Osmotherley CP Primary School
Science Curriculum

"A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes." (National Curriculum in England: Science Programmes of Study 2015)

Intent

Within the teaching of Science at Osmotherley School, we want to encourage a curiosity and fascination of the world around them. There will be an emphasis on developing and deepening scientific knowledge and 'working and thinking scientifically' will be taught throughout the content of the programme of study. There is a clear progression in the skills and knowledge taught throughout the school and deliberate practice allows children to improve fluency leading to mastery and an alteration to their long-term memory. Hands-on, practical science, using the opportunities afforded by our local environment and Forest Schools, will allow the children opportunities for deliberate practise, to further embed scientific knowledge and skills.

Implementation

Science at Osmotherley will be taught by delivering the statutorary requirements for science within the national curriculum Reception children will follow the Early Years Statutory Framework (Sept 2021) ,looking closely at the area of Understanding the World and Personal, Social and Emotional Health. The national curriculum and statutory framework provide the 'end points' to children's learning in each key stage, we have broken these end points down into small steps of progression throughout Reception, Key Stage One, Lower Key Stage Two and Upper Key Stage Two for each strand of science in our curriculum progression ladder.

Science within Key Stage 1 and 2 will be taught discreetly although opportunities for Cross Curricular links with topics may be made. Years 1 and 2 will follow their Year appropriate programme of study; Lower Key Stage 2 (Years 3 and 4) and Upper Key Stage 2 (Years 5 and 6) will follow their programmes of study as a 2 year rolling programme.

There will be and emphasis on Working Scientifically and opportunities for children to practise their literacy and numeracy skills will be made. Within both Key Stages, assessment of children's prior knowledge will be set at the beginning of each topic through an assessment activity.

Each unit is taught in small sequenced steps to ensure that the children's working memory is not overloaded and opportunities for deliberate practise are planned to ensure that essential knowledge is committed to their long term memories. Essential knowledge, including key vocabulary, is shared with pupils, parents and carers each term.

Impact

At the end of the unit, spaced recalls at 2, 6 and 12 weeks are used to assess the essential knowledge that the children are expected to remember. This essential knowledge is shared with parents and carers at the start of each learning unit. Individual children who have gaps in key essential knowledge after the week 12 recall, have 5 minute keep up sessions with a member of staff to address the gaps.
Monitoring of science is conducted by the subject leader, the headteacher and the governors through lesson visits, book scrutiny, pupil voice interviews and analysis of essential knowledge gaps.

Science Curriculum Progression and End Points

EYFS (Reception): (Taken from Early Adopters handbook 2020/21.)

UNDERSTANDING THE WORLD:

The Natural World ELG
Children at the expected level of development will:
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.

PERSONAL, SOCIAL AND EMOTIONAL DEVELOPMENT

Managing Self ELG
Children at the expected level of development will:
Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

KEY STAGE ONE (Years 1 and 2): (Taken from National Curriculum 2014)

"The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1."
(Science Programme of Study 2014)

LOWER KEY STAGE TWO (Years 3 and 4).

"The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge."
(Science Programme of Study 2014).

UPPER KEY STAGE TWO (Years 5 and 6)

"The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly."
(Science Programme of Study 2014).

HIGHTLIGHTS ARE NON-STATUTORY LEARNING.

During their Reception Year,
Children will be given opportunities to:
Explore their school environment and look how it changes through the seasons.
Explore, ask questions and begin to talk about some similarities and differences they find in the natural world around them.
Make observations and draw pictures of animals and plants.
Begin to talk about materials and changing states of matter.

Begin to talk about sound.
Begin to talk about light.
Begin to talk about magnets.
Begin to talk about how to keep themselves clean e.g. hand washing routines and brushing teeth.
Begin to talk about healthy food choices.

They will leave their Reception Year knowing:
The names of the 4 seasons.
Names of parts of their body and names of animal body parts.
Names of the parts of plants.
That changing ice into water is called **melting.**
That changing water into ice is called **freezing.**
Names of some materials which are solids or liquids
Know the difference between floating and sinking.
Know magnets are attracted to some metals and each other.
Know light can travel through transparent materials.
Know that if you block light it makes a shadow.
Know that sound can make objects vibrate.
Know a tadpole changes into a frog.
Know a caterpillar changes into a butterfly.
Why keeping clean is important e.g. handwashing, brushing teeth.
Names of some healthy foods.

Within Key Stage 1:
The children will be given opportunities to:
Develop their understanding of scientific enquiry through being 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.

They will leave Key Stage 1 with this key knowledge:

Plants

- identify and name a variety of common wild and garden plants, (e.g. daisy, nettle, grass, dandelion, daffodil, rose).
- Identify and name deciduous and evergreen trees, (e.g. oak, horse chestnut, fir, holly).
- identify and describe the basic structure of a variety of common flowering plants, including trees.
- Name what seeds need to germinate and grow.
- Know that there are flowering plants and non-flowering plants e.g. ferns.

Seasonal changes

- Name and describe changes across the 4 seasons.
- Describe weather associated with the seasons and say how day length varies.

Animals, including humans

- 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.
- Name 4 baby animals and their adult parents.
- Name the basic needs of animals, including humans, for survival (air, water, food and shelter).
- Name some healthy foods and group foods into dairy, fruit and vegetables, meat and fish, carbohydrates.
- Say how humans can keep clean and physically fit.

Everyday materials

- Name 6 different types of materials, (wood, plastic, glass, metal, water, and rock).
- Name at least 2 simple physical properties of a variety of everyday materials.
- Group everyday materials according to their simple physical properties.
- Say why a material is suitable for its particular use.
- Name some ways a solid material can be changed.

Living things and their habitats

- Recognise things that are living, dead, and things that have never been alive.
- Name at least 2 habitats and at least 2 animals and plants which they would find there.
- Name a food source for a given animal and explain what a food chain shows.

Within Lower Key Stage 2:

The children will be given opportunities to:
Expand on the knowledge that they have learnt in Key Stage 1.
Broaden and deepen their knowledge of the world through working scientifically. They 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.

They will leave Lower Key Stage 2 with this key knowledge:

Plants

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- Know plants need air, light, water, nutrients from soil, and room to grow.
- Know water is transported from the roots up the stem and into the leaves/flower.
- Know flowers are the reproductive part of the plant.
- Know non-flowering plants do not produce seeds.

Rocks

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Know how sedimentary rocks are made.
- 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.
- Know who Mary Anning was.

Animals, including humans

- Know 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.
- Describe the simple functions of the basic parts of the digestive system in humans.
- Identify food groups I.e. proteins, carbohydrates, fats and oils, vitamins and minerals.
- Plan a balanced/healthy meal.
- Draw a food chain and identify the producer, consumer, predator, prey.
- Name 2 types of teeth in humans or other animals and say what they are used for.
- Say 2 ways to look after your teeth.
- Know what a vertebrate is.
- Say why humans and some other animals have skeletons and muscles for support, protection and movement.
- Name the main bones in the human body.
- Name a hinge joint/ball and socket joint.

Light

- Recognise that they need light in order to see things and that dark is the absence of light.
- Notice that light is reflected from surfaces.
- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
- Recognise that shadows are formed when the light from a light source is blocked by an opaque object.
- Recognise and use the terms, transparent, translucent and opaque.

