NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

CURRICULUM STATEMENT FOR SCIENCE

Rationale:

At Nawton and Rosedale Abbey, children develop an enthusiasm for and enjoyment of science through a range of engaging and hands on activities. Their knowledge and understanding of important scientific ideas are developed, along with key processes and skills. Science plays a crucial role in developing our understanding of the world around us and our science teaching helps us to prepare children for their life through experiences and exploration of the world in which they live. Children can discover, explain and develop skills of enquiry through working scientifically.

We aim to inspire our pupils by:

- providing a range of hands on experiences in science
- encouraging children to ask and explore their own ideas
- exploring the uses and implications of science, in every-day life and the future
- exploring the work of past and current scientists and inventors

The curriculum for science aims to ensure that all pupils:

1. develop scientific knowledge and conceptual understanding in the disciplines of biology, chemistry and physics
2. develop an understanding of scientific processes and methods through different types of inquiry which answer scientific questions about the world around them
3. can use primary and secondary sources to gather information
4. can transfer recording and interpreting skills from the wider curriculum
5. are equipped with the scientific knowledge to understand the uses and implications of science in the world around them and in the future

Curriculum intent:

The intent of our science curriculum is to deliver a curriculum which is accessible for all and will provide children with the tools to ask and explore questions they have about the world around them. We endeavour to make our science lessons thought provoking and inspiring, leading children to wonder, ask questions and research and discuss their learning. We aspire to ensure that the children become successful, confident, self-led learners who enjoy the process of exploring ideas through scientific inquiry.

Curriculum implementation:

The science curriculum is delivered using a 2 year rolling timetable for Key Stage 1 to enable all of our pupils to receive their full entitlement within our mixed-age class structure. In KS2, the LKS2 and UKS2 2 year cycles run simultaneously with topics and objectives closely matched. This enables pupils in UKS2 a chance to revisit prior learning where needed and LKS2 children to extend their learning in preparation for UKS2.

The following additions have been made to the national curriculum for science:

- The Key Stage 1 topic, 'Seasonal Changes' will be revisited throughout the year as the seasons change.

In the EYFS, science is non-statutory, but is a key part of the 'Knowledge and Understanding of the World' area of the curriculum. Science is also an integral part of many areas of daily exploration, learning and play and is explored through adult-led tasks and child-initiated learning in provision areas. Children in the EYFS stage also develop the concept of working scientifically and asking scientific questions appropriate to their developmental age.

Each 2 hour session will consist of discrete teaching of scientific concept, skills and knowledge, and includes a practical enquiry where appropriate, or an activity to consolidate understanding. Children will learn about notable scientists and inventors from the past and present day. Children will also engage in child-led scientific investigation where appropriate.

In order for our pupils to know more and remember more, prior learning is always considered in the teaching of science. Revision of key facts and scientific understanding are built into lessons which allows revision to become part of good practise and ultimately helps build a depth of scientific understanding. Scientific vocabulary is built into lessons and children are encouraged to use correct terminology in discussion, explanation and writing; vocabulary is also included in displays or resources to allow for revision. Practical inquiry is built into lessons to allow children to explore their understanding of scientific concepts and to develop their scientific skills. Real world applications for the skills and knowledge being taught are indicated and famous scientists and inventors throughout history and the present day are investigated to foster a curiosity for and a love of science and other STEM subjects.

Cross-curricular links:

Science provides many links with other curriculum subjects, including:

- PE: the impact of exercise and diet on the body
- Art: scientific drawings and illustrations
- English: writing methods, explanations and conclusions for investigations
- Maths: recording results and presenting and interpreting statistics
- PSHE and SRE: the impact of diet and exercise on the body; changes in the human body, puberty and reproduction
- History: a study of important scientists from history, such as Charles Darwin and the theory of evolution

- Geography: biomes and vegetation belts

Enrichment:

The science curriculum in enriched in a variety of ways, including:

- Science workshops
- Science week
- Educational visits

Progression and Assessment:

In EYFS, children are assessed through formative assessment and their learning recoded in a floor book, which contributes to a summative assessment at the end of EYFS against the Early Years Outcomes for Understanding the World – The Natural World.

