



Nourishing the fitrah of each unique child

Science Policy

“Verily! In the creation of the heavens and the earth, and in the alternation of night and day, there are indeed signs for people of understanding. Those who remember Allaah standing, sitting, and lying down on their sides, and think deeply about the creation of the heavens and the earth, (saying): "Our Lord! You have not created (all) this without purpose, glory to You!”

(Surah Al Imran: 190 - 191)

Updated: January 2024	Review date: January 2025	Science Coordinator: Hawwa Mbombo
--------------------------	------------------------------	--------------------------------------



Science Policy

At Unique Academy, we understand that science education is an important part of our appreciation of the environment in which Allaah created for us to dwell within. Learning about science enables us to interpret the world and we must utilise real experiences whenever possible. Science education offers practical opportunities for careful observation, measurement, experimentation and communication in a variety of forms.

Aims

We aim to:

- Give children many different experiences which can be recorded in many different ways.
- Help children to develop scientific skills and knowledge.
- Teach children to use equipment safely.
- Enable children to have an understanding of the world around them.
- Teach in a way that allows children to be able to work both independently and collaboratively to develop enquiring minds.
- Help build children's confidence to select the most appropriate tools, techniques and materials themselves.
- Promote the children's understanding and use of scientific language.
- Foster confidence in and enjoyment of science.

Intent

At Unique Academy, it is our intention to develop young children's lifelong curiosity and interest in the sciences, as it is encouraged in the Qur'aan for us to observe, ponder, reflect and think deeply about the creation of the heavens and earth. When planning for the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. Children will learn to consolidate and retain the science knowledge they have learnt and teaching will also reinforce key scientific vocabulary from each unit. Our Science schemes of work will ensure that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS 2.

In Reception, the children follow the Early Years Foundation Stage (EYFS) framework, where science makes a significant contribution to achieving the Early Learning Goal for Understanding the World.

Implementation

The acquisition of key scientific knowledge is an integral part of our science lessons. Children will also develop key scientific competencies such as how to hypothesise and predict, experiment and record. Children will learn to retain important, useful and powerful vocabulary and knowledge contained within each unit. The progression of skills for working scientifically will be developed through the year groups and scientific enquiry skills will be of key importance within lessons. The progression of these skills is set out in the Science Progression Map below. Each lesson has a clear focus. Scientific knowledge and enquiry skills developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. Children will also have the opportunity to recap concepts where necessary. Our sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning. There is also the opportunity to regularly review and evaluate children's understanding. We aim to ensure that activities are effectively differentiated so that all children have an appropriate level of support and challenge. Teachers are to be equipped with secure scientific subject knowledge, in order to deliver high-quality teaching and learning and to also be able to address possible scientific misconceptions in topics. Educational visits will be

undertaken where appropriate to stimulate children's interest. Unique Academy staff will try to teach in meaningful everyday contexts, so that children can relate science to their everyday life experiences.

Impact

At Unique Academy Science, progress is measured through a child's ability to know more, remember more and explain more. This can be measured by key questions which are embedded into the lesson for ongoing assessment. Attainment and progress is measured across the school using our assessment system (Target Tracker). The impact of using the full range of resources included in science will also be seen across the school with an increase in the profile of science. The learning environment across the school will be more consistent with science technical vocabulary displayed, spoken and used by all learners. Whole-school and parental engagement will be improved through the use of science-specific home learning tasks. At Unique Academy, we would like children to develop confidence in their science knowledge and enquiry skills to be excited about science and to learn more. We would like children to see the relevance of what they learn in science lessons to real-life situations, realise the importance of science in the real world and develop an appreciation for Allaah and what He has created and facilitated for mankind.

Equal Opportunities

Equal opportunities in science education will be given to all children irrespective of their race, gender, culture or special needs.

Assessment and Record Keeping

Assessment will be ongoing, (at the end of each topic covered using Rising Stars Assessments) and will be made on Target Tracker at the end of each term, in relation to NC objectives.

Individual records will be kept, and passed on to the next teacher, at the end of the academic year. Staff will use samples of work they have kept to ensure a uniform level of expectation running through the school.

Cross-curricular links

Teachers should seek to provide links between Tawheed (monotheism) and Science. e.g. – understanding that Allaah is the Creator and Sustainer of all that is in the heavens and earth.

Teachers should seek to foster Literacy skills in Science and link Science to the teaching of hours. e.g. – presentation skills in writing an investigation. Writing flow diagrams for the water cycle.

Teachers should seek to foster Numeracy skills in Science and link Science to the teaching of Mathematics. e.g. – using a stopwatch and recording digital time. Reading/ writing/ interpreting graphs.

Computing should be used to enhance scientific learning and enquiry through the use of control equipment e.g. data logging.

The Learning Environment

The profile of science in the school reflects its place as a core subject. All classrooms have a science display showing the work being taught and incorporating a prominent display of the relevant scientific vocabulary and key questions. Resources for the block of work being covered should be appropriately accessible.