Forces and magnets

- Compare how things move on different surfaces.
- Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.
- Observe how magnets attract or repel each other and attract some materials and not others.
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials.
- Describe magnets as having 2 poles.
- Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.

Living things and their habitats

- Recognise that living things can be grouped in a variety of ways.
- Know what a vertebrate and invertebrate is.
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

- Know what vertebrates and invertebrates are.
- Know that insects are invertebrates and have 6 legs.
- Recognise that environments can change and that this can sometimes pose dangers to living things.
- Know who Greta Thunberg is.

States of matter

- 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.

Sound

- Identify how sounds are made, associating some of them with something vibrating.
- Recognise that vibrations from sounds travel through a medium to the ear.
- Find patterns between the pitch of a sound and features of the object that produced it.
- Find patterns between the volume of a sound and the strength of the vibrations that produced it.
- Recognise that sounds get fainter as the distance from the sound source increases.

Electricity

- Identify common appliances that run on electricity.
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
- Recognise some common conductors and insulators, and associate metals with being good conductors.
- Know who Thomas Edison was.

Earth and space (Y5/6 topic taught early)

- 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.
- Know it is not safe to look at the sun.
- Know who Dr Maggie Aderin-Pocock is.

Within Upper Key Stage 2

The children will be given opportunities to:

Expand on the knowledge that they have learnt in Lower Key Stage 2.
Broaden and deepen their knowledge of the world through working scientifically. They 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 a 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.

They will leave Upper Key Stage 2 with this Key Knowledge:

Plants

- Know flowers are the reproductive part of the plant and describe a method of pollination, seed formation and seed dispersal.

Living things and their habitats

- 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.
- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.
- Name these classification groups: plants, micro-organisms, vertebrates, invertebrates, reptiles, amphibians, mammals, fish and birds.
- Give reasons for classifying plants and animals based on specific characteristics.
- Know that Carl Linneaus developed the classification of living things.

Animals, including humans

- Describe the changes as humans develop to old age.
- Describe what happens in puberty to human bodies.
- 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 body's function.
- Say how the different food groups are used by our bodies.
- Describe the ways in which nutrients and water are transported within animals, including humans.

Forces

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.
- Know that Sir Isaac Newton taught about gravity and forces

Properties and changes of materials

- 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, 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.

Earth and space

- Describe the movement of the Earth and other planets relative to the sun in the solar system.
- Name the 8 planets found in our solar system.
- Describe the movement of the moon relative to the Earth.
- Know how our knowledge of the solar system has changed over time e.g. Galileo, Aristotle.

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.
- Know who Darwin was and that he wrote the Theory of Evolution

Light

- 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.
- Know that Alhazan is called the father of optics, (the study of light).

Electricity

- 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.

SCIENCE CURRICULUM: PROGRESSION THROUGH THE NATIONAL CURRICULUM

	Early Years Reception Expected	**Key Stage 1 Years 1 Expected**	**Key Stage 1 Year 2 Expected**	**Lower Key Stage 2 Years 3 and 4 Expected**	**Upper Key Stage 2 Years 5 and 6 Expected**
WORKING SCIENTIFICALLY (Taught throughout the year)	**Ask** questions and **listen** to answers. **Observe** closely including using magnifying glasses. **Draw** pictures of what they see. **Talk** about objects, animals, materials, the world around them.	**Ask** simple questions and recognising that they can be answered in different ways. **Observe** closely, using simple equipment. **Make** observational drawings and label them. **Perform** simple tests identifying and grouping.	**Ask** simple questions and recognising that they can be answered in different ways. **Observe** closely, using simple equipment. **Make** observational drawings and label them. **Perform** simple tests identifying and classifying using their observations and ideas	**Ask** relevant questions and using **different types of scientific enquiries** to answer them. **Set up** simple practical enquiries, comparative and fair tests. **Make** systematic and careful observations. **Take** accurate measurements using standard units, using a range of equipment.	**Plan different types of scientific enquiries to answer questions.** **Recognise and control variables** where necessary. **Take** measurements, using a range of scientific equipment, with increasing accuracy and precision. **Take** repeat readings when appropriate.

		Gather and record data to help in answering questions. .	to suggest answers to questions. **Gather and record data** to help in answering questions.	**Gather, record, classify and present data** in a variety of ways to help in answering questions. **Record findings using simple scientific language,** drawings, labelled diagrams, keys, bar charts, and tables. **Report on findings** from enquiries. **Present results and conclusions** **Make predictions** for new values, suggest improvements and raise further questions. **Use straightforward scientific evidence** to answer questions or to support their findings.	**Record data and results** of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. **Use test results to make predictions.** **Set up further comparative and fair tests.** **Report and present findings from enquiries,** including conclusions, causal relationships and explanations of and a degree of trust in results. **Identify scientific evidence** that has been used to support or refute ideas or arguments.

Working Scientifically Vocabulary	Question, observe, draw, talk about, describe, think (verbal).	Questions, observe, draw, label, test, record, science enquiry, observe over time, identify and classify.	Questions, observe, draw, label, test, record, science enquiry, observe over time, identify, group and classify.	Scientific enquiry, observation over time, identifying and classifying, pattern seeking, Research, comparative and fair testing, Observe, label, drawings, labelled diagrams, keys, bar charts, tables, question, prediction, method, results, conclusion, evidence.	Scientific enquiry, observation over time, identifying and classifying, pattern seeking, Research, comparative and fair testing, variables, independent, dependent, control. Observe, label, drawings, labelled diagrams, keys, tables, question, prediction, method, results, conclusion, evidence. classification key, scatter graph, bar graph, line graph, repeat, trust,
Seasonal Changes	**Name** the 4 seasons. **(Taught throughout year)**	**Name** the order of the 4 seasons. **Know** the weather associated with each season. **(Taught throughout year)**	**Know** how the day length changes across the 4 seasons (From Y1). **(Taught throughout year)**		
Seasonal Changes Vocabulary	Spring, summer, autumn, winter.	Spring, summer, autumn, winter, weather, cold, hot,	Spring, summer, hot, cold, autumn, winter, weather, rainy, cloudy,		

		rainy, cloudy, misty, sunny, icy, snow.	misty, sunny, icy, day, snow, night, long, short.		
Plants	**EYFS** **Name parts of plant:** flower, root, leaf. **Name parts of a tree:** branches, leaves. **(Taught Summer 1)**	**YEAR 1** **Identify and name a variety of common plants including deciduous and evergreen trees:** Nettle, grass, daffodil, Oak tree, fir tree. **(Taught in Forest Schools throughout the year)** **Name parts of plant:** flower, root, stem, leaf **(Taught Summer 1)**	**YEAR 2** **Observe and describe** how seeds and bulbs grow into plants. **Name parts of tree:** leaves, branch, trunk, roots, blossom, fruit. **Know** that plants need water, air and light to grow. **(Taught Summer 1)**	**LKS2** **Describe** the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. **Know** plants need air, light, water, nutrients from soil, and room to grow. **Know** water is transported from the roots up the stem and into the leaves/flower. **(Taught in Year B Summer 1)**	**UKS2** **Know** flowers are the reproductive part of the plant and describe a method of pollination, seed formation and seed dispersal (from LKS2). **(Taught in Year B Summer 1)**
Plants vocabulary	Flower. Root, leaf Branches, leaves.	Nettle, grass, daffodil, oak, fir tree. Flower, root, leaf, stem.	Seed, bulb. Water, air, light, grow. Leaves, branch, trunk, roots, blossom, frui.t	Function, flowering plant, roots, stem, leaves, flower. Seed, germination, air, light, water, nutrients, soil, warmth.	Reproduction, pollination, (wind, insect), seed formation, seed dispersal (explosion, wind, animal).

