The Ribblesdale Federation of Schools

Science Curriculum Handbook

Year A

Year Groups	Year A						Year B					
	1	2	3	4	5	6	1	2	3	4	5	6
Year 1	Animals including humans- All about me	Animals including humans - All about animals	Exploring everyday Materials Unit 1	Exploring everyday materials – unit 2	Plants	Seasonal Changes	Animals including humans- All about me	Animals including humans - All about animals	Exploring everyday Materials Unit 1	Exploring everyday materials – unit 2	Plants	Seasonal Changes
Year 2 Year 3	Animals including humans – yr 3	Electricity – Yr4	Forces and Magnetism	Living things and habitats Yr 2/4	Rocks – year 3	Plants – yr2	Everyday materials Y2	Light Y3	State of matter – yr 4	Living things and their habitats – yr 2/4	Animals including humans Y2	Plants Y3
Year 4/5/6	Earth and Space	Light Y6	Animals Including humans – yr6	Sound Yr4	Forces	Electric – yr6	Living things- 5	Animals including Humans - Yr4	Changes of materials	Evolution inheritance	Living things - yr6	Animals including humans - 5

Science

Intent

Science is vital to our future prosperity and it is important that our children are engaged with all aspects of science. All pupils across the Ribblesdale Federation of School will be provided with the foundations to understand the specific disciplines of biology, chemistry and physics and to develop an understanding of the world around them at an age-appropriate level.

We develop the natural excitement and curiosity of all children, including those with SEND, and inspire them to pursue scientific enquiry now and in further life. Throughout the primary years, children should learn to work scientifically by investigating, explaining and analysing phenomena, making predictions, questioning the world around them and solving problems.

Teachers nurture a love for the natural world, excitement for future possibilities in science and provide many opportunities for pupils to grow their own growth mindset and rational thinking.

Pupils with SEND

To support pupils with SEND to access a full science curriculum, we use a range of approaches which include, but are not limited to: pre-teaching scientific vocabulary; use of visual aids; scaffolding resources, such as experiment templates and writing frames; additional thinking time; additional adult support; use of technology; multi-sensory activities; alternative means to record responses; science concept cartoons; task breakdown plans; use of vocabulary mats, and; targeted questioning.

Implementation

The Curriculum –

- The National Curriculum statutory requirements are taught and assessed in each year as a basic minimum.
- Teachers are familiar with previous and subsequent year groups' content in order to link learning and build on previous knowledge.
- When planning, teachers refer to the progression document for their current topic and to the Developing Experts resources to ensure teaching is progressive throughout school.

Timetabling –

- Science is taught discretely once per week by the class teacher.
- When there is a natural link between a science topic and other curriculum areas, teachers should endeavour to work in a cross-curricular manner e.g. to link the teaching of evolution with the history topic of Stone Age.
- Science content being covered through a cross-curricular approach must include a learning objective taken from the year group's science curriculum and recorded in the science exercise book.

Teaching –

- Teachers follow children's interests and lines of inquiry.

- Each lesson includes a working scientifically element to ensure working scientifically skills are covered over a two- year period.
- Working scientifically skills are progressive.
- Time should be taken to identify and teach the specialist vocabulary associated with each topic.
- Teaching is differentiated either by resource, support or ability grouping
- Use of open ended enquires to allow all children to access learning at their level.
- More able learners are challenged to make connections within science and to apply their knowledge to real world situations
- Teachers help to develop open mindedness in relation to scientific theories.
- Teachers aim to close the gap for PP children
- Teachers support SEN children in line with support plans. This could include;
    - Pre-teaching
    - Use of Vocabulary lists
    - Scaffolding for scientific experiments
    - Providing additional equipment to meet individuals' needs
    - Alternative methods of recording work, including the use of ICT

- Outside visitors and trips should be utilised as much as possible.
- Challenging stereotypes where possible – encouraging girls into STEM careers
- Resources made readily available to staff to carry out all lessons.
- Science topics will encompass an element of both maths and English.
- Science should refer to SMSC concerns in the modern age e.g. climate change, genetic modifications.

Assessment –

- Children rate vocabulary knowledge at the beginning and end of a topic.
- Children given the opportunity to demonstrate prior knowledge and then add to this over time and new learning occurs.
- Knowledge quiz allows the teacher to clearly see and address any misconceptions.

Impact

- Impact measured through: low-stakes quizzes; vocabulary learning; responses to open ended questions and mini assessments carried out once the topic has been completed
- Children acquire appropriate age-related knowledge.
- Children are equipped with investigative and experimenting skills.

- Children develop on learning skills - concentration, imagination, self-improvement.
- Children develop curiosity and excitement for the word around them.
- Children have a rich vocabulary to help them in science and also to access the wider curriculum.
- Children have high aspirations.
- Children are inspired to continue science learning or pursue a STEM career.
- Children develop their questioning skills.
- Children develop a strong growth mind-set.
- Children can make connections throughout the years e.g. fossils in y3 linked to evolution in y6.
- Children can confidently report and explain outcomes, both written and orally.
- Children can record findings using a range of graphs and tables.
- Children can describe methodology and accurately to allow for retesting.
- Children are prepared for science in further education and able to understand the world around them.
- Children are able to work collaboratively with peers.
- Children are aware of the SMSC concerns surrounding science in the modern age.

Animals including humans – All about me

In Year 1 we...

