working Scientifically</u>* *Using straightforward scientific evidence to answer questions or to support their findings* *Identifying differences, similarities or changes related to simple scientific ideas and processes* *Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions* I can describe how we see objects in light and can describe dark as the absence of light I can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses I can define transparent, translucent and opaque I can describe how shadows are formed **<u>Animals incl Humans: Stages of Growth</u>** **Big Question: How do humans change in their lifetime?** I can explain how a baby changes physically as it grows, and also what it is able to do	

I can devise an investigation to test the strength of magnets.
I can devise an experiment to test the strength of 5 magnets, label them a-e and then test how many identical paperclips (in a chain) are attracted.
I can show results in a pictogram/bar graph and write true or false

Scientists
William Gilbert
Doctor who developed the theory of magnetism

Eric Laithwaite
(Electrical Engineer who developed the technology behind the maglev train)

Living Things and their Habitats
I can use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals.
I can compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth.
I can look for patterns between the size of an animal and its expected life span.
I can grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes.
I can take cuttings from a range of plants e.g. African violet, mint.
I can plant bulbs and then harvest to see how they multiply.
I can use secondary sources to find out about pollination.

Scientists
I can research David Attenborough's contribution to our understanding of living things and their habitats.

Vocabulary

Forces: Magnetism:
Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, **lodestone, compass, pendulum**

Living Things and their Habitats
Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings

Cultural Opportunities

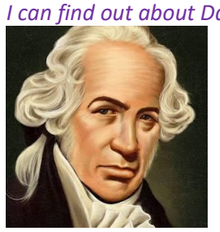
Forces: Magnetism:
TBC

Living Things and their Habitats
TBC

I can research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).

Scientist
I can find out about how Ruth Benerito created 'wrinkle-free' cotton
https://www.sciencehistory.org/historical-profile/ruth-benerito

Scientist
I can find out about Daniel Farenheit



Vocabulary

Properties and changes of materials
Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material

Cultural Opportunities

Properties and changes of materials
TBC

Light
light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, white light, visible light, colour, spectrum, refraction light source, energy, reflector, reflect, predict, investigate, reflective materials Reflect, mirror, reflection, image, concave, convex, shadow Light source, opaque, translucent, transparent, shadow, measure

Animals incl Humans: Stages of Growth
Puberty – the vocabulary to describe sexual characteristics

Cultural Opportunities

Light
https://www.scienceandindustrymuseum.org.uk/learning/schools-programme/light