Animals and humans	**EYFS** **Name** some common animals e.g. pets. **Name** body parts of animals e.g. Head, ears, nose, legs, tail. **Name** basic human body parts. **(Taught Autumn)**	**YEAR 1** **Identify, name, draw and label** the basic parts of the human body and say which part of the body is associated with each sense. **Identify and name** a variety of common animals including fish, birds and mammals amphibians, reptiles. **Describe and compare** the structure of a variety of common animals (fish, birds and mammals including pets) amphibians, reptiles. **(Taught Autumn)**	**YEAR 2** **Name** 4 baby animals and their adult parents. **Order** simple stages of human lifecycle i.e. baby, child, adult. **Name** the basic needs of animals, including humans, for survival (water, shelter, food and air). **Name** some healthy foods and group foods into dairy, fruit and vegetables, meat and fish, carbohydrates. **Say** how humans can keep clean (hygiene) and physically fit (exercise). **(Taught Summer 2)**	**LKS2** **Identify** the different types of teeth in humans and their simple functions. **Identify** that humans and some other animals have skeletons and muscles for support, protection and movement. **(Taught in Year A Autumn 2)**	**UKS2** **Recognise** the impact of diet, exercise, drugs and lifestyle on the way their bodies function. **Describe** the changes as humans develop to old age. **(Taught in Year A Autumn 2)**
				Construct and interpret a variety of food chains, identifying producers, predators and prey **.** **Describe** the simple functions of the basic parts of the digestive system in humans. **Identify** that animals, including humans, need the right types and amount of nutrition, and that they	**Identify and name** the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. **Describe** the ways in which nutrients and water are transported within animals, including humans .

				cannot make their own food; they get nutrition from what they ea.t **(Taught in Year B Spring 2)**	**Describe** what happens in puberty to human bodies. **(Taught in Year B Spring 2)**
Animals and humans vocabulary	(Verbal) cat, dog, goldfish, hamster, sheep, cow, rabbit, head, ears, nose, tail, body, legs, mouth, shoulders, knees, toes, hands.	Carnivores, herbivores and omnivores, animals, fish, amphibians, reptiles, birds, mammals, pets, grow, human body, senses, touch, hear, see, smell, taste,.	Lifecycle, stages, baby, child, adult, parent, elderly, water, food and air, healthy, dairy, fruit and vegetables, meat and fish, carbohydrates. hygiene, exercise.	Teeth, incisors, canines, molars, chew, bite, grind, enamel, gums, jaw, skeleton, bones, joints, hinge, ball and socket, fixed, protect, shape, movement, muscles, skull, spine, vertebra, pelvis. digestive system, function, mouth, tongue, teeth, stomach, small intestines, large intestines, anus, incisors, canines, pre-molars, molars, enamel, food chains, producers, predators and prey.	Diet, protein, carbohydrates, vitamins and minerals, fats and oils, fibre, nutrients, exercise, drugs, medicine, lifestyle, health, aging, foetus, baby, toddler, child, adolescent, puberty, adult, elderly. Circulatory system, function, heart, pump, veins, arteries, oxygen, oxygenated blood, de-oxygenated blood, lungs, Nutrients, water, transport, digestive system, urinary system, plants, adolescent, puberty, changes, hormones, body, male, female, reproductive organs.

Living things and their habitats	**EYFS** **Talk** about some animals and plants they find in the school and forest school environment. **(Taught throughout the year in Foret Schools)**	**Year 1** **(YEAR 1 – Taken from Animals and Humans for further learning)** **Identify and name** a variety of common animals including amphibians and reptiles. **Describe and compare** the structure of a variety of common animals (amphibians and reptiles). **Identify and name** a variety of common animals that are carnivores, herbivores and omnivores. **(Taught Summer 2)**	**Year 2** **Name** at least 2 habitats and at least 2 animals and plants which they would find there. **Recognise** things that are living, dead, and things that have never been alive. **Name** a food source for a given animal and explain what a food chain shows. **(Taught Summer 2)**	**LKS2** **Recognise** that living things can be grouped in a variety of ways. **Explore and use** classification keys to help group, identify and **(Taught in Year A Summer 2)**	**UKS2** **Describe** how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. **Name these classification groups**: plants, micro-organisms, vertebrates, invertebrates, reptiles, amphibians, mammals, fish and birds. **Give reasons** for classifying plants and animals based on specific characteristics. **Know** who Carl Linnaeus was and his work on classification.

					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. **(Taught in Year A Summer 2)**
				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 Know who Greta Thunberg is. **(Taught in Year B Summer 2)**	**Describe** how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, focusing on micro-organisms, **Name these classification groups**: micro-organisms, **(Taught in Year B Summer 2)**

Living things and their habitats	(Verbal) Animals, plants, live, tree.	Carnivores, herbivores and omnivores, animals, fish, amphibians, reptiles, birds, mammal.	Animal, mini-beast, plant, habitat, woodland, field, river, alive, dead, never alive, food source, food chain.	Living things, animals, plants, group, classification, key, Vertebrates, invertebrates, Insects. identify, habitats, environment, destroy, harm.	Living things, animals, plants, micro-organisms, virus, bacteria, mammals, reptiles, amphibians, fish, birds, invertebrates, vertebrates, arthropods, group, classification, key, identify, characteristics, reproduction, lifecycle, stages.
Materials	**Natural Processes** **Name** some materials which are solids or liquids. **Say** melting is when ice changes to water. **Say** freezing is when water changes to ice. **Name** a property of a given material	**Materials and their properties** **Name** 6 different types of materials, (wood, plastic, glass, metal, water, and rock). **Name** at least 2 simple physical properties of a variety of everyday materials. **Group** everyday materials according to	**Materials and their properties Materials and their properties** **Say** why a material is suitable for its particular use. **Name** some ways a solid material can be changed. **(Taught Spring 1)**	**States of matter** **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).	**Properties and changes of materials** **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 . **Give reasons,** based on evidence from

	Group materials which can float or sink. **(Taught Autumn 2 and Spring 1)**	their simple physical properties. **(Taught Spring 1)**		**Identify** the part played by evaporation and condensation in the water cycle. **Associate** the rate of evaporation with temperature. **(Taught in Year B Spring 1)**	comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. **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, sieving and evaporating. **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. **(Taught in Year B Spring 1)**
Materials Vocabulary	(Verbal) Solid, wood, stone, plastic, metal, glass, liquid, water, milk, hard, soft, rough, smooth, shiny, freezing, melting, float, sink, magnet, metal, light, shadow.	Material, properties, solids, wood, plastic, stone, glass, metal, liquids, water, milk, oil, strong, weak, soft, hard, rough, smooth, shiny, dull, magnetic.	Material, properties, solids, wood, plastic, stone, glass, metal, liquids, water, milk, oil, change, squash, twist, bend, stretch, elastic, absorb, waterproof, test, strong, weak, soft, hard, rough, smooth, shiny, dull.	Materials, properties, states of matter, solid, liquid, gas, change state, melting, freezing, cooling, heating, boiling, evaporation, condensing, condensation. Water cycle, Temperature, degrees Celsius.	Materials, properties, states of matter, hardness, solubility, soluble, insoluble, dissolve, mix, changes of state, reversible, irreversible, separate, sieving, filter, evaporation, boiling, heating, cooling, transparency, conductivity (electrical and thermal), and magnetic.