N.C - **Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense**

1. Discover the basic parts of the human body
Identify the basic parts of the human body
Identify the different parts of the human body
Identify the different parts of the human body and explain what they are used for

2. Learn about your eyes and sight
Understand that our eyes allow us to see
Know the basic parts of the eye
Know the basic parts of the eye and their functions

3. Learn about your ears and hearing
Understand that our ears allow us to hear
Know that our ears help us tell the direction sound is coming from
Understand that sound is made up of vibrations

4. Explore the tongue and taste
Understand that our tongue allows us to taste
Describe a range of different flavours
Understand why our sense of taste is important

5.Explore your sense of touch
Understand that our skin helps us to feel
Know that our fingertips are sensitive to touch
Understand that our sense of touch can identify different textures

6. Discover how your nose smells
Know that our nose allows us to smell
Understand that we can smell many different flavours
Know that our sense of smell helps to keep us safe

Working Scientifically

- Identifying and classifying
- Performing simple tests
- Gathering and recording data to help in answering questions
- Using their observations and ideas to suggest answers to questions

Enquiry Approach

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts.
- Research - Using information from a variety of sources to answer scientific questions.

Enquiry Skill

- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
  Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

Key Vocabulary-

Head, body, brain, pupil, ear, sound, tongue, taste,

Seasonal Changes

In Year 1 we...

N.C - Observe changes across the 4 seasons.

N.C - Observe and describe weather associated with the seasons and how day length varies

1.Understand there are 4 seasons

Name the 4 seasons

Understand what changes the seasons bring

2.Understand the changes that take place in autumn

Understand that autumn is a season

Understand the different weather that happens in autumn

Understand that the days get shorter in autumn

3. Understand the changes that take place in winter

Understand that winter is a season

Understand the different weather that happens in winter

Understand that the days are short in winter

4. **Understand the changes that take place in spring**

Understand that spring is a season

Understand the different weather that happens in spring

Make comparisons between winter and spring

5. Understand the changes that take place in summer

Understand that summer is a season

Understand the different weather that happens in summer

Make comparisons between winter and summer

6. Investigate how you can measure rainfall

Make comparisons about the amount of rainfall over 5 weeks

Draw a graph to show the amount of rainfall over 5 weeks

Draw a graph and write a conclusion explaining my results

Working Scientifically -

- Using their observations and ideas to suggest answers to questions
- Identifying and classifying
- Performing simple tests

Enquiry Approach –

- Observation over time - Observing changes that occur over a long or short period of time.
- Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts.
- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.

Enquiry Skill –

- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts.

Key Vocabulary –

Season, spring, summer, autumn, winter, hibernate, temperature, weather

Plants

In Year 1 we...

N.C - Become familiar with common names of flowers and plant structures, including seeds
N.C - Identify and describe the basic structure of a variety of common flowering plants, including trees
N.C - Become familiar with common names of flowers and plant structures
N.C - Identify and name a variety of common wild and garden plants
N.C - Identify and name a variety of deciduous and evergreen trees
N.C - Understand how plants change over time
N.C - Observe the growth of flowers they have planted
N.C - Become familiar with plant structures
N.C - Keep records of how plants change over time

1. Understand that seeds grow into plants
Identify a plant
Explain how to plant a seed
Predict what might happen to their seed

2. Identify the basic parts of a plant and tree
Say what is the same and what is different between 2 flowering plants
Correctly label the parts of a plant
Correctly label the parts of a tree

3. Understand that different plants can grow in the same environment
Make careful observations
Group plants according to their features
Record their ideas and provide explanations

4. Know the difference between deciduous and evergreen trees
Know that deciduous trees change throughout the year
Explain how a deciduous tree changes through the year
Make comparisons between a deciduous tree and an evergreen tree

5. Know that fruit trees and vegetables are varieties of plants
Understand that plants are a source of food
Make predictions
Record their findings in a table

6. Record the growth of a plant
Understand that plants grow over time

Record the growth of a plant
Measure the height of a plant and record how much it has grown

Working Scientifically -

- Asking simple questions
- Observing closely, using simple equipment
- Using their observations and ideas to suggest answers to questions
- Identifying and classifying
- Comparing and contrasting familiar plants
- Drawing diagrams showing the parts of different plants, including trees
- Make careful observations
- Group plants according to their features
- Record their ideas and provide explanations

Enquiry Approach –

- Observation over time - Observing changes that occur over a long or short period of time.
- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Research - Using information from a variety of sources to answer scientific questions.

Enquiry Skill –

- Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.

Key Vocabulary –

Predict, plant, tree, seed, oak, flower, root, leaf, petal, stem, weed, daisy, dandelion, wild, buttercup, evergreen, deciduous, seasons, bush, branch vegetable, farm, tractor, supermarket, fruit, observe, adult plant, seedling, young plant, growth

Animals including humans – All about Animals

In Year 1 we...

N.C - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

N.C - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)

N.C - Identify and name a variety of common animals that are carnivores, herbivores and omnivores

1. Discover animal families

Name a variety of common animals

Identify the 5 groups of animals

Describe the key characteristics of the 5 animal groups

2. Learn about the differences between mammals and birds

Name a variety of common birds and mammals

Name and describe a variety of common birds and mammals

Name, describe and compare a variety of common birds and mammals

3. Learn about the differences between amphibians, reptiles and fish

Name a variety of common amphibians, reptiles and fish

Name and describe a variety of common amphibians, reptiles and fish

Name, describe and compare a variety of common amphibians, reptiles and fish

4. Discover the type of food living things eat

Understand that animals eat different things

Group animals based on their diet

Explain the difference between herbivores, carnivores and omnivores

5. Explore the difference between wild animals and pets

Know that some animals are wild and some are kept as pets

Sort animals into those that are wild and those that are suitable for a pet

Describe the needs of a pet

6. Explain the characteristics of an animal

Draw and label an animal and talk about its characteristics

Draw and label an animal and write about its characteristics

Draw and label an animal and write about its characteristics, using some scientific language

Working Scientifically

- Grouping and sorting
- Using their observations and ideas to suggest answers to questions

Enquiry Approach

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Research - Using information from a variety of sources to answer scientific questions.