Pupils' learning in science is assessed against the learning outcomes of the National Curriculum. In KS1 and KS2 pupils' learning is assessed during and at the end of each unit and contribute to a summative assessment at the end of the phase, Reception, KS1, Y3/4 and Y5/6.

Curriculum Impact:

The impact of our science curriculum is reviewed at the end of each unit through teacher assessment of pupil's learning and pupils discussing what they have learned. Headstart science assessments may also be used to support teachers' assessment.

The science leader will monitor the science curriculum and progression of learning every half term. This monitoring will include:

- Learning environment walks
- Pupil voice conversations
- Lesson observations and feedback
- Book scrutiny
- Assessment, analysis and next steps
- Moderation with other schools

We envision our science curriculum will impact on our pupils by:

- extending their knowledge of scientific principles through knowledge gained and hands-on, practical experience
- developing a broad scientific vocabulary

- understanding practical applications of knowledge learned from scientists now and other STEM subjects
- exploring the discoveries of scientists and inventors of the past and understanding how scientific facts and phenomena were discovered

CURRICULUM COVERAGE PLAN YEAR 1 (2023/2024) – Rosedale Abbey

	AUTUMN	SPRING	SUMMER
CLASS 1	**Everyday Materials** **[Seasonal Changes – throughout year]**	**Animals Including Humans (B)**	**Plants**
CLASS 2 **Year 3&4**	**Living Things and Their Habitats (4)** **Light (3)**	**Forces and Magnets (3)** **Sound (4)**	**Rocks (3)**
CLASS 2 **Year 5&6**	**Living Things and Their Habitats (5)** **Light (6)**	**Forces (5)** **Earth and Space (5)**	**Living Things and Their Habitats (6)**

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

CURRICULUM COVERAGE PLAN YEAR 2 (2022/2023)

	AUTUMN	SPRING	SUMMER
CLASS 1	Everyday Materials Animals Including Humans (A)	Plants	Living things and their habitats
CLASS 2 Year 3 & 4	States of Matter (4) Animals Including Humans (4)	Animals Including Humans (3) Electricity (4)	Plants (3)
CLASS 2 Year 5&6	Properties and Changes of Materials (5) Animals Including Humans (4)	Animals Including Humans (5&6) Electricity (6)	Evolution and Inheritance (6)

SCIENCE CURRICULUM:

Working Scientifically		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R		Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.		I can make observations of animals and plants. I can describe events in some detail. I can learn new vocabulary. I can look at objects and pictures and talk about what I can see. I can ask questions about what I can see. I can suggest ideas for testing (not always realistic/appropriate) I can make a simple guess about what might happen next I can measure by direct comparison. I can use pictures and images to record
YEAR 1/2		During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions.	Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.	I can ask simple questions and recognising that they can be answered in different ways I can observe closely, using simple equipment I can perform simple tests I can identify and classify a range of living things I can use observations and ideas to suggest answers to questions I can gather and record data to help in answering questions.

YEAR 3/4		During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings.	Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.	I can ask relevant questions and use different types of scientific enquiries to answer them I can set up simple practical enquiries, comparative and fair tests I can make systematic and careful observations, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers I can gather, record, classify and present data in a variety of ways to help answer questions I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables I can report on findings from enquiries, including verbal and written explanations, displays or presentations of results and conclusions I can use results to draw simple conclusions, make predictions, suggest improvements and ask further questions to investigate I can identifying differences, similarities or changes when investigating I can use scientific evidence to answer questions or support my findings.

YEAR 5/6		During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments.	Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary I can take measurements, using a range of scientific equipment, with increasing accuracy and precision I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs I can use test results to make predictions to set up further comparative and fair tests I can use simple models to describe scientific ideas I can report and present findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations I can identify scientific evidence that has been used to support or refute ideas or arguments