Animals incl Humans: Stages of Growth

								TBC
		Key values			**Key values**			**Key values**
		School Values: Happy, Healthy and Secure. Confident and Independent. Respectful and Caring. Inspired and Excited to Learn. Teamwork. **British Values:** The rule of law. Individual liberty. Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith. Democracy. **Christian Star Qualities:** Love, Joy, Peace, Patience, Kindness, Gentleness, Self-Control, Faithfulness, Goodness.			**School Values:** Happy, Healthy and Secure. Confident and Independent. Respectful and Caring. Inspired and Excited to Learn. Teamwork. **British Values:** The rule of law. Individual liberty. Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith. Democracy. **Christian Star Qualities:** Love, Joy, Peace, Patience, Kindness, Gentleness, Self-Control, Faithfulness, Goodness.			**School Values:** Happy, Healthy and Secure. Confident and Independent. Respectful and Caring. Inspired and Excited to Learn. Teamwork. **British Values:** The rule of law. Individual liberty. Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith. Democracy. **Christian Star Qualities:** Love, Joy, Peace, Patience, Kindness, Gentleness, Self-Control, Faithfulness, Goodness.
		Book List & Resources			**Book List & Resources**			**Book List & Resources**
		Forces: Magnetism: What is a magnet? - BBC Bitesize Which metals and materials are magnetic? - BBC Bitesize Forces...tackle the tricky bits - Explorify **https://developingexperts.com/s/unit-library/units/496** **https://explorify.uk/en/activities/have-you-ever/used-a-magnet** **https://explorify.uk/en/activities/what-if/you-had-magnets-for-fingers** https://explorify.uk/en/activities/whats-going-on/mighty-magnets https://www.twinkl.co.uk/resource/tp2-s-157-planit-science-year-3-forces-and-magnets-unit-pack https://www.stem.org.uk/resources/community/collection/12391/year-3-forces-and-magnets https://www.bbc.co.uk/bitesize/articles/zg6q96f https://www.bbc.co.uk/bitesize/topics/zyttyrd https://www.bbc.co.uk/bitesize/topics/znmmn39 https://www.techagekids.com/2017/05/william-gilbert-facts-resources-kids.html **Living Things and their Habitats** Living things and their habitats - KS2 Science - BBC Bitesize Living things and their habitats...explore with your class - Explorify Developing Experts - Living things and their habitats (Year 5) https://explorify.uk/en/activities/odd-one-out/looking-after-baby			**Properties and changes of materials** **https://explorify.uk/teaching-support/teaching-science/states-of-matter-tackle-the-tricky-bits** **Developing Experts – properties of materials (Year 5)** Properties and change of materials - KS2 Science - BBC Bitesize			**Light** **Developing Experts – Light (Year 3)** Light - KS2 Science - BBC Bitesize **Explorify e.g.** Light up the dark - Explorify https://www.twinkl.co.uk/resource/tp2-s-122-planit-science-year-3-light-unit-pack https://www.stem.org.uk/resources/community/collection/12719/year-3-light https://www.bbc.co.uk/bitesize/topics/zbssgk7 https://classroom.thenational.academy/units/light-dark-250b **Animals incl Humans: Stages of Growth** **Developing Experts – Stages of Growth Year 5** **BBC bite sized -** How do humans change during their lifetime? - BBC Bitesize **Explorify e.g.** The average lifespan of a human was 200? - Explorify https://explorify.uk/en/activities/have-you-ever/noticed-how-babies-change-as-they-become-toddlers
				YEAR C				
4		**Autumn 2: Forces – magnets** **Autumn 2: Living things and their habitats**			**Spring**			**Summer**
		Links to previous Learning			**Links to previous Learning**			**Links to previous Learning**
		Forces: Magnetism: **Electricity** **Materials** I know everyday materials, including wood, plastic, glass, metal, water, and rock. I know the physical properties of a variety of everyday materials. I know that there are human-made and natural materials. **Living Things and their Habitats** I know that living things can be grouped (classified) in different ways according to their features.			**Properties and changes of materials** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 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. (Y3 - Forces and magnets)			Explore how things work. (Nursery – Light) Talk about the differences in materials and changes they notice. (Nursery – Light) Describe what they see, hear and feel whilst outside. (Reception– Light) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) **Animals including Humans: Stages of Growth**

		I know that classification keys can be used to identify and name living things. I know that living things live in a habitat which provides an environment to which they are suited (Year 2 learning). I know that these environments may change naturally e.g. through flooding, fire, earthquakes etc. I know that Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). I know that these environments also change with the seasons; different living things can be found in a habitat at different times of the year.				I know that humans grow and change (e.g. babies, children, teenagers, adults, elderly). I know the external names for boys and girl's genitalia (PSHE) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
		Knowledge		**Knowledge**		**Knowledge**
		<u>Forces: Magnetism:</u> **Big Question** **How does a magnet work?** **Are all materials magnetic?** I know that a force is a push or a pull. I know that when an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. I know a magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. I know the strongest parts of a magnet are the poles. I know that magnets have two poles– a north pole and a south pole. I know that if two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. I know that some forces need contact between two objects, but magnetic forces can act at a distance. I know what metal is found in a magnet I know why a magnet always point north **<u>Living Things and their Habitats</u>** I know that environments can change and that this can sometimes pose dangers to living things. I know that as part of their life cycle, plants and animals reproduce. I know that most animals reproduce sexually. I know that this involves two parents where the sperm from the male fertilises the female egg. I know that animals, including humans, have offspring which grow into adults. I know that in humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. I know that in other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. I know that some young undergo a further change before becoming adults e.g. caterpillars to butterflies. I know that this is called a metamorphosis. I know that plants reproduce both sexually and asexually.		**<u>Properties and changes of materials</u>** I know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. I know that materials have different uses depending on their properties and state (liquid, solid, gas). I know that properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. I know that some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. I know that mixtures can be separated by filtering, sieving and evaporation. I know that some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.		**<u>Light and Shadows:</u>** **Big Question** **How does light travel?** I know that we see objects because our eyes can sense light. I know that dark is the absence of light. I know that we cannot see anything in complete darkness. I know that some objects, for example, the sun, light bulbs and candles, are sources of light. I know that objects are easier to see if there is more light. I know that some surfaces reflect light. I know that objects are easier to see when there is less light if that are reflective. I know that the light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. that I need light in order to see things, and that dark is the absence of light. I know that light is reflected from surfaces. I know that light from the sun can be dangerous and that there are ways to protect their eyes. I know that shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. I know the size of the shadow depends on the position of the source, object and surface. **<u>Animals incl Humans: Stages of Growth</u>** **Big Question: How do humans change in their lifetime?** I know that when babies are young, they grow rapidly. I know they are very dependent on their parents. I know as they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. I know that this enables the adult to reproduce. This needs to be taught alongside PSHE