Enquiry Skill

- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Key Vocabulary –

Fish, amphibian, reptile, mammal, bird, warm-blooded, cold-blooded, herbivore, carnivore, omnivore.

Exploring everyday materials – unit 1

In Year 1 we...

N.C - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock
N.C - Distinguish between an object and the material it is made from
N.C - Describe the simple physical properties of a variety of everyday material
N.C - Compare and group together a variety of everyday materials on the basis of their simple physical properties

1. Identify and name a variety of everyday materials
Understand what a material is
Identify a variety of everyday materials
Describe everyday materials

2. Distinguish between an object and the material it is made from
Understand that all objects are made from materials
Identify what material an object is made from
Understand that different objects can be made from the same material

3. Describe the properties of everyday materials
Give simple descriptions of everyday materials
Describe the properties of everyday materials
Explain why materials are chosen for particular objects

4. Identify objects that are natural and those that are manmade
Understand that some materials are natural and some are manmade
Identify natural and manmade materials
Understand that natural and manmade materials are used for different purposes

5. Predict and identify if an object will float or sink
Understand that some objects float and some objects sink
Predict and identify if an object will float or sink
Predict and identify if an object will float or sink and explain if my prediction was correct

6. Explore which materials are best for different objects
Understand that some materials soak up water
Compare materials that are absorbent and not absorbent
Understand that non-absorbent materials are used in objects that need to be waterproof

Working Scientifically -

- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Performing simple tests
- Gathering and recording data to help in answering questions

Enquiry Approach –

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question.

Enquiry Skill –

- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry
- Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

Key Vocabulary -

Material, wood, metal, fabric, plastic, object, brick, glass, elastic, property, opaque, stiff, dull, transparent, rubber, polyester, factory, manmade, natural, submerge, float, predict, buoyant, sink, umbrella, waterproof, sponge, absorbent, soak

Exploring everyday materials – Unit 2

In Year 1 we...

N.C - Describe the simple physical properties of everyday materials
N.C - Compare and group together a variety of everyday materials on the basis of their simple physical properties

1. Build a structure strong enough to withstand wind
Identify and name some materials used in building a house
Describe the simple physical properties of materials used in building a house
Understand the suitability of materials used in building a house

2. Build a waterproof structure
Understand what waterproof means
Know what materials are waterproof
Understand why the roof of a house needs to be waterproof

3. Understand the properties of glass and its uses
Understand that glass is transparent
Understand why glass is used to make windows
Explain why glass is the best material to use for windows and why other materials might be unsuitable

4. Understand that materials are used to create a variety of furniture
Understand the properties of fabric
Understand that a variety of materials are sometimes used to make one object
Understand why specific materials are used to make furniture

5. Explore a variety of fabrics and understand their different properties
Understand that there are different types of fabrics
Understand that different fabrics have different properties
Understand that different fabrics have specific uses

6. Explain the uses of materials and why they are suitable
Identify and name a variety of everyday materials
Describe the simple physical properties of a variety of everyday materials
Explain the uses of materials and why they are suitable

Working Scientifically -

- Performing simple tests

- Using their observations and ideas to suggest answers to questions
- Identifying and classifying

Enquiry Skill –

- Setting up test - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry.

Enquiry Approach –

- Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question.
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.
- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.

Key Vocabulary –

Brick, solid, clay, strong, wind, roof, non-absorbent, waterproof, absorbent, slate, window frame, transparent, opaque, window pane, suitable, fabric Furniture, cotton, mattress, soft, jumper, wool, weather, evaluate, garden, material, tile, properties

Start of year 2/3 A

Animals including humans

In Year 2 we…	In Year 3 we...
N.C - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) **N.C - Describe the importance of exercise, eating the right amounts of different types of food and hygiene for humans** **Unit I:** **1/2 Describe the needs of animals/humans for survival** Understand the basic needs of animals and humans Explain the basic needs of animals and humans. Explain how animals adapt and survive by ensuring their basic needs are met Know the difference between basic human needs and the things humans want **3/4 Explore the importance of eating the right food and the importance of a balanced diet.** Name the 5 food groups and sort foods into those groups. Explain why the 5 food groups are important for human health Understand the importance of a balanced diet and give examples Understand that eating pre-cooked or processed food is not always a healthy choice **5/6 Investigate the impact of exercise on our bodies** Understand that exercising regularly is important for our health and how it impacts our bodies Explain how a good hygiene routine can stop the spread of germs and keep us healthy **Working Scientifically -** Using their observations and ideas to suggest answers to questions Identifying and classifying Performing simple tests - Using their observations and ideas to suggest answers to questions **Enquiry Approach -**	**N.C - 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** **N.C - Identify that humans and some other animals have skeletons and muscles for support, protection and movement** **1. Explore the 5 key food groups** Know that there are 5 key food groups Explain how many portions of food from different food groups we should eat in a day Explain how food from each food group is essential for human growth and health **2. Learn about the nutrition in the food we eat** Understand that food labels give information on the ingredients in food Understand that food labels help us make healthy choices Understand that food labels give in depth information about the different food groups within a product **3. Learn about the different types of skeletons** Understand that animals have different types of skeletons Identify which animals have an endoskeleton, exoskeleton and a hydrostatic skeleton Explain how animals' skeletons help them to move and survive **4. Learn about the human skeleton** Explain the functions of the human skeleton Identify the main bones in the human body Explain the functions of the main parts of the human body **5. Learn about animals and their skeletons** Match animals to their skeletons Identify how animals' skeletons have adapted to help them move in their environment Explain the functions of the bones within animal skeletons **6. Explore the role of muscles**

Research - Using information from a variety of sources to answer scientific questions.
Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

Enquiry Skill -

Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.