Forces and magnets	**EYFS** **Know** magnets are attracted (stick) to some metals and each other. **(Taught in Spring 1)**			**LKS2** **Forces and magnets** **Compare** how things move on different surfaces. **Notice** that some forces need contact between 2 objects, but magnetic forces can act at a distance. **Observe** how magnets attract or repel each other and attract some materials and not others. **Compare and group together** a variety of everyday materials on the basis of whether they are attracted to a magnet. **Identify** some magnetic materials. **Describe** magnets as having 2 poles.	**UKS2** **Forces** **Explain** that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. **Identify** the effects of air resistance, water resistance and friction, that act between moving surfaces. **Recognise** that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. **(Taught in Year A Summer 1)**

				Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. **(Taught in Year A Summer 1)**	
Forces and Magnets	(verbal) magnet, attract, stick, metal, material,			Magnet, poles, south, north, attract, repel, force, distance, materials, magnetic materials, metals	Magnet, gravity, attract, force, fall, friction, surface, resistance, water resistance, air resistance, lever, pulley, gears, work, mechanism,
Rocks and Soils LKS2 Evolution and Inheritance UKS2				**Rocks and soils** (taught with evolution and inheritance in KS2 class). **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.	**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

				Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. **Know** how sedimentary rocks are made. **Know** who Mary Anning was. **(Taught in Year A Spring 2)**	kind, but normally offspring vary and are not identical to their parents. **Identif**y how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Know** who Darwin was and that he wrote the Theory of Evolution. **(Taught in Year A Spring 2)**
Rocks and soils (LKS2) taught with Evolution and Inheritance (UKS2)				Fossils, rocks, sedimentary, metamorphic, igneous, properties, MOH's hardness test, compare, group, test, soils, organic matter, humus, top soil, parent rock,	Fossils, records, reproduce, evolution, change, adapt, adaptation, identical, environment, Darwin, Theory of Evolution
Earth and Space				**Earth and space** (UKS2 topic taught early)	**Earth and space**

				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. **Know** it is not safe to look at the sun. **Know** who Maggie Aderin-Pocock is. **(Taught in Year B Autumn 2)**	**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 . **Name** the 8 planets found in our solar system . **Know** how our knowledge of the solar system has changed over time e.g. Galileo, Aristotle. **(Taught in Year B Autumn 2)**
Earth and Space Vocabulary				Earth, moon, planets, solar system, sun, gas, hydrogen, star, spheres, spherical, day, night, shadow, damage,	Earth, moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, dwarf planet, Milky Way, reflect, change, Full moon, New moon, cycle, Lunar month, theories,

Electricity **(Taught in Year A Spring 1)**				**Electricity** **Identify** common appliances that run on electricity. **Construct** a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. **Identify** whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. **Recognise** that a switch opens and closes a circuit and **associate this** with whether or not a lamp lights in a simple series circuit.	**Electricity** **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. **(Taught in Year A Spring 1)**

				Recognise some common conductors and insulators. **Associate** metals with being good conductors. **(Taught in Year A Spring 1)**	
Electricity Vocabulary				Electricity, electrical equipment, circuit, open, closed, switch, lamp, light, buzzer, sound, battery, wires, conductors, metals, insulators, test.	Electricity, electrical equipment, circuit, open, closed, switch, lamp, light, buzzer, sound, battery, wires, conductors, metals, insulators, test, brightness, loudness, circuit diagram, electrical symbols.
Light	**EYFS** **Know** light can travel through transparent materials. **Know** that if you block light it makes a shadow. **(Taught Spring 1)**			**LKS2** **Light** **Recognise** that they need light in order to see things and that dark is the absence of light. **Notice that** light is reflected from surfaces.	**UKS2** **Light** **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.

				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. **Recognise and use** the terms, transparent, translucent and opaque. **Know** about Thomas Edison the inventor. **(Taught in Year A Autumn 2)**	**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 **Know** that light is measured in lumens. **Know** about Alhazan the 'Father of optics' and how the theory of how light travels has changed over time. **(Taught in Year A Autumn 2)**

Light Vocabulary	(verbal) Light, see-through, transparent, shadow, see, eye.			Light source, sun, Light, dark, shadow, block, reflect, Transparent, translucent, opaque, protect, eye, damage, lumens.	Light source, sun, Light, dark, shadow, reflect, Transparent, translucent, opaque, protect, damage, lumens, straight lines, block, eye, lens, focus.
Sound (LKS2) Taught alongside **Working Scientifically (UKS2)**	**Natural Processes** **Know** that sound causes vibrations. **(Taught in Summer 1)**			**Sound** (taught in KS2 class with working scientifically UKS2). **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	**Working Scientifically (Non Statutory)** Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Explain which variables need to be controlled and why. Decide how to record data from a choice of familiar approaches. **(Taught in Year B Autumn 1)**

				Recognise that sounds get fainter as the distance from the sound source increases. **Know** loud sounds can permanently damage hearing. **(Taught in Year B Autumn 1)**	
Vocabulary	Sound, hear, vibration			Sound, sound source, vibration, medium, volume, pitch, travel, ear, vacuum, decibels, safety.	Science enquiry, comparative and fair testing, classify, observation over time, pattern seeking, research, variables, independent, dependent, control, enquiry, prediction, method, diagram, results, conclusion.

IN KEY STAGE ONE, ALL ASPECTS OF THE CURRICULUM WILL BE COVERED IN EACH YEAR GROUP

IN KEY STAGE TWO, ALL ASPECTS OF THE LOWER KEY STAGE AND UPPER KEY STAGE WILL BE COVERED IN A 2 YEAR CYCLE AND TOPICS ARE MATCHED, AS CLOSELY AS POSSIBLE, SO THAT THEY CAN BE TAUGHT IN ONE CLASS. THIS WILL AID WITH PROGRESSION AND ALLOW REVISITING OF PRIOR LEARNING.

Osmotherley Primary School: Science - EYFS and Y1 and Y2 Programme Overview.

Osmotherley Science Long Term Plan EYFS and KS1 – Curriculum 2021

	Autumn		Spring		Summer	
EYFS	**Hygiene** – Teeth and body **Body parts** - name animals / humans body parts **Healthy Eating**	**Natural Processes** - floating and sinking **Natural Processes** - changes of state – melting and freezing	**Natural Processes** - light travelling through materials and shadows **Natural Processes** - magnets	**Observe changes in animals** – tadpoles / caterpillars	**Compare environments** e.g. woodland/ meadow/ school yard **Natural processes** - sound causing vibration	**Plants** - Observe changes in plants

KS1 – Year 1	**Animals including humans**	Fish/ birds/ mammals Human body parts, senses.	**Everyday materials and their uses**	**Animals including humans** Amphibians / insects	**Plants**	**Animals including humans** Reptiles Carnivores, herbivores and omnivores
KS1 – Year 2	**Animals including humans**	Basic needs, food and hygiene.	**Everyday Materials and their uses**	**Animals including humans** Lifecycles – human, amphibian, butterfly	**Plants**	**Living things and their habitats** Habitats and foodchains

Osmotherley Primary School: Science – LKS2 and UKS2 Two Year Rolling Programme Overview.