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Plants		**NC Content:**	**Non-Statutory Guidance**	**Learning Outcomes (end point):**
R		**Early Years Outcomes** **Early Learning Goal** Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Examine change over time, for example, growing plants. Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. Pose carefully framed open-ended questions, such as "How can we…?" or "What would happen if…?". Provide stimuli and resources for children to create simple maps and plans, paintings, drawings and models of observations of known and imaginary landscapes. Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors. Give opportunities to record findings by, e.g. drawing, writing, making a model or photographing.	I can plant seeds. I can explain how to plant a seed. I can explain what happens after I plant a seed. I can explain the key features of the life cycle of a plant. I can care for growing plants. I can recognise that plants grow in different places (beds, pots, wild). I know that flowers can be similar and different (eg. colour, size) I am beginning to understand the need to respect and care for the natural environment and living things. I can explore the natural world around me I can explain the effect of the changing seasons on the natural world (eg. trees losing their leaves)
Y1		Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.	Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.	I can plant a bean. I can say three things that plants need to grow. I can find plants and identify them by a picture. I can say the names of the parts of a tree. I can match leaves I have have collected to pictures of a leaf. Scientist/explorer: Jeanne Barret – Disguised herself as a man to join an expedition to South America, Tahiti and Mauritius. Introduced around 70 new plants to Europe. First woman to sail around the world [Link to Explorers topic]
Y2		Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.	I can follow instructions to plant a seed and a bulb. I can order the life cycle of a plant. I can say how to care for a plant so it grows well. I can say examples of food crops. I can explain that plants are living things. Inventors: Tim Smit – Eden Project [could look at the differences between growing plant in a greenhouse and out of one]

Y3		Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. *Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.* Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.	Can identify and describe the functions of different parts of flowering plants: roots, stem/ trunk, leaves and flowers. Can describe the process of photosynthesis Can describe how flowering plants are pollinated, form seeds and disperse seeds. Can describe what plants need to live and grow and how they vary from plant to plant Can describe how water is transported within plants Scientist – Jane Colden (first female botanist in America) Scientist: George Washington Carver – Came up with crop rotation (what plants need to grow well) [Link to Black History]

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Animals, including Humans		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R		**Early Learning Goal** Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Examine change over time, for example, growing plants, and change that may be reversed, e.g. melting ice. Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. Pose carefully framed open-ended questions, such as "How can we…?" or "What would happen if…?". Give opportunities to record findings by, e.g. drawing, writing, making a model or photographing. Promote health awareness by talking with children about exercise, its effect on their bodies and the positive contribution it can make to their health. Encourage children to notice the changes in their bodies after exercise, such as their heart beating faster. Talk with children about the importance of hand-washing.	I can identify animals (farm, domestic, insects, wild, sea). I know that animals live in different places. I know that animals move in different ways. I can name external parts of the body (nose, ears, eyes, lips, mouth, shoulders, elbows, arms, hands, fingers, legs, knees, stomach, feet, ankles, toes). I know that humans and animals change and grow as part of their life cycle. I know that I need to do regular exercise to stay healthy. I know that I need to eat a balanced diet to stay healthy. I know when I must wash my hands to stay healthy. I know why I should brush my teeth.
Y1		Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study. Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes. Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells.	I can name the basic parts of the body. I can name the senses and say which body part is associated with each sense. I can identify and name a range of common animals. Describe the structure of common animals, including some parts of the body that are specific to animals. I can say something that is the same and something that is different about two animals. I know that animals have different diets. I can use my senses to perform simple tests. Scientist: Linda Brown Buck – discovered how humans smell Scientist: Elizabeth Garrett Anderson – First female British doctor
Y2		Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Pupils should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers	I can say which animal 'babies' will grow into. I can name some animal babies. I can say the three things that humans need, to stay alive. I can write questions and find the answers about a pet I have chosen. I can tell you which foods are healthy and which are less healthy. I can name some things that humans do to keep themselves clean. I can use a magnifying glass or microscope to look closely at my hands. Scientist: Louis Pasteur – studied germs

			to their questions.	
Y3		Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	Links to PSHE: Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out.	I can name the 6 main food groups and what they do I can plan a nutritionally balanced meal I can state the 3 jobs of the skeleton I can name which part of the skeleton protects which organs I can label the main bones of the body I know that the skeletal muscles work in pairs I can group carnivores, herbivores and omnivores Scientist: Marie Curie – Developed the use of X-ray (among other achievements)
Y4		Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey.	Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.	I can name parts of the digestive system I can identify parts of the digestive system I can construct the digestive system I can explain the functions of the digestive system I know the 4 main types of human teeth and their functions I know how the teeth of animals are adapted depending on their diet I know how to prevent tooth decay I can order a simple food chain I can identify the producer, predator and prey I can interpret a variety of food chains Scientist: Washington Sheffield – invented the first modern toothpaste
Y5		Describe the changes as humans develop to old age.	Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.	I can order the stages of human development. I can demonstrate my understanding of how babies grow in height. I can describe the main changes that occur during puberty. I can explain the main changes that take place in old age. Scientist: Leonardo da Vinci – Proportions of the human body
Y6		Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans.	Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship	I can identify the main parts of the circulatory system. I can explain the main functions of the heart, lungs and blood vessels in the circulatory system. I can explain how the digestive system breaks down nutrients and how nutrients are transported around the body I can explain what constitutes a healthy lifestyle. I can describe how drugs and alcohol can impact negatively on the body. I can take accurate measures of the pulse rate and recognise the impact of exercise on the body