Unit 2:

N.C - Notice that animals, including humans, have offspring which grow into adults

1/2. Learn and describe how to order the stages of the human life cycle from adulthood to old age.

Order the stages of a human life cycle
Identify each stage of a human life cycle
Draw the human life cycle

3 Learn how to match offspring to their parent

Match offspring with their parents
Identify features inherited from a parent
Explain why some animals are more challenging to match

4. Explore and describe the life cycle of a chicken/caterpillar or frog

Compare the life cycle of a chicken and a human
Create a bar chart
Predict the height of a chick

5. Describe the life cycle of a butterfly

Name the different stages of a butterfly's life
Describe how a butterfly moves between the stages in its life cycle
Explain the life cycle of a butterfly and the process of metamorphosis

Working Scientifically -

- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions

Understand that we have voluntary and involuntary muscles
Become familiar with the names of some muscles in the human body
Explain how muscles work

Working Scientifically -

- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Using straightforward scientific evidence to answer questions or to support their findings
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Identifying differences, similarities or changes related to simple scientific ideas and processes

Enquiry Approach –

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Research - Using information from a variety of sources to answer scientific questions.
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill –

- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Enquiry Approach – • Research - Using information from a variety of sources to answer scientific questions**.** • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways**.** • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts**.** **Enquiry Skill –** • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.	

Electricity

In Year 2 we…	In Year 3 we…
Children covering electricity in year 2 will cover it again in year 4 and year 6 *Although electricity isn't a required topic for children to learn until Year 4, the majority of younger children will be familiar with many electrical appliances already, so they'll be in a good position to have Electricity Lessons in KS1. You can get your children ready for learning more about electricity with exercises like this sorting activity which will help them to identify what objects in the house runs on electricity. Children can also get ahead by becoming familiar with the names of electrical circuit symbols and the elements of an electrical circuit as this will be an essential topic in Year 4 as they'll be asked to conduct some experiments.* 1. Demonstrate their understanding that many everyday appliances require electricity and to group appliances into categories. 2. Electricity can be dangerous and that appliances must be used safely. Understand that some appliances are less dangerous than others. 3. Make a complete circuit using batteries, bulbs and wires and to make the bulb/buzzer work. 4. Know that circuits will not work if there is no battery present or there is a break in the circuit. To predict and investigate whether circuits will work from the drawings provided. 5. Know that the circuits made can be used to make simple devices.	**N.C - Identify common appliances that run on electricity** **N.C - Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers** **N.C - 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** **N.C - Recognise some common conductors and insulators and associate metals with being good conductors** **N.C - Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit** **1. Explore electrical appliances and electrical safety** Identify common appliances that run on electricity Understand the dangers of using electrical appliances Understand how to keep safe when using electrical appliances **2. Learn about electrical components in a series circuit** Identify electrical components Create a simple electrical circuit Explain how a simple electrical circuit works **3. Investigate electrical circuits** Create a simple electrical circuit Predict if a simple electrical circuit will work Know the difference between a complete and an incomplete circuit **4. Explore conductors and insulators** Understand the difference between an insulator and a conductor Investigate which objects are conductors and which are insulators Give examples of insulators and conductors in everyday appliances **5. Learn about electrical switches** Understand how a switch works Explain how an electrical switch works Apply knowledge of how a switch works to create a switch **6. Investigate how electrical components can change within a circuit** Pose an investigation question and make a prediction Set up an investigation to prove or disprove a prediction Set up an investigation to prove or disprove a prediction and provide a detailed conclusion

	Working Scientifically - • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using straightforward scientific evidence to answer questions or to support their findings. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. • Setting up simple practical enquiries and 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. • Asking relevant questions and using different types of scientific enquiries to answer them. **Enquiry Approach –** • Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. **Enquiry Skill –** • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations. • Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves. • Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry. • Asking questions - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research.

Forces and Magnetism

In Year 2 and 3	Year 2 and 3 have by this point covered all of the learning content for Key Stage 1 Everyday materials. Therefore, both year groups should access this learning differentiated as appropriate. Topic will be visited again in class 3 during upper key stage 2.

N.C - Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
N.C -Compare how things move on different surfaces
N.C - Describe magnets as having 2 poles
N.C - Predict whether 2 magnets will attract or repel each other, depending on which poles are facing
N.C - 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

1. Explore contact and non-contact forces
Identify different types of forces
Identify different types of forces and describe the effect they have on an object
Identify different types of forces and explain how they impact the movement of an object

2. Compare how things move on different surfaces
Compare how things move on different surfaces
Explain why some surfaces slow objects down
Explain how friction can be increased or decreased

3. Explore different types of magnets
Describe magnets as having two poles
Name some different types of magnet
Identify some everyday uses for magnets

4. Explore the properties of magnets and everyday objects that are magnetic
Understand how magnetic materials behave
Identify a range of materials which are magnetic
Compare and group materials based on their magnetic properties

5. Understand that magnetic forces can act at a distance
Observe how magnetic forces act at a distance
Understand how magnetic forces can act at a distance
Explain how magnetic forces act at a distance

6. Explore the everyday uses of magnets
Understand what a compass is and how it works
Understand what the four main compass points are
Explain how a compass works

Working Scientifically -

- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units
- Using a range of equipment, including thermometers and data loggers
- Setting up simple practical enquiries and comparative and fair tests
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables

Enquiry Approach –

- Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question.
- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill –

- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.
- Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.