I know that bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent.
I know that gardeners may force plants to reproduce asexually by taking cuttings.
I know that sexual reproduction occurs through pollination, usually involving wind or insects.

Key Skills

<u>Forces: Magnetism:</u>
Big Question
How does a magnet work?
Are all materials magnetic?

<u>Working Scientifically</u>
Engaging in practical enquiry to answer questions - Setting up simple practical enquiries, comparative and fair tests

Recording and presenting evidence, gathering and recording data to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

I can name a range of types of magnets and show how the poles attract and repel
I can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets
I can explore what materials are attracted to a magnet.
I can classify materials according to whether they are magnetic.
I can explore the way that magnets behave in relation to each other.
I can use a marked magnet to find the unmarked poles on other types of magnets.
I can explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table.
I can devise an investigation to test the strength of magnets.
I can devise an experiment to test the strength of 5 magnets, label them a-e and then test how many identical paperclips (in a chain) are attracted.
I can show results in a pictogram/bar graph and write true or false

Scientists
<u>William Gilbert</u>*-the theory of magnetism*

I can observe that some forces need contact between two objects, but magnetic forces can act at a distance.
I can observe how magnets attract or repel each other and attract some materials and not others.
I can 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.
I can describe magnets as having two poles.
I can predict whether two magnets will attract or repel each other, depending on which poles are facing.

Key Skills

<u>Properties and changes of materials</u>
Big Question: How can we clean our dirty water? How does the temperature of tea affect how long sugar takes to dissolve?
(Updated March 2023)

<u>Working Scientifically</u>
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

Setting up simple practical enquiries, comparative and fair tests

I can investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat.
I can explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate.
I can investigate rates of dissolving by carrying out comparative and fair test.
I can separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture.
I can explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning.
I can carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?
I can research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).

<u>Scientist</u>
I can find out about how Ruth Benerito created 'wrinkle-free' cotton
https://www.sciencehistory.org/historical-profile/ruth-benerito

<u>Scientist</u>
I can find out about Daniel Farenheit

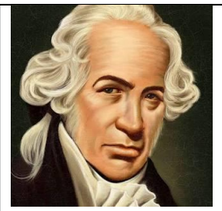
Key Skills

<u>Light and Shadows:</u>
Big Question
How does light travel?