	Autumn	Spring	Summer

KS2 – Year 3/4 **Cycle A**	**Animals including humans** (skeleton and teeth)	**Light** **Thomas Edison**	**Electricity**	**Rocks** **Mary Anning**	**Forces and Magnets**	**Living things and their habitats** (Grouping and using keys)
KS2 – Year 3/4 **Cycle B**	**Sound**	**Earth and Space** (Sun and moon, day/night) **Dr Maggie Aderin-Pocock**	**Materials – states of matter** (Cooling/heating and evaporation)	**Animals including humans** (Nutrition and food chains)	**Plants** Parts – function/ growth/ transportation of water/	**Living things and their habitats** (Environment) **Greta Thunburg**
KS2 – Year 5/6 **Cycle A**	**Animals including humans** (Diet and life style)	**Light** **Alhazan**	**Electricity**	**Evolution & Inheritance & adaptation** **Darwin**	**Forces and magnets** **Issac Newton**	**Living things and their habitats** (classification) **Carl Linnaeus**

KS2 – Year 5/6 Cycle B	Scientific Enquiries	Earth and Space (planets, phases of the moon) Aristotle/Galileo /Copernicus	Materials (dissolving, mixing, separating, changing state)	Animals including humans (Circulatory, urinary and digestive systems)	Plants Reproduction/ seed development/ seed dispersal	Living things and their habitats (micro-organisms) Alexander Flemming

Small Steps Teaching Programmes for Science at Osmotherley School

EYFS and Years 1 and 2.

Seasons are always taught at the beginning of the term or half term in science and/or Forest Schools then other topics follow on.

Natural Processes (Physics) Animals and Humans (Biology) Environmental Science

	Autumn		Spring		Summer	
EYFS **Small Steps**	**Seasons** 1. Observe environment – weather, plants, animals.	**Natural Processes - floating and sinking** 1. Recognise when an object floats and use the word floats.	**Seasons** 1. Observe environment – weather, plants, animals.	**Seasons** 1. Observe environment – weather, plants, animals.	**Compare environments** e.g. woodland/ meadow/ school yard	**Seasons** 1. Observe environment – weather, plants, animals.

	2. Talk about what they observe. 3. Draw what they observe. 4.. Name the season (Autumn) **Hygiene – Teeth and body** 1. Know how to keep their hands clean. 2. Know when to clean their hands e.g. after toileting, before lunch, after being outside playing. 3. Know how to clean their teeth. **Healthy Eating** Name a healthy food. Choose a healthy food from a small selection.	2. Recognise when an object sinks and use the word sinks. 3. Sort objects into those that float and sink. **Natural Processes - changes of state – melting and freezing** 1. Show children liquids and solids. 2. Recognise when a liquid freezes and use the word change, freezes and solid. 2. Recognise when a solid melts and use the word change, melts and liquid. **Animals and their body parts** 1. Name their main body parts. 2. Name and recognise animal body parts.	2. Talk about what they observe. 3. Draw what they observe. 4.. Name the season (Winter) **Natural Processes - light travelling through materials and shadows** 1. Look through different materials. Can they see through it? (Transparent) 2. Sort materials into see-through (transparent) and not see-through. 3. Shine a light through transparent materials. What happens? Light travels through it. 4. Shine a light at a non-see-through material. What happens? It makes a shadow.	2. Talk about what they observe. 3. Draw what they observe. 4.. Name the season (Spring) **Observe changes in animals** – tadpoles / caterpillars 1. Use a magnifying glass to observe frogspawn or caterpillar eggs. 2. Draw their observations and colour and name parts. 3. Continue observations and diary each week. 4. Watch a video/share a book about lifecycle of a frog / caterpillar.	1. Name parts of school outside environment. 2. Name plants and animals they find in school outside environment. 3. Visit woodland site (Applegarth – Forest Schools) and name parts of that environment – wood/trees/grass/stream. 4. Name some of the plants and animals they find in the woodland site. **Natural processes - sound causing vibration** 1. Give children percussion instruments to make a sound. 2. Are all the sounds the same? (No)	2. Talk about what they observe. 3. Draw what they observe. 4.. Name the season (Summer) **Plants - Observe changes in plants** 1. Dig up a plant and dissect it into its parts – flower, stem, leaves, roots. 2. Make an observational drawing of a plant and label its parts. 3. Plant some seeds and observe changes over time naming the parts as it grows – roots, shoot, stem, leaves, flower.

			Natural Processes – magnets 1. Name the force push or pull. 2. Make magnets and magnetic toys push and pull each other. 3. Teacher demonstrate how magnets are attracted to some metals. 4. Go on a treasure hunt for metals attracted to magnets.		3. How are all the sounds made? (Hitting) 4. Observe what happens when the instrument is hit. (Look for vibrations) 5. Put rice on drum surface to better see the vibrations or make triangle touch water. 6. Make a comb and paper instrument or use balloon to use their voices to make sounds and vibrations.	
Key Facts in EYFS	Use the name autumn. Say how we keep clean in school and at home e.g. handwashing, brushing teeth. Name some healthy foods.	Recognise floating. Recognise sinking. That changing ice into water is called **melting.** That changing water into ice is called **freezing.**	Use the name winter Know light can travel through transparent materials Know that if you block light it makes a shadow.	Use the name spring Know a tadpole changes into a frog. Know a caterpillar changes into a butterfly.	Use the name summer. Know that sound can make objects vibrate.	Name and identify parts of a plant – flower, root, leaves, stem

		Names of some materials which are solids or liquids e.g. wood and water Names of parts of their body and names of animal body parts e.g. head, leg, tail.	Know magnets are attracted to some metals and each other			
KS1 – Year 1 **Small Steps**	**Seasonal changes (Autumn)** 1. Review names of the 4 seasons 2. Name the signs of this season. 3. Observe and look for the signs of this season. 4. What we wear in this season		**Seasonal changes (Winter)** 1. Review names of the 4 seasons 2. Name the signs of this season. 3. Observe and look for the signs of this season. 4. What we wear in this season	**Seasonal changes (Spring)** 1. Review names of the 4 seasons 2. Name the signs of this season. 3. Observe and look for the signs of this season. 4. What we wear in this season	**Seasonal changes ()** 1. Review names of the 4 seasons 2. Name the signs of this season. 3. Observe and look for the signs of this season. 4. What we wear in this season	

		Animals and Humans 1. What do all fish have in common? Label or list. 2. What do all birds have in common? Label or list. 3. What do all mammals have in common? Label or list. 4. Sort animals into fish, birds, mammals. 5. Name and label human body parts. 6. Name body parts which are to do with senses.	**Everyday materials and their uses** 1. What is a material? (Deal with fabric misconception) 2. Identify and name these materials – wood/glass/paper/ metal/fabric/plastic 3. What is a property of a material? 4.Treasure hunt for materials with a given property. 5. Given a material name 2 of its properties.	**Animals and Humans** 1. What do all amphibians have in common? 2. Observe, draw and measure changes over time of tadpoles. (amphibians) 3. Observe, draw and measure changes over time of caterpillars. (invertebrates)	**Plants** 1. Identify and name the parts of a plant. 2. Identify and name the parts of a tree. 3. Identify deciduous and evergreen trees from their leaves and seeds/cones. (Flowering and non-flowering) 4. Name and draw deciduous leaves/seeds and evergreen leaves/cones	**Animals and Humans** 1. What do all reptiles have in common? 2. Sort animals into fish, birds, mammals, reptiles, amphibians 3. What animals eat? 4. Know what carnivores eat and identify carnivores. 5. Know what herbivores eat and identify herbivores.