			between diet, exercise, drugs, lifestyle and health.	Scientist: Marie Maynard Daly – discoveries about how cholesterol affects the heart and circulatory system Alexander Fleming – penicillin Sarah Gilbert – covid19 vaccine Daniel Hale Williams – studied the human heart

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Living Things in their Habitat		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R		**Early Learning Goal** Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Introduce vocabulary to enable children to talk about their observations and to ask questions. Encourage children to express opinions on natural and built environments and give opportunities for them to hear different points of view on the quality of the environment. Encourage the use of words that help children to express opinions, e.g. 'busy', 'quiet' and 'pollution'. Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. Pose carefully framed open-ended questions, such as "How can we…?" or "What would happen if…?". Use the local area for exploring both the built and the natural environment. Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. Provide play maps and small world equipment for children to create their own environments.	I know that different animals live in different places. I can talk about similarities and differences in relation to where animals live. I know the key features in the life cycles of some different animals I know that I should look after and care for all animals.
Y1				
Y2		Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify 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. Identify and name a variety of plants and animals in their habitats, including microhabitats. 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.	Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony	I can say what is different about things that are living, dead or have never been alive. I can identify some of the plants and animals around my school. I can find a microhabitat. I can describe the conditions in a habitat. I can ask questions about different habitats. I can describe the characteristics of some plants and animals. I can name some sources of food. Inventors: Carl Haganbeck – First zoo with spacious enclosures. George Mottorshead – First modern zoo without cages (now Chester Zoo)

			path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.	
Y3				
Y4		Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.	Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Note: Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.	I can sort living things into groups. I can generate criteria to sort living things. I can use questions to sort animals in a key. I can use similarities and differences to identify vertebrate groups. I can use a key to name invertebrates I can name some endangered species. I can say how changes to the environment have affected endangered species. Scientist: Rachel Carson – Ocean food chains and discovered that chemical pesticides from farms were affecting life in the rivers and oceans. Scientist: Gerald Durrell – conservation work to save endangered species (particularly Madagascar)
Y5		Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.	Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.	I can identify parts of a flower. I can describe the difference between sexual and asexual reproduction and identify plants and animals that reproduce asexually I can describe ways plants can be pollinated. I can identify the stages in the process of sexual reproduction. I can identify different types of mammals. I can identify familiar animals that undergo metamorphosis. I can order the stages of the life cycles of mammals, birds, insects and amphibians. Scientists: Jane Goodall and David Attenborough (naturalists) Eva Crane – Studied bees and their lifecycles

Y6		Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.	Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.	I can sort and group animals based on their features, using examples as a guide. I can name Carl Linnaeus and describe the development of his classification system. I can place animals into given groups based on certain characteristics. I can describe the characteristics of groups of organisms. I can give reasons for classifications of plants and animals Scientist: Carl Linnaeus (Classification System) Libbie Hyman – classification of invertebrates
		Evolution and Inheritance Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Note: At this stage, pupils are not expected to understand how genes and chromosomes work.	I can identify inherited traits and adaptive traits. I understand that adaptations are random mutations. I have examined fossil evidence supporting the idea of evolution. I can identify the difference between selective and cross-breeding. Scientists: Charles Darwin (Natural Selection) Barbara McClintock (Geneticist - DNA sequencing) Rosalind Franklin (DNA sequencing) Mary Leakey – evolution of humans