<u>Working Scientifically</u>
Using straightforward scientific evidence to answer questions or to support their findings
Identifying differences, similarities or changes related to simple scientific ideas and processes
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

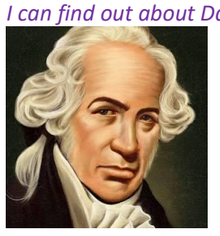
I can describe how we see objects in light and can describe dark as the absence of light
I can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses
I can define transparent, translucent and opaque
I can describe how shadows are formed

<u>Animals incl Humans: Stages of Growth</u>
Big Question: How do humans change in their lifetime?
I can explain how a baby changes physically as it grows, and also what it is able to do
I can explain the changes that takes place in boys and girls during puberty

Eric Laithwaite-*Electrical Engineer who developed the technology behind the maglev train* **Living Things and their Habitats** I can use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals. I can compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth. I can look for patterns between the size of an animal and its expected life span. I can grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes. I can take cuttings from a range of plants e.g. African violet, mint. I can plant bulbs and then harvest to see how they multiply. I can use secondary sources to find out about pollination. ***Scientists*** *I can research David Attenborough's contribution to our understanding of living things and their habitats.*		
Vocabulary	**Vocabulary**	**Vocabulary**
Forces: Magnetism: Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, lodestone, compass, pendulum **Living Things and their Habitats** Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	**Properties and changes of materials** Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	**Light** light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, white light, visible light, colour, spectrum, refraction light source, energy, reflector, reflect, predict, investigate, reflective materials Reflect, mirror, reflection, image, concave, convex, shadow Light source, opaque, translucent, transparent, shadow, measure **Animals incl Humans: Stages of Growth** Puberty – the vocabulary to describe sexual characteristics
Cultural Opportunities	**Cultural Opportunities**	**Cultural Opportunities**
Forces: Magnetism: **TBC** **Living Things and their Habitats** **TBC**	**Properties and changes of materials** **TBC**	**Light** **https://www.scienceandindustrymuseum.org.uk/learning/schools-programme/light** **Animals incl Humans: Stages of Growth** **TBC**
Key values	**Key values**	**Key values**
School Values: Happy, Healthy and Secure. Confident and Independent. Respectful and Caring. Inspired and Excited to Learn. Teamwork. **British Values:** The rule of law. Individual liberty. Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith. Democracy. **Christian Star Qualities:** Love, Joy, Peace, Patience, Kindness, Gentleness, Self-Control, Faithfulness, Goodness.	**School Values:** Happy, Healthy and Secure. Confident and Independent. Respectful and Caring. Inspired and Excited to Learn. Teamwork. **British Values:** The rule of law. Individual liberty. Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith. Democracy. **Christian Star Qualities:** Love, Joy, Peace, Patience, Kindness, Gentleness, Self-Control, Faithfulness, Goodness.	**School Values:** Happy, Healthy and Secure. Confident and Independent. Respectful and Caring. Inspired and Excited to Learn. Teamwork. **British Values:** The rule of law. Individual liberty. Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith. Democracy. **Christian Star Qualities:** Love, Joy, Peace, Patience, Kindness, Gentleness, Self-Control, Faithfulness, Goodness.
Book List & Resources	**Book List & Resources**	**Book List & Resources**
Forces: Magnetism: What is a magnet? - BBC Bitesize	**Properties and changes of materials**	**Light** **Developing Experts – Light (Year 3)**