Living things and their habitats

In Year 2 we…	In Year 3 we...
N.C - Explore and compare the differences between things that are living, dead, and things that have never been alive **N.C - Identify and name a variety of plants and animals in their habitats, including microhabitats** **N.C - Describe how animals obtain their food from plants and other animals** **Unit 1:** **1. Compare the differences between things that are living, dead, and things which have never been alive** Understand that there are things that are living, dead or have never been alive Identify and classify objects into living, dead or never been alive Understand the 7 characteristics of living things **2/3 Identify and name a variety of plants and animals in a microhabitat** **Design a suitable microhabitat where living things could survive** Know the difference between a habitat and a microhabitat Identify and name a range of microhabitats Understand that living things need certain conditions to survive Understand that living things depend on each other for survival **4. Find out what animals eat to survive in their habitats** Understand that all animals need to eat to survive Find out what specific animals eat through research Ask diverse questions to find out what animals eat and where they find their food **Working Scientifically** Identifying and classifying Observing closely, using simple equipment Asking simple questions and recognising that they can be answered in different ways Gathering and recording data to help in answering questions **Enquiry Approach –** Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. Research - Using information from a variety of sources to answer scientific questions.	*The lesson presentation will recap some of the Year 2 learning from the unit 'Habitats from around the World' to prepare the children for a more in-depth understanding of living things and their habitats* **N.C - Recognise that living things can be grouped in a variety of ways** **N.C - Making a guide to local living things (non-statutory)** **N.C - 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 the local and wider environment** **N.C - Explore and use classification keys to help group, identify and name a variety of living things in the local and wider environment** **1. Explore different habitats** Understand that living things are suited to different environments Group living things according to the environment they are suited to Identify the similarities between animals that live in the same habitat **2. Research a habitat** Describe habitats that are found in the UK Research key facts about a habitat and report on the climate, temperature and type of soil and water they would typically find there Research and describe habitats that are found in the UK and the threats that living things face **3. Explore how animals can be classified** Identify different ways to classify animals into groups Organise animals into different classification groups Begin to organise animals into different classification groups and sub-groups **4. Create a classification key** Understand how to interpret a classification key Create a classification key using a series of questions Create a complex classification key using a series of questions that group animals into sub-groups before identifying the species **5. Adaptations and classification within species** Understand that animals adapt to suit their environment Describe how animals adapt to their environment Apply knowledge of adaptations to create a classification key for a ‘new’ species

Enquiry Skill –
Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Unit 2:

N.C - 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
N.C - Identify and name a variety of plants and animals in their habitats, including microhabitats

2. Appreciate that environments are constantly changing
Appreciate that environments are constantly changing
Identify what you can do to help reduce the impact humans have on a habitat
Know what you can do to care for a habitat

3. Explore the rainforest and its problems
Understand why rainforests are important
Identify how rainforests are endangered
Plan a campaign to help protect a rainforest

4. Describe life in the ocean
Learn about different ocean life
Understand an ocean habitat
Learn about the blue whale

5**. Discover the Arctic and Antarctic habitat**
Identify the differences between the Arctic and Antarctic
Identify the animals which live in both polar habitats
Describe the Arctic and Antarctic climates

Working Scientifically -

- Gathering and recording data to help in answering questions
- Using their observations and ideas to suggest answers to questions
- Asking simple questions and recognising that they can be answered in different ways
- identifying and classifying

Enquiry Approach –

- Research - information from a variety of sources to answer scientific questions.

6. Explore and classify pond plants
Name some plants that live in a pond habitat
Describe plants that live in a pond habitat
Classify and sort plants that live in pond habitat

Working Scientifically -

- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- 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

Enquiry Approach –

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Research - Using information from a variety of sources to answer scientific questions.
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill –

- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

• Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. **Enquiry Skill –** • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations. • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.	

Rocks

In Years 2 and 3 we…	Rocks have been raised when exploring materials during years 1 and 2, this is the first-time children explore the properties of rocks and how they have been formed and how they can be used. This topic is not covered discretely again.

N.C - Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
N.C - Explore how and why [rocks] might have changed over time (non-statutory)
N.C - Recognise that soils are made from rocks and organic matter

1. Explore the formation and properties of igneous rocks
Understand that igneous rocks come from beneath the Earth's surface
Explain how igneous rocks are formed on Earth's surface
Explain the difference between intrusive and extrusive igneous rock

2. Explore the formation and properties of sedimentary and metamorphic rocks
Know the three types of rock that are formed on Earth
Identify the properties of rocks by carrying out tests
Explain the difference between igneous, sedimentary and metamorphic rocks following an investigation

3. Weathering and the suitability of rocks for different purposes
Identify the different types of weathering
Define the different types of weathering and know the effects they have on rocks
Explain the effects weathering has on rocks and evaluate the best type of rocks to use for certain tasks

4. Explore how water contributes to the weathering of rocks
Understand that water can cause rocks to erode
Explain how water causes rocks to erode
Explain how water causes rocks to erode and why it is important to understand this

5. Understand how fossils are formed
Understand what a fossil is
Understand how a fossil is created
Explain how a fossil is created

6. Explore different types of soil
Name some different types of soil
Describe the properties of different soils
Research which type of soil certain flowers and vegetables grow better in

Working Scientifically

- 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
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units
- Using a range of equipment, including thermometers and data loggers

- Identifying differences, similarities or changes related to simple scientific ideas and processes

Enquiry Approach –

- Research - Using information from a variety of sources to answer scientific questions.
- Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question
- Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry.

Enquiry Skill –

- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.
- Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.