		7. Match body part to sense.				6. Know what omnivores eat and identify omnivores. 7. Sort animals into herbivores, carnivores and omnivores.
Key Facts in Year 1	Seasonal changes Name the season. Name one thing which shows it is autumn. Name 4 baby animals and their adult parents.	Animals, including humans Identify and name a fish, a bird, a mammal from a picture. Name a feature of a fish. Name a feature of a bird. Name a feature of a mammal. Label the basic parts of the human body on a picture. Name the 5 senses.	Seasonal changes Name the season. Name one thing which shows it is winter.. Everyday materials Name 6 different types of materials, (wood, plastic, glass, metal, water, and rock). Name at least 2 simple physical properties of a variety of everyday materials	Animals, including humans Identify and name an amphibian from a picture. Name a feature of an amphibian .	Label the parts of a plant. Label the parts of a tree. Identify and name a variety of common wild and garden plants from pictures or in-situ. (daisy, nettle, grass, dandelion, daffodil, rose,) Identify and name deciduous and evergreen trees from pictures or in-situ (oak, horse chestnut, fir, holly)	Animals, including humans Identify and name a reptile from a picture. Name a feature of a reptile. . Name a carnivore. What does a carnivore eat? Name a herbivore. What does a herbivore eat? Name an omnivore.

			Name 2 materials which are both shiny. Name two materials which are both hard.			What does an omnivore eat?
KS1 – Year 2 **Small Steps**	**Seasonal changes (Autumn)** 1. Name the 4 seasons in order 2. Observe how day length changes during this season. 3. Observe weather changes during this season.		**Seasonal changes (Winter)** 1. Name the 4 seasons in order 2. Observe how day length changes during this season. 3. Observe weather changes during this season.	**Seasonal changes (Spring)** 1. Name the 4 seasons in order 2. Observe how day length changes during this season. 3. Observe weather changes during this season.	**Seasonal changes (Summer)** 1. Name the 4 seasons in order 2. Observe how day length changes during this season. 3. Observe weather changes during this season.	
		Animals including humans 1. Learn the 4 basic things animals all need to live	**Everyday materials and their uses** 1. Sort into liquids and solids.	**Animals and Humans**	**Plants** 1. What do flowers do?	**Living things and their habitats** 1. Review 4 basic things all animals

		2. Learn about food groups - proteins, carbohydrates, fruit and vegetables, dairy 3. Learn how the body uses the food group. 4. Sort food into groups and say how body uses the food. 5. Hygiene – keeping the body clean. 6. Hygiene – looking after your teeth	2. Difference between solids and liquids. (Properties) 3. Sort materials into natural and man-made. 4. Test materials for these properties – twist/stretch/squash/ bend. 5. Test materials for being waterproof. 6. Test material for absorbency. 7. Why is given material used for this purpose e.g. wood for chair?	1.Order and name of stages of the human lifecycle 2. Match animal babies and their adults. 2. Observe, draw, record and measure changes over time of tadpoles. (amphibians) 3. Observe, draw, record and measure changes over time of caterpillars. (invertebrates) 4. Order and name stages of lifecycle of frog and /or butterfly.	2. Collect seeds from flowering plants. 3. What do seeds do? 4. What do seeds need to germinate? (Science enquiry) 5. What do plants need to grow healthy? (Science enquiry)	need to live. (Food, water, shelter, air) 2. What is a habitat? (An area where animals have food, shelter, water and air). 2. Identify animals including invertebrates in woodland habitat (Forest Schools) 3. Identify plants in woodland habitat (Forest Schools) 4. What is a food chain? 5. Make some food chains.

Key Facts in Year 2	Describe 2 changes they see which shows it is autumn. What is the weather like in autumn. What is happening to the day length in autumn?	From a list circle the 4 basic things all animals need to live. Sort foods into these food groups – carbohydrates, proteins, fruit and vegetables, dairy. Name 2 ways to keep your body clean. How can you look after your teeth? How can you keep yourself fit?	Describe 2 changes they see which shows it is winter. What is the weather like in winter. What is happening to the day length in winter? Say why a material is suitable for its particular use. Name some ways a solid material can be changed.	Describe 2 changes they see which shows it is spring. What is the weather like in spring. What is happening to the day length in spring?	Describe 2 changes they see which shows it is summer. What is the weather like in summer. What is happening to the day length in summer? Know the order of the seasons. Name 2 things a seeds needs to germinate and grow.	Recognise things that are living, dead, and things that have never been alive. Name at least 2 habitats. and at least 2 animals or plants which they would find there. Given 3 pictures (plant and 2 animals) put them in a food chain.

KS2 Two Year Rolling Programme for Science

Natural Processes (Physics) Animals and Humans (Biology) Environmental Science States of Matter (Chemistry)

	Autumn	Spring	Summer

KS2 – Year 3/4 Cycle A Small Steps	**Animals including humans** (skeleton and teeth) 1. What are teeth used for? 2. Identify and name different types of teeth in humans using mirrors/prints/ pictures/diagrams. 2. Function of different types of teeth. 3. Function of different type of teeth in animals – link to herbivores/ carnivores/ omnivores. 4. What is bad for your teeth? (Science Enquiry – Egg test) 5. Skeleton match (Vertebrates)	**Light** 1. What is a light source? 2. Make a list of light sources 3. Investigate if we can see in the dark. 4. Investigate if we can see reflective items in the dark. 5. Which items are good or poor reflectors of light? (Light box test Science Enquiry) 6. Properties of materials – transparent, translucent and opaque. Materials sort. 7. Make shadows and shadow puppets. Which material makes the best shadows? 8. Sun and light safety 9. Find out about Thomas Edison.	**Electricity** 1. Electrical safety Items which work using electricity 2. Name and identify different parts of an electrical circuit 3. Make a working electrical circuit. 4.Predict if electrical circuits will work and say why. 5.Test which materials will conduct electricity. 6.Sort materials into electrical insulators and electrical conductors	**Rocks** 1. How are rocks made? (Chocolate rocks) 2. How are fossils made? 3. Order how fossils are made. 4. Who was Mary Anning? 5. Testing rocks – Moh's Hardness Test (Science Enquiry – sorting and grouping) 6. What is in soil? (Science Enquiry – sorting and grouping) 7. What is humus?	**Forces and Magnets** 1. Name different forces. 2. How to draw force diagrams. 3. Magnets – forces which act at a distance. 4. Recognising poles. 5. Recognising repel and attract forces. 6. Write rules for magnets. 7. Which materials are attracted to magnets? (Science Enquiry – Sorting and grouping) 8. Which magnet is the strongest? (Science Enquiry – Comparison and Fair Test)	**Living things and their habitats** (Grouping and using classification keys) 1. Sort and group plant and animal pictures. (Observable features) 2. How to ask closed questions to sort and group living things using their observable characteristics. 3. Make own classification key (branching diagram). 4. Use plant classification keys in field. 5. Make own classification key for flowering/non-flowering plants.