		Which metals and materials are magnetic? - BBC Bitesize Forces...tackle the tricky bits - Explorify **https://developingexperts.com/s/unit-library/units/496** **https://explorify.uk/en/activities/have-you-ever/used-a-magnet** **https://explorify.uk/en/activities/what-if/you-had-magnets-for-fingers** https://explorify.uk/en/activities/whats-going-on/mighty-magnets https://www.twinkl.co.uk/resource/tp2-s-157-planit-science-year-3-forces-and-magnets-unit-pack https://www.stem.org.uk/resources/community/collection/12391/year-3-forces-and-magnets https://www.bbc.co.uk/bitesize/articles/zg6q96f https://www.bbc.co.uk/bitesize/topics/zyttyrd https://www.bbc.co.uk/bitesize/topics/znmmn39 https://www.techagekids.com/2017/05/william-gilbert-facts-resources-kids.html **Living Things and their Habitats** Living things and their habitats - KS2 Science - BBC Bitesize Living things and their habitats...explore with your class - Explorify Developing Experts - Living things and their habitats (Year 5) https://explorify.uk/en/activities/odd-one-out/looking-after-baby		**https://explorify.uk/teaching-support/teaching-science/states-of-matter-tackle-the-tricky-bits** **Developing Experts – properties of materials (Year 5)** Properties and change of materials - KS2 Science - BBC Bitesize		Light - KS2 Science - BBC Bitesize **Explorify e.g.** Light up the dark - Explorify https://www.twinkl.co.uk/resource/tp2-s-122-planit-science-year-3-light-unit-pack https://www.stem.org.uk/resources/community/collection/12719/year-3-light https://www.bbc.co.uk/bitesize/topics/zbssgk7 https://classroom.thenational.academy/units/light-dark-250b **Animals incl Humans: Stages of Growth** **Developing Experts – Stages of Growth Year 5** **BBC bite sized -** How do humans change during their lifetime? - BBC Bitesize **Explorify e.g.** The average lifespan of a human was 200? - Explorify https://explorify.uk/en/activities/have-you-ever/noticed-how-babies-change-as-they-become-toddlers
YEAR C						
5		**Autumn 2: Forces – magnets** **Autumn 2: Living things and their habitats**		**Spring**		**Summer**
		Links to previous Learning		**Links to previous Learning**		**Links to previous Learning**
		Forces: Magnetism **Materials** I know everyday materials, including wood, plastic, glass, metal, water, and rock. I know the physical properties of a variety of everyday materials. I know that there are human-made and natural materials. **Living Things and their Habitats** I know the differences between things that are living, dead, and things that have never been alive I know that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other I know and can name a variety of plants and animals in their habitats, including micro-habitats I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food		**Properties and changes of materials** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 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. (Y3 - Forces and magnets)		Explore how things work. (Nursery – Light) Talk about the differences in materials and changes they notice. (Nursery – Light) Describe what they see, hear and feel whilst outside. (Reception– Light) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) **Animals including Humans: Stages of Growth** I know that humans grow and change (e.g. babies, children, teenagers, adults, elderly). I know the external names for boys and girl's genitalia (PSHE) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
		Knowledge		**Knowledge**		**Knowledge**
		Forces: Magnetism: **Big Question** **How does a magnet work?** **Are all materials magnetic?**		**Properties and changes of materials** I know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. I know that materials have different uses depending on their properties and state (liquid, solid, gas).		**Light and Shadows:** **Big Question** **How does light travel?**

I know that a force is a push or a pull. I know that when an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. I know a magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. I know the strongest parts of a magnet are the poles. I know that magnets have two poles– a north pole and a south pole. I know that if two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. I know that some forces need contact between two objects, but magnetic forces can act at a distance. I know what metal is found in a magnet I know why a magnet always point north **Living Things and their Habitats** I know that environments can change and that this can sometimes pose dangers to living things. I know that as part of their life cycle, plants and animals reproduce. I know that most animals reproduce sexually. I know that this involves two parents where the sperm from the male fertilises the female egg. I know that animals, including humans, have offspring which grow into adults. I know that in humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. I know that in other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. I know that some young undergo a further change before becoming adults e.g. caterpillars to butterflies. I know that this is called a metamorphosis. I know that plants reproduce both sexually and asexually. I know that bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. I know that gardeners may force plants to reproduce asexually by taking cuttings. I know that sexual reproduction occurs through pollination, usually involving wind or insects.	I know that properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. I know that some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. I know that mixtures can be separated by filtering, sieving and evaporation. I know that some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.	I know that we see objects because our eyes can sense light. I know that dark is the absence of light. I know that we cannot see anything in complete darkness. I know that some objects, for example, the sun, light bulbs and candles, are sources of light. I know that objects are easier to see if there is more light. I know that some surfaces reflect light. I know that objects are easier to see when there is less light if that are reflective. I know that the light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. that I need light in order to see things, and that dark is the absence of light. I know that light is reflected from surfaces. I know that light from the sun can be dangerous and that there are ways to protect their eyes. I know that shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. I know the size of the shadow depends on the position of the source, object and surface. **Animals incl Humans: Stages of Growth** **Big Question: How do humans change in their lifetime?** I know that when babies are young, they grow rapidly. I know they are very dependent on their parents. I know as they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. I know that this enables the adult to reproduce. This needs to be taught alongside PSHE
Key Skills	**Key Skills**	**Key Skills**
Forces: Magnetism: **Big Question** **How does a magnet work?** **Are all materials magnetic?**	**Properties and changes of materials** **Big Question: How can we clean our dirty water? How does the temperature of tea affect how long sugar takes to dissolve?** (Updated March 2023)	**Light and Shadows:** **Big Question** **How does light travel?**