Plants

In Year 2 we…

N.C - Observe and describe how seeds and bulbs grow into mature plants
N.C - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy
N.C - Understand the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants

1. Know the difference between seeds and bulbs
Observe and talk about seeds and bulbs
Draw the inside of a seed and a bulb
Explain the difference between a bulb and a seed

2. Design an experiment to find out what plants need to grow
Set up an experiment to find out what plants need to grow
Make a prediction
Set up a fair test

3. Describe what plants need to grow and stay healthy
Understand that plants need space, water, sunlight and a suitable temperature to grow
Explain how a plant makes its own food through the process of photosynthesis
Explain that plants use carbon dioxide, sunlight and water to create glucose

4. Describe the life cycle of a plant
Understand the life cycle of a plant
Produce a diagram to explain the life cycle of a plant
Provide scientific explanations of the life cycle of a plant

5. Observe and record the growth of plants over time
Record results and write a simple conclusion
Compare the results to their prediction
Explain why their plant did or did not thrive using the control plant as a comparison

6. Understand that plants adapt to suit their environment
Identify and sort plants according to their habitats
Describe what conditions might be like for plants in their habitats
Explain how plants adapt to suit their environment

Working Scientifically -

- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Observing and recording, with some accuracy

In Year 3 we...

N.C - 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
N.C - Identify and describe the functions of different parts of a flowering plant
N.C - Investigate the way in which water is transported within plants
N.C - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

1. Compare the effect of different factors on plant growth
Plan and set up an experiment that compares the effect of different factors on the growth of a plant
Set up a fair test
Ask scientific questions and suggest different ways to answer them

2. Describe the functions of different parts of a flowering plant and how they are used in photosynthesis
Identify the parts of a plant
Draw and label a diagram to show the parts of a plant
Describe the functions of a flowering plant

3. Investigate the way in which water is transported within plants
Understand how water is transported within plants
Create an observational drawing to show how water is transported through a plant
Describe how water is transported through a plant

4. Explore the part that flowers play in the life cycle of flowering plants
Identify the reproductive parts in a flower
Explain the functions of the reproductive parts in a flower
Explain how flowering plants reproduce

5. Understand the pollination process and the ways in which seeds are dispersed
Understand that seed dispersal is a way in which some plants reproduce
Provide an explanation, both written and verbal, to show how plants reproduce
Use scientific language to describe how plants reproduce

6. Compare the effect of different factors on plant growth
Explain the results of an experiment
Write up the results of an experiment
Provide a conclusion using scientific language and diagrams

• Asking simple questions and recognising that they can be answered in different ways • Performing simple tests • Using their observations and ideas to suggest answers to questions • Identifying and classifying **Enquiry Approach –** • Research - Using information from a variety of sources to answer scientific questions. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts. • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. **Enquiry Skill –** • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry • Asking questions - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research. • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations	**Working Scientifically -** • Asking relevant questions and using different types of scientific enquiries to answer them. • Setting up simple practical enquiries and comparative and fair tests • Making systematic and careful observations. • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • 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 • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions **Enquiry Skill –** • Asking questions - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research. • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry. • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. **Enquiry Approach –** • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question**.** • Research - Using information from a variety of sources to answer scientific questions. • Observation over time - Observing changes that occur over a long or short period of time. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts.

End of A year2/3

Start of 4/5/6 year A

Earth and Space

In Year 4, 5 and 6	**Topic only covered in year 5, if children complete this unit of work in year 4 they will revisit in year 6. Children will deepen their understanding and possibly complete a set research project.**

N.C - Describe the Sun, Earth and Moon as approximately spherical bodies
N.C - Describe the movement of the Earth and other planets relative to the Sun in the solar system
N.C -Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky
N.C - Describe the movement of the Moon relative to the Earth

1. Explore the solar system and its planets
Name key characteristics of a planet
Understand the order of the planets from the Sun
Describe the Sun, Earth, moon and other celestial bodies as spheres

2. Understand the heliocentric model of the solar system
Understand the differences between a heliocentric and geocentric model of the solar system
Understand how attitudes and knowledge can change and adapt over time
Represent visual characteristics of a planet

3. Explain the Earth's movement in space
Understand how Earth moves in space
Understand how the Sun transitions across the sky
Understand how night and day happen

4. Explain the Earth's rotation and night and day
Understand that time can be different in various parts of the world
Understand how time can be recorded using a 'solar clock'
Understand how the Sun transitions across the sky

5. Explain the movement of the Moon
Describe how the Earth and Moon move relative to the Sun
Describe the movement of the Moon relative to the Earth
Explain that the Moon orbits the Earth, not the Sun

6. Design a planet using knowledge gained
Create a representation of their knowledge of the planets and space using their imagination
Describe the characteristics of a planet
Understand that all planets are different to one another

Working Scientifically-

- Identifying scientific evidence that has been used to support or refute ideas or arguments
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision and taking repeat readings when appropriate
- 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
- Use a model to answer questions
- Using test results to make predictions to set up further comparative and fair tests

Enquiry Approach –

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Research - Using information from a variety of sources to answer scientific questions.
- Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts.
- Observation over time - Observing changes that occur over a long or short period of time.

Enquiry Skill –

- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.
- Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.