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Materials		**NC Content:**	**Non-Statutory Guidance**	**Learning Outcomes (end point):**
R		**Early Learning Goal** Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. Pose carefully framed open-ended questions, such as "How can we…?" or "What would happen if…?". Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.	I can explore the different properties of materials. I can talk about what I can see I can use all my senses to explore natural materials. I can explore collections of materials with similar and/or different properties. I can talk about the differences between materials
Y1	Everyday Materials	Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. Pupils might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	I can identify and name everyday materials. I can describe simple properties of everyday materials. I can sort objects 2 ways. Inventor: Ole Kirk Christiansen – inventor of Lego [link to 'Toys' topic]
Y2	Everyday Materials and their Uses	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.	I can identify and name everyday materials. I can identify different uses of everyday materials. I can show and tell how shapes of objects made from some materials can be changed. I can explain what recycling means. Inventor: Patsy Sherman – Scotch Guard Stain repellent Inventor: Charles Macintosh – waterproof fabric
Y3				

Y4				
Y5				
Y6				

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Rocks		**NC Content:**	**Non-Statutory Guidance**	**Learning Outcomes (end point):**
R				
Y1				
Y2				
Y3		Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.	Follows on from work in KS1 – Mary Anning Links to work in Geography – Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.	I can compare different types of rocks. I can group rocks based on their properties. I can explain the difference between a bone and a fossil. I can order the steps of how a fossil is formed. I can explain that soil is composed of different things. I can describe the 4 processes of soil formation. Scientist: Mary Anning (fossils) Scientist: William Smith (Father of English geology) Scientist (current): Dr Lisa White – Studies microfossils to determine the age of rocks/soil Scientist: Inge Lehmann – Discoveries about the Earth's core and the creation of indigenous rocks [Topic link – volcanoes]
Y4				
Y5				
Y6				

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

States of Matter		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R		**Early Learning Goal** Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. Pose carefully framed open-ended questions, such as "How can we…?" or "What would happen if…?". Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.	I can talk about the changes I notice. I can talk about what I see using a wide vocabulary. I can explore what is happening.
Y1				
Y2				
Y3				
Y4		Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning. Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). T hey could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	I can sort materials into solids, liquids and gases. I can explain that heating causes melting, and cooling causes freezing. I can identify the melting and freezing point of water. I can describe evaporation and condensation using practical examples. I can describe the effect of temperature on evaporation referring to their investigation. I can identify the stages of the water cycle. Scientist: Lord Kelvin – discovered absolute zero (the coldest possible temperature)
Y5		Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering,	Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.	I can identify a range of materials. I can describe the properties and everyday uses for a range of materials. I can identify thermal and electrical conductors and insulators. I can identify materials that are soluble or insoluble in water. I can use my knowledge of materials to separate mixtures. I can identify irreversible changes

		sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials. Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials	Scientists: Antoine Lavoisier and Joseph Priestly – Discovered oxygen (links to burning) Inventor: Stephanie Kwolek – invented kevlar
Y6				

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Seasonal Changes		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R		**Early Learning Goal** Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Use the local area for exploring both the built and the natural environment. Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. Give opportunities to record findings by, e.g. drawing, writing, making a model or photographing. Provide stories that help children to make sense of different environments. Provide stimuli and resources for children to create simple maps and plans, paintings, drawings and models of observations of known and imaginary landscapes. Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors.	I know that we have four seasons. I can talk about activities that I like doing during different seasons. I can talk about what I see using a wide vocabulary. I can explore the natural world around me in the different seasons. I can describe what I hear, feel and see when I am outside. I can talk about the changes to the natural world in the different seasons.
Y1		Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	Pupils should observe and talk about changes in the weather and the seasons. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. 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.	I can name the four seasons in the correct order I can name different types of weather I can describe the weather associated which each season I can tell you about changes across the seasons Scientists: Christopher Wren and Robert Hooke – Rain gauge (1662) George James Symons – New rain gauge (still used today) Francis Beaufort – Beaufort scale for measuring wind speed
Y2				
Y3				
Y4				
Y5				
Y6				

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Light		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R				
Y1				
Y2				
Y3		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.	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. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. 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.	I can identify light sources. I understand that we need light to see. I know that light travels in a straight line. I can identify reflective surfaces. I know that the Sun can damage their eyes. I know how to protect their eyes from the Sun. I understand that a shadow is formed when a solid object blocks light.
Y4				
Y5				
Y6		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.	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. 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).	I can recognise that light appears to travel in straight lines. I can describe how light enables us to see. I can describe reflection as light bouncing off a surface. I can identify some effects of refraction. I have explored colours using light. I can explain how objects block light to form shadows. Scientist: Isaac Newton – colour spectrum of light