	6. Make human skeletons (straws) label bones. 7. Function of a skeleton. 8. How muscles work.				9. Friction – a force which acts between two touching surfaces. 10. Which surface has the most friction? (Science Enquiry – Comparison and Fair Testing)	6. What is an invertebrate? (Review) 7. Identify and label features of insects. 8. Identify insects from other invertebrates.
Key Facts for **Year3/4** **Cycle A**	**Animals including humans** (Skeleton and teeth) Name 2 types of teeth and say what they are used for. Describe 2 ways you can look after your teeth. Label the bones in this skeleton (skull, ribs, spine, pelvis, femur)	**Light** What is a light source? Example. Why can't we see in the dark? Draw or write how you can make a shadow. What does opaque mean? What does translucent mean? What does transparent mean?	**Electricity** Name at least 2 items which run on electricity Name the parts of this electrical circuit (picture) What is the function of battery? What is the function of the wire? What is the function of the bulb?	**Rocks** How are fossils made? What is soil made of? Who was Mary Anning?	**Forces and Magnets** What are the names of the poles of the magnet? Which of these pairs of magnets will have an attract force? Which of these pairs of magnets will have a repel force? Which of these materials are attracted to a magnet?	**Living things and their habitats** (Grouping and using classification keys) What is an invertebrate? What is a vertebrate? What are the 5 animal classes? What is a classification key?

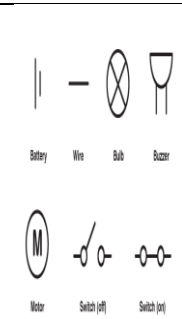
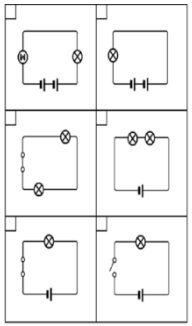
	Circle a ball and socket joint on the skeleton in red. Circle a hinge joint on the skeleton, in blue. Give 2 reasons we have a skeleton. Why do we have muscles?	Why are sunglasses good to wear on sunny days?	What is the function of the switch? Name 2 electrical insulators Name 2 electrical conductors		What is the name of the force which stops us sliding about on a floor?	Name the 2 types of plant and give an example. How do you know if something is an insect?
KS2 – Year 3/4 **Cycle B** **Small Steps**	**Sound** 1. What is a sound source? 2. Identify sound sources. 3. How does it get to you? (travelling medium) 4. How do we hear sound? The ear. 5. How do we measure sound? Decibels and sound apps.	**Earth and Space** (Sun and moon, day/night) 1. What is the sun? 2. What are planets? 3. How do planets move? Orbits and rotation. 4. Ordering the planets in our solar system. (Use mnemonic) 5. Why does the sun appear to move across the sky? 6. Why do we have day and night?	**Materials – states of matter** (Cooling/heating and evaporation) 1. Solids, liquids and gases – sort and name. 2. Particles and what they look like in a solid, liquid or gas. 3. Properties of a solid, a liquid, a gas. 4. Changing state.	**Animals including humans** (Nutrition and food chains) 1. The digestive system. 2. The mouth (teeth review) 3. The digestive organs and what they do. 4. Order, name and say function of digestive organs.	**Plants** (Parts – function/ growth/ transportation of water) 1. Name parts of a flowering plant (Review) 2. Function of each part of flowering plant. 3. How water is transported up the plant to the leaves and flower.	**Living things and their habitats** (Environment) 1. What is a habitat? (Review) 2. Name some habitats and environments. 3. How habitats and environments change over time e.g. river courses or wilding areas. 3. What effects do humans have on

	6. Dangers of sound – decibel chart. 7. Sound and vibrations (Science Enquiry – pattern seeking) 8. Sound and distance (Science Enquiry – fair test) 9. Sound needs a medium (String telephones) 10. Changing the pitch of a stringed instrument (Science enquiry – pattern seeking)	7. Who is Dr Maggie Aderin-Pocock and what does she do?	5. Solid to liquid and vice versa. (Ice – Freezing and melting points) 6. Solid to liquid (Science Enquiry – Melting point of butter?) 7. Liquid to gas – evaporation (Science Enquiry – best place for evaporation) 8. Gas to liquid – condensation. 9. The water cycle. 10. Make water cycle in a plastic bag.	5. Food groups (review) 6. How does the body use - Proteins, carbohydrates, vitamins and minerals, fats and oils? 7. Food group sort. 8. What is a balanced diet? (Food plate) 9. Food chains (review) 10. Producers, prey and preditors. 11. Make own food chain and label.	4. Celery and flower dye test (Science Enquiry – Observation over time) 5. What do plants need to grow well? (Science Enquiry – Comparison and Fair Test) - leaves - water - air - light - room	environments and habitats? 4. Study of one environment and the effect changes are having on the habitat and its animals. 5. Who is Greta Thunberg?
Key Facts **Y3/4** **Cycle B**	**Sound** How is sound made? Name a sound source.	**Earth and Space** (Sun and moon, daylight) What is the sun?	**Materials – States of Matter** Name the 3 states of matter.	**Animals including humans ((**Nutrition and food chains) What is the digestive system?	**Plants** **(**Parts – function/ growth/ transportation of water)	**Living Things and their Habitats** (Environment) What is a habitat?

	The bigger the vibration the _____ the sound. The shorter the string the _____ the sound. What happens if you walk further away from a sound e.g. a car alarm? Which of these will not let sound pass through: air, water, wood, space (vacuum), string?	What shape are stars and planets? What is the name of the planet we live on? Why do we have day and night? Why must we not look at the sun? Can sound travel in space? Who is Dr Maggie Aderin-Pocock?	Draw what the particles look like in each state of matter. Name a property of - a solid - a liquid - a gas What do we call it when a solid changes into a liquid? What do we call it when water changes into ice and what temperature does it do this? What do we call it when a liquid changes into a gas? How can we make water evaporate faster?	Label the main parts of the digestive system. (Mouth, stomach, anus) Why do we need to eat? Name the different food types (carbs, proteins, fats and oils, vitamins and minerals) What is a balanced diet? Make a food chain and label the predator, producer and the prey.	What is the function of the parts of the plant: flower, stem, leaves, roots. Draw arrows to show how water is transported in this plant. What will happen if you stop giving a plant water? What is germination? What one thing does a seed need to germinate? What 2 things does your growing plant need now?	Name an animal that lives in a polar environment. Name an animal that lives in a tropical environment. Name one way a habitat or environment can be damaged. Who is Greta Thunberg?