Light

In Year 4 we…	In Year 5 and 6 we…
N.C - Recognise that they need light in order to see things and that dark is the absence of light **N.C - Recognise that light from the sun can be dangerous and that there are ways to protect their eyes** **N.C - Notice that light is reflected from surfaces** **N.C - Recognise that shadows are formed when the light from a light source is blocked by an opaque object** **N.C - Find patterns in the way that the size of shadows change.** **1. Identify the difference between light sources and non-light sources** Identify light sources Understand the difference between natural and artificial sources of light Explain why certain objects are sources of light and why others are not **2. Explore the light that comes from the sun and how to stay safe** Understand that sunlight can damage our skin and our eyes Observe the effectiveness of sun cream as protection against the sunlight Using scientific evidence, explain the effectiveness of sun cream as protection against the sunlight **3. Explore materials which are reflective** Understand that some objects are a light source and some are reflectors Identify materials that are good reflectors Explain why some materials are better reflectors than others **4. Discover how shadows are formed** Understand that a shadow is formed when an object blocks the light Explain how a shadow is formed when an opaque object blocks the light Understand that the size of a shadow changes when it is moved further from the light **5. Investigate how shadows change throughout the day** Understand that shadows change throughout the day Explain how shadows change throughout the day Explain how and why shadows change throughout the day **6. Investigate how you can change the size of a shadow** Understand that the size and shape of a shadow can change Know how to change the size and shape of a shadow	**N.C - Recognise that light appears to travel in straight lines** **N.C - 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** **1. Explore how light travels** Understand that light appears to travel in straight lines Understand how to draw a scientific diagram Understand how to draw a scientific diagram that helps support what you have found out **2. Explore reflection** Understand that light is reflected off of surfaces so that we can see it Understand how to set up a fair test and carry it out Understand how to draw conclusions based on findings **3. Explore reflection and explain how it can be used to help us see** Understand that light can be reflected off multiple surfaces so that we can see it Understand how to make a periscope to reflect an image Understand how to explain how an unseen image can be seen using a scientific diagram **4. Investigate how shadows can change** Understand that shadows change length depending on how far away they are from a light source Understand how to collect data Understand how to display data to support findings **5. Investigate how we can show why shadows have the same shape as the object that casts them** Understand how to create a shadow Understand where to position the sun shades to create the most shade Understand how to feedback information based on findings **6. Explore light phenomena** Understand the basics behind how light is refracted, how a rainbow is made and what happens when light hits a bubble Understand how light is used other than for us to see Understand how our eyes respond to light

Explain why the size and shape of a shadow can change **Working Scientifically -** • 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 • Identifying differences, similarities or changes related to simple scientific ideas and processes **Enquiry Approach –** • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts. • Observation over time - Observing changes that occur over a long or short period of time. **Enquiry Skill –** • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.	**Working Scientifically** • Record data and results of increasing complexity using scientific diagrams and labels • Identifying scientific evidence that has been used to support or refute ideas or arguments • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs • 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 **Enquiry Approach –** • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. • Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts. **Enquiry Skill –** • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves. • Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

	• Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations. • Asking questions - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research.

Animals including Humans

In Year 4 we…

N.C - Describe the simple functions of the basic parts of the digestive system in humans
N.C - Identify the different types of teeth in humans and their simple functions
N.C - Construct and interpret a variety of food chains, identifying producers, predators and prey

1. Identify the organs in the digestive system
Identify the main organs of the human digestive system
Create an accurate diagram of the main organs of the human digestive system
Explain the role of the digestive system and the organs within it

2. Describe the functions of the main organs in the digestive system
Describe the functions of the organs in the digestive system
Use a model of the digestive system to explain the journey of food
Explain how the equipment used in the model relates to the digestive system

3. Identify the types of human teeth and their functions
Identify the different types of human teeth
Explain the functions of the different types of human teeth
Explain why humans have 2 sets of human teeth

4. Investigate the effects of different liquids on the teeth
Observe and record the effect of each liquid
Draw conclusions from the investigation
Explain how to care for your teeth

5. Understand food chains
Identify the key parts of a food chain
Create a food chain within a chosen ecosystem
Explain why it is important to keep food chains balanced

6. Explore food webs
Research living things within a chosen ecosystem
Create a food web for a chosen ecosystem
Identify threats to living things within their chosen ecosystem

Working Scientifically -

- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
- Making systematic and careful observations
- Reporting on findings from enquiries, including oral and written explanations
- Setting up simple practical enquiries and comparative and fair tests

In Year 5 and 6 we...

N.C –Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood
N.C - Describe the ways in which nutrients and water are transported within animals, including humans
N.C -Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function

1. Understand the function of the heart and its role in the circulatory system
Describe the structure and function of the heart
Identify oxygenated and deoxygenated blood
Describe how the blood moves around the heart

2. Identify and compare blood vessels
Define the function of different blood vessels
Explore issues surrounding restricted arteries
Explain the movement of blood through the heart

3. Explore blood
Describe the composition of the blood
Create a pie chart to explain the composition of the blood
Explain the function of cells within the blood

4. Learn how the body transports water and nutrients
Explain how water and nutrients are transported
Define osmosis and diffusion
Explain the importance of diffusion and osmosis

5. Investigate what affects your heart rate
Accurately measure pulse
Design an investigation associated with heart rate, diet and exercise
Describe how lifestyle choices can affect health

6. Learn about the impact of drugs and alcohol on the body
Define the uses of different drugs
Describe the impact of drugs/alcohol on health
Describe some drugs used to support the circulatory system

Working Scientifically -

- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs

• Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Enquiry Approach – • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts. • Research - Using information from a variety of sources to answer scientific questions. Enquiry Skill – • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations. • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.	• Taking measurements and using a range of scientific equipment, with increasing accuracy and precision; taking repeat readings when appropriate • Identifying scientific evidence that has been used to support or refute ideas or arguments • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • 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 Enquiry Approach – • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. Enquiry Skill – • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry. • Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves. • Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry. • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.

Sound

In Year 4 we…

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

1. Identify how sounds are made
Understand that sound is created by vibrations
Explain how sound is created and how it travels from an object to the ear
Explain how sound is created, travels and is interpreted by the brain

2. Explore how vibrations from sounds travel through a medium to the ear
Understand that sounds can travel through air, liquids and solids
Explain how sound waves travel through air, liquids and solids
Compare how sound waves travel through air, liquids and solids

3. Explore sound insulation
Understand that some materials absorb sound and some materials reflect sound
Understand that materials that absorb sound are sound insulators
Explain why some materials absorb sound

4. Explore volume
Understand that the volume of sound is measured in decibels
Understand that the volume of a sound is dependent on how much energy or power the sound source is given
Understand that as the volume of sound increases so too does the amplitude, or height, of the sound waves

5. Explore pitch
Understand that pitch is how low or high a sound is
Understand that pitch is caused by the speed of the sound source's vibrations
Understand how a sound wave is different for a high pitch and a low pitch

6. Explore sounds from near and from far
Understand that sound fades as it travels
Understand why sound fades as it travels
Explain the relationship between distance and volume

Working Scientifically

- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Setting up simple practical enquiries and 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
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables

Enquiry Approach –

- Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways.
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.
- Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts.
- Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question.