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Forces and Magnets		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R		**Early Learning Goal** Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Pupils explore push and pull forces that involve contact Explore magnetism, allowing children so sort objects into collections of things that are/are not magnetic Explore the concept of forces such as gravity. Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of magnetic materials	I can explore collections of materials with similar and/or different properties. I can talk about what I see, using a wide vocabulary. I can explore and talk about the forces I can feel
Y1				
Y2				
Y3		Compare how things move on different surfaces. Notice that some forces need contact between two 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 two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.	Pupils should observe that magnetic forces can act without direct contact, 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). 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 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 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.	I can identify forces as pushes and pulls. I can describe friction as a force that slows objects down. I can feel the pulling force of a magnet. I can sort materials according to whether they are magnetic or not. I Participated in an investigation into magnet strength. I can identify the different poles of a bar magnet. I can use a magnetic compass with four points. Scientists: Christian Ørsted, Andre-Marie Ampere, William Sturgeon, Joseph Henry – Electro magnet (and developments to)
Y4				
Y5		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.	Pupils should explore falling objects and raise questions about the effects of air 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.	I can identify and explain the different forces acting on objects I can explain Newton's role in discovering gravity I can accurately measure an object's weight and mass I can explain the effects of air resistance, water resistance and friction I can identify streamlined shapes I have investigated the effects of friction I can explain how different mechanisms work Scientists: Sir Isaac Newton - gravity

			Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Pupils might work scientifically by: exploring falling paper cones or cup-cake 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 and/or springs and explore their effects.	
Y6				

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Earth and Space		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R				
Y1				
Y2				
Y3				
Y4				
Y5		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.	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 eight 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 one moon; Jupiter has four large moons and numerous smaller ones). Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.	I can describe a sphere. I can name the planets in the solar system. I can explain how the planets orbit the Sun. I can explain how night and day occur. I can make predictions about night and day in different places on Earth. I can explain that the Moon orbits the Earth not the Sun. Scientist: Mae Jemison – First African-American woman to go into space Neil deGrasse Tyson – Astrophysicist Margaret Hamilton – wrote the computer programmes that were on-board the Apollo 11 spacecraft Stone Henge Stephen Hawking – Black holes
Y6				

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Electricity:		NC Content:	Non-Statutory Guidance	Learning Outcomes (end point):
R				
Y1				
Y2				
Y3				
Y4		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.	Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their 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. 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. 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.	I can identify electrical and nonelectrical appliances. I can explain, with support, how a circuit works. I can name at least two electrical conductors and insulators. I can create a simple series circuit both with and without a switch. I can create an investigation on conductors and insulators I can accurately record my findings in a table. Scientist: Maria Telkes – discoveries about solar power Inventor: Garrett Morgan – the first 3 signal traffic light (and modern gas mask) Inventor: Thomas Edison – invention of many electrical items
Y5				
Y6		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.	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 different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols. 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. 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.	I know the main circuit symbols and use these to draw circuit diagrams I have planned and conducted an investigation into the effects of changing the voltage in a circuit I have investigated the variations of how components function (including the loudness of buzzers, brightness of bulbs and position of switches) Steve jobs - computers

NAWTON AND ROSEDALE ABBEY COMMUNITY PRIMARY SCHOOLS FEDERATION

SCIENCE CURRICULUM:

Sound:		**NC Content:**	**Non-Statutory Guidance**	**Learning Outcomes (end point):**
R				
Y1				
Y2				
Y3				
Y4		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.		I can describe sounds around me. I can identify high and low sounds. I can identify loud and quiet sounds. I have observed how different sounds are made. I can describe how sounds change over distance. I can participate in an investigation to find the best material for absorbing sound. I have made a musical instrument that will play different sounds. Scientist: Alexander Graham Bell – Invented the telephone
Y5				
Y6		Revisit in year 6 and build on knowledge from Y4 to bridge the gap between Y4 and KS3		I can describe sound as energy that travels in waves. I can explain how we hear sound. I can identify high and low pitch sounds, making links between the pitch, and the features of the object that is making the sound. I can use a decibel reader to measure the change in volume as the distance from a sound source increases.