		<u>*Working Scientifically*</u> *Engaging in practical enquiry to answer questions - Setting up simple practical enquiries, comparative and fair tests* *Recording and presenting evidence, gathering and recording data to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.* I can name a range of types of magnets and show how the poles attract and repel I can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets I can carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. I can explore what materials are attracted to a magnet. I can classify materials according to whether they are magnetic. I can explore the way that magnets behave in relation to each other. I can use a marked magnet to find the unmarked poles on other types of magnets. I can explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table. I can devise an investigation to test the strength of magnets. I can devise an experiment to test the strength of 5 magnets, label them a-e and then test how many identical paperclips (in a chain) are attracted. I can show results in a pictogram/bar graph and write true or false ***<u>Scientists</u>*** ***William Gilbert*** *Doctor who developed the theory of magnetism* ***Eric Laithwaite*** *(Electrical Engineer who developed the technology behind the maglev train)* **<u>Living Things and their Habitats</u>** I can use secondary sources and, where possible, first-hand observations to find out about the life cycle of a range of animals. I can compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth. I can look for patterns between the size of an animal and its expected life span. I can grow and observe plants that reproduce asexually e.g. strawberries, spider plants, potatoes. I can take cuttings from a range of plants e.g. African violet, mint. I can plant bulbs and then harvest to see how they multiply. I can use secondary sources to find out about pollination.		<u>*Working Scientifically*</u> *Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers* *Setting up simple practical enquiries, comparative and fair tests* I can investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat. I can explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate. I can investigate rates of dissolving by carrying out comparative and fair test. I can separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture. I can explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning. I can carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced? I can research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton). ***<u>Scientist</u>*** *I can find out about how Ruth Benerito created 'wrinkle-free' cotton* https://www.sciencehistory.org/historical-profile/ruth-benerito  ***<u>Scientist</u>*** *I can find out about Daniel Farenheit* 		<u>*Working Scientifically*</u> *Using straightforward scientific evidence to answer questions or to support their findings* *Identifying differences, similarities or changes related to simple scientific ideas and processes* *Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions* I can describe how we see objects in light and can describe dark as the absence of light I can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses I can define transparent, translucent and opaque I can describe how shadows are formed **<u>Animals incl Humans: Stages of Growth</u>** **Big Question: How do humans change in their lifetime?** I can explain how a baby changes physically as it grows, and also what it is able to do I can explain the changes that takes place in boys and girls during puberty

Scientists *I can research David Attenborough's contribution to our understanding of living things and their habitats.*		
Vocabulary	**Vocabulary**	**Vocabulary**
Forces: Magnetism: Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, **lodestone, compass, pendulum** **Living Things and their Habitats** Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	**Properties and changes of materials** Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	**Light** light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, white light, visible light, colour, spectrum, refraction light source, energy, reflector, reflect, predict, investigate, reflective materials Reflect, mirror, reflection, image, concave, convex, shadow Light source, opaque, translucent, transparent, shadow, measure **Animals incl Humans: Stages of Growth** Puberty – the vocabulary to describe sexual characteristics
Cultural Opportunities	**Cultural Opportunities**	**Cultural Opportunities**
Forces: Magnetism: **TBC** **Living Things and their Habitats** TBC	**Properties and changes of materials** **TBC**	**Light** **https://www.scienceandindustrymuseum.org.uk/learning/schools-programme/light** **Animals incl Humans: Stages of Growth** **TBC**
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YEAR C						