Enquiry Skill –

- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.
- Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.
- Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings.
- Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry.

Forces

In Years 4, 5 and 6	Year 4 children will have covered forces while in class two, they will also revisit this unit of work if cover previously in year 2

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

1. Explore gravity and the life and work of Isaac Newton
Explore the life and work of Isaac Newton
Understand the influence gravity has on the universe
Investigate the relationship between mass and gravity

2. Examine the connection between air resistance and parachutes
Understand how air resistance acts on objects
Design and test parachutes, using averages to get more accurate results
Draw an accurate diagram of the forces acting on a parachute and explain their purpose

3. Explore factors which affect water resistance
Understand water resistance
Describe the forces acting on an object floating in water
Identify the similarities and differences between air and water resistance

4. Investigate the effects of friction on different surfaces
Understand how friction acts on objects
Accurately use a Newton meter to measure a force
Describe ways of changing the size of a frictional force

5. Investigate mechanisms – levers and pulleys
Name the forces acting on a range of objects
Describe the effect forces can have on an object
Explain how gears work

6. Investigate mechanisms – gears
Explain how gears work and their purpose
Create a set of interacting gears
Notice patterns in the workings of gears

Working Scientifically -

- Identifying scientific evidence that has been used to support or refute ideas or arguments
- Taking measurements and using a range of scientific equipment with increasing accuracy and precision; taking repeat readings when appropriate
- 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
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

Enquiry Approach –

- Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question.
- Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions.

Enquiry Skill –

- Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry.
- Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves.
- Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations.
- Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry.
- Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.

Electricity

In Year 4 we...	In years 5/6
N.C - Identify common appliances that run on electricity **N.C - Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers** **N.C - 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** **N.C - Recognise some common conductors and insulators and associate metals with being good conductors** **N.C - Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit** **1. Explore electrical appliances and electrical safety** Identify common appliances that run on electricity Understand the dangers of using electrical appliances Understand how to keep safe when using electrical appliances **2. Learn about electrical components in a series circuit** Identify electrical components Create a simple electrical circuit Explain how a simple electrical circuit works **3. Investigate electrical circuits** Create a simple electrical circuit Predict if a simple electrical circuit will work Know the difference between a complete and an incomplete circuit **4. Explore conductors and insulators** Understand the difference between an insulator and a conductor Investigate which objects are conductors and which are insulators Give examples of insulators and conductors in everyday appliances **5. Learn about electrical switches** Understand how a switch works Explain how an electrical switch works Apply knowledge of how a switch works to create a switch **6. Investigate how electrical components can change within a circuit** Pose an investigation question and make a prediction Set up an investigation to prove or disprove a prediction	**N.C - Use recognised symbols when representing a simple circuit in a diagram** **N.C - Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit** **N.C - 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** **1. Describe the parts of an electric circuit** Create a simple electrical circuit Identify components from their symbol and definition Create an accurate circuit diagram **2. Explore voltage and its effect on an electrical circuit** Create more complex electrical circuits Use a voltmeter to measure voltage Describe how the brightness of a bulb is affected by the voltage/number of cells in the circuit **3. Apply knowledge to identify and correct problems in a circuit** Identify problems in a circuit Use technology to create online circuits Explain how to fix issues in a circuit **4. Investigate what affects the output of a circuit** Identify possible variables for an investigation Design and conduct an investigation Explain what affects the output of a circuit **5. Build a set of traffic lights** Create a switch Design and create a set of traffic lights Explain how their traffic lights work **6. Apply knowledge of conductors and insulators** Identify electrical conductors and insulators Follow instructions to create a loop and wire game Explain how the loop and wire game works

Set up an investigation to prove or disprove a prediction and provide a detailed conclusion **Working Scientifically -** • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using straightforward scientific evidence to answer questions or to support their findings. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. • Setting up simple practical enquiries and 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. • Asking relevant questions and using different types of scientific enquiries to answer them. **Enquiry Approach –** • Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions. • Pattern-seeking - Identifying patterns and looking for relationships to make links between scientific concepts. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. **Enquiry Skill –** • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations. • Setting up tests - Carefully following a method and using equipment accurately to carry out a scientific enquiry. The method may be designed by teachers or children themselves. • Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry. • Asking questions - Asking relevant questions that can be answered from their learning of scientific concepts. This may be through scientific enquiries, applying prior knowledge or research.	**Working Scientifically** • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs • 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 • 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 • Using test results to make predictions to set up further comparative and fair tests **Enquiry Approach –** • Identifying, grouping & classifying - Using observations, data and findings to name, label and organise items in a variety of ways. • Comparative / fair testing - Conducting a test that controls all but one variable to answer a scientific question. • Problem-solving - Applying prior scientific knowledge to solve problems and answer further questions. **Enquiry Skill –** • Recording data, results and findings - Using tables, a variety of graphs, labelled diagrams and models to record observations, measurements, results and findings. • Making predictions - Using prior knowledge to make informed suggestions on what may happen in a scientific enquiry. • Interpreting and communicating results - Using information, results and data to present findings, including oral and written explanations • Evaluating - Assessing the success of a scientific enquiry by evaluating the prediction, method and results and identifying further questions for enquiry. • Observing and measuring - Using the senses and taking measurements, using a range of equipment, to make observations about a scientific enquiry.