KS2 – Year 5/6 **Cycle A** **Small Steps**	**Animals including humans** (Diet and lifestyle) 1. Order human lifecycle and research stages 2. Food groups and how our body uses them. 3. What is a healthy diet? 4. What is an unhealthy diet? - Sugar amounts in food study. 5. What is a balanced diet? 6. Keeping our bodies healthy through exercise. 7. What effect do different physical activities have on the heart? (Science Enquiry)	**Light** 1. Know different between artificial and natural light sources 2. Prove light travels in straight lines – The torch/cards/hole test 3. Investigating shadows (Why are shadows the same shape as the object?) 4. Transparent, translucent and opaque materials making shadows 5. Investigating shadows (How can shadows be changed i.e. made bigger or smaller – Science Enquiry – pattern seeking). 6. Reflecting light using mirrors (signalling). 7. Drawing light rays and showing direction of light beams. 8. How we see – our organ – the eye.	**Electricity** 1. Safety when using electrical equipment in circuits 2. Make and test electrical circuits from circuit diagrams. 3. How can we make a buzzer louder or a bulb brighter? 4. Write a testable question for a science enquiry and draw the circuit diagram. (Science enquiry.) 5. Which materials conduct electricity?	**Evolution & Inheritance & adaptation** 1. Fossil collections and records (paleontology) 2. Order the evolution timeline. 3. Inheritance – observable family traits in the British Royal family 4. Simple genetics – how features are passed on. 5. Who is Charles Darwin? 6. Adaptation and evolution. 7. Research adaptation and evolution of an animal.	**Forces** 1. Review how to draw force diagrams. 2. Gravity – forces which act at a distance without touching. 3. What is gravity, where does it work? 4. Draw force diagram showing earth and gravity. 5. Who was Sir Isaac Newton? (Research) 6. What is air resistance? 7. Parachute science enquiry. 8. Draw force diagram showing air resistance and gravity.	**Living things and their habitats** (Classification) 1. Classification of living things overview. 2. Who was Carl Linnaeus (research)? 3. Use plant or animal classification key in field. 4. Compare lifecycles and stages of bird and mammal. 5. Compare lifecycles and stages of frog and butterfly. 6. Lifecycle of human – adolescent stage and reproduction.

	8. Effects of drugs and medicines on the human body. 9. Keeping ourselves healthy mentally (exercise, sleep, relaxation).				9. What is water resistance? 10. Water resistance science enquiry. 11. Draw force diagram showing water resistance and gravity. 12. Friction science enquiry. 13. Draw force diagram showing friction and gravity forces.	
Key Facts **Y5/6** **Cycle B**	**Animals including humans** (Diet and lifestyle) Name the stages of the human lifecycle (Foetus, baby, child, teenager (adolescent), adult, elderly) What does the body use protein for?	**Light** How does light travel? Why are shadows the same shape as the objects that make them? What do we call a material which is completely see-through?	**Electricity** What do these symbols mean?	**Evolution & Inheritance & adaptation** What do fossils tell us? Why are offspring (e.g. children) not identical to their parents? Name an animal that is adapted to its	**Forces** What is the name of the force that makes an object fall to the ground? Label the forces in these diagrams. (See attached) Who was Sir Isaac Newton?	**Living things and their habitats (Classification)** (Previous) Name the stages of the human lifecycle? What is a lifecycle? Who was Carl Linnaeus?

	How does the body use carbohydrates? How does the body use vitamins and minerals? What effect does too little/too much exercise have on the human body? What effect does too little/too much food have on the human body? What effect does too much medicine/drugs have on the human body? What effect does too little sleep have on the human body? What would you do if you felt very sad?	What do we call a material which cannot be seen through? What do we call a material which can be partly see-through but is hazy or coloured? Which organ do we see with? What is reflection?	 **Which of these circuits will work?** 	environment and say how it is. What is evolution? Who was Charles Darwin?		How do non-flowering plants reproduce? Name something which happens in both the lifecycle of an insect and amphibian. Name 2 changes which happen to your body during human adolescence?
KS2 – Year 5/6	**Working Scientifically** (How to write up science	**Earth and Space** (planets, phases of the moon)	**Materials** (dissolving, mixing,	**Animals including humans** (Circulatory, urinary	**Plants** (Reproduction/ seed	**Living things and their habitats** (micro-organisms)

Cycle B **Small Steps**	investigations and plan fair tests) 1. The 5 types of science enquiry. 2. Matching type of science enquiry to previous tests performed in science lesson. 3. What is a variable in a fair test? 4. Independent variable. 5. Dependent variable. 6. Control variable. 7. Identifying variables practise. 8. How to write up a science enquiry. 9. The question. 10. The prediction	1. The main bodies found in our Solar System. 2. Scale of planets and distance from the sun – ordering (nrich) 3. What is the moon? How does it move? 4. Phases of the moon. 5. How have our ideas about Earth and space changed over time? Aristotle/Galileo/Copernicus.	separating, changing state) 1. Solids, liquids and gases. (Review of particles) 2. What is melting? (Particle) 3. What is freezing (solidifying)? (Particles) 4. Reversible changes – ice to water and water to ice. 5. Irreversible changes – raw egg to fried egg. 6.Reversible or irreversible change testing. 7. Mixtures (particles) 8. How to separate mixtures.	and digestive systems) 1. What is a nutrient? (Water, food, air) 2. Transport of nutrients by the body. 3. The digestive system – label the organs (review). 4. Roles of the digestive organs – breakdown and absorption. 5. The circulatory system – transporting nutrients in the blood around the body. 6. The circulatory organs – name and label and function. 7. The lungs and oxygenated and	development/ seed dispersal) 1. Flowering and non-flowering plants (review). 2. Flowers – purpose – reproduction. 3. Flower parts – name. 4. Flower parts – sex. 5. Pollination. 6. Seed formation. 7. Types of seed dispersal.	1. Classification of living things. (Review) 2. What are micro-organisms? 3. Fungi – what are they? 4. Bacteria – What are they? 5. Types and uses. 6. Who was Alexander Flemming? 6. Dirty Hands Science Enquiry. (Observation over time) 7. Rotting Food (Science Enquiry) 8. Viruses – what are they? 9. Importance of hygiene.

	11. The scientific diagram – labels 12. The method – numbered, 13. Data and results – how to make a table 14. Writing a conclusion.		9. Separating mixtures of solids. (Test) 10. What is dissolving? (Particles) 11. Separating mixtures using dissolving and filtering. (Test)	deoxygenated blood. 8. The urinary system – water transport		
Key Facts **Y5/6** **Cycle B**	**Working Scientifically** (How to write up science investigations and plan fair tests) What is a variable? Which variable do you change? Which variable do you measure? Name a type of scientific enquiry.	**Earth and Space** (Sun and moon, daylight) How do the planets move in relation to the sun? Why does the moon appear to change shape over a month? How many planets are there in our solar system? What are their names in order?	**Materials** (dissolving, mixing, separating, changing state) How do you know if a solid has dissolved in a liquid? Draw what the particles look like. How could you recover the salt from a solution of salt and water?	**Animals including humans** (Circulatory, urinary and digestive systems) Label the digestive system (Mouth, oesophagus, stomach, liver, small intestines, large intestines, rectum, anus) Say what these parts of the digestive system do:	**Plants** (Reproduction/ seed development/ seed dispersal) Why do flowering plants make flowers? What is pollination? Name one method of pollination. Name two methods of seed dispersal.	**Living things and their habitats** (micro-organisms) What are micro-organism? Name the 3 types of micro-organisms. Name a useful micro-organism. Name a problem micro-organism. How can you reduce or protect yourself

		Why was Galileo put in prison?	How would you separate a mixture of sand and salt? Give an example of a reversible change and describe what happens. Give an example of an irreversible change and say what happens.	stomach, small intestine, large intestine) What is the main function of the urinary system? Label these parts of the urinary system. (kidney, bladder) What is the main function of the circulatory system? Label these parts of the circulatory system: heart, lungs, veins, arteries. Which blood vessels carry oxygenated blood? Why does your heart beat faster when you exercise?		from problem micro-organisms?