Resources

Resources will be kept in a dedicated resources room in clearly labelled storage boxes. Staff will be responsible for the tidiness and selection of resources as and when needed.

If any resource is used up, the school administrator should be notified to ensure prompt re-ordering. Suitable and helpful science texts and reading materials will be made available in the cupboard for staff to borrow.

Health and Safety

At Unique Academy staff will teach the children safe practice during science work. Children will:

- NOT be allowed to use sharp knives.
- Be instructed to wash their hands before and after handling foodstuffs and after handling soil and any other substances.

Any Health and Safety issues where uncertainty exists, should be clarified with the Headteacher.

Monitoring Of The Science Policy

The science policy will be monitored by the Headteacher.

Evaluation

The policy will be evaluated against certain criteria:-

- Results at the end of the academic year
- Progress made by the children on assessment.
- National Curriculum Science level descriptors
- Staff views and discussions.
- INSET or CPD undertaken by any staff members
- Work and planning scrutiny made by the Headteacher.



Science Curriculum Map

Class	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 1	Animals, including humans <i>Amazing me!</i>	Everyday materials <i>Brilliant builders</i>	Animals including humans <i>Wild and wonderful creatures</i>	Seasonal changes <i>Wild weather</i>	Plants <i>Growing things</i>	Living things and their habitats <i>Food</i>
Year 2	Animals, including humans <i>Healthy animals</i>	Living things and their habitats <i>Habitats</i>	Everyday materials <i>Materials matter</i>	Everyday Materials <i>Squash, bend, twist, stretch</i>	Plants <i>Ready, steady, grow</i>	Living things and their habitats <i>Gardens and allotments</i>
Cycle A Year 3 / 4	Forces and Magnets <i>Magnetic fun and games</i>	Animals, including humans <i>Fit for success</i>	Living things and their habitats <i>A world of living things</i>	Plants <i>Feast of flowers, fruits and seeds</i>	States of matter <i>What's the matter?</i>	Sound <i>Sound spectacular</i>
Cycle B Year 3 / 4	Rocks <i>This plant rocks</i>	Light <i>Shining the light</i>	Living things and their habitats <i>Habitat helpers</i>	Plants <i>Greatly green growers</i>	Animals including humans <i>The circle of life</i>	Electricity <i>Electric personalities</i>
Cycle A Year 5 / 6	Forces <i>Welcome to force land</i>	Earth and Space <i>Space!</i>	Living things and their habitats <i>Illustrating life cycles</i>	Animals including humans <i>The human species</i>	Properties of materials <i>Special effects materials</i>	Properties of materials <i>Material consultants</i>
Cycle B Year 5 / 6	Living things and their habitats <i>The classification code</i>	Block A <i>Medical manoeuvres</i>	Electricity <i>Electric Art!</i>	Block B <i>Sensational Science</i>	Light <i>Lighting technicians</i>	Inheritance



Progression Map

EYFS

Science		
Three and Four-Year-Olds	Communication and Language	<ul style="list-style-type: none"> Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	<ul style="list-style-type: none"> Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World	<ul style="list-style-type: none"> Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Begin to make sense of their own life-story and family's history. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.

Reception	Communication and Language		<ul style="list-style-type: none"> ● Learn new vocabulary. ● Ask questions to find out more and to check what has been said to them. ● Articulate their ideas and thoughts in well-formed sentences. ● Describe events in some detail. ● Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. ● Use new vocabulary in different contexts.
	Personal, Social and Emotional Development		<ul style="list-style-type: none"> ● Know and talk about the different factors that support their overall health and wellbeing: ● regular physical activity ● healthy eating ● toothbrushing ● sensible amounts of 'screen time' ● having a good sleep routine ● being a safe pedestrian
	Understanding the World		<ul style="list-style-type: none"> ● Explore the natural world around them. ● Describe what they see, hear and feel while they are outside. ● Recognise some environments that are different to the one in which they live. ● Understand the effect of changing seasons on the natural world around them.
ELG	Communication and Language	Listening, Attention and Understanding	<ul style="list-style-type: none"> ● Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> ● Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	The Natural World	<ul style="list-style-type: none"> ● 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.

Key Stage 1 National Curriculum Objectives

Autumn 1 – Animals including Humans

Amazing Me!

Think carefully about what you were like as a baby. Look at the differences in your body, compare foot and hand sizes and make a class display. Consider how to investigate what we can hear in the playground. Investigate fruit and vegetables and plan a balanced picnic for guests.

Animals, including humans (1AH)

- i) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Animals, including humans (2AH)

- i) notice that animals, including humans, have offspring which grow into adults.
- ii) find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- iii) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Working scientifically (KS1 WS)

- 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.

Autumn 2 – Seasonal Changes

Wild Weather!

In this block, think about the weather, learn how to present data and make your own weather forecast to present to the class.

Play shadow tag and create bar charts to record shadow length over time. Set up rain gauges to observe rainfall and bring all the learning together in a recorded weather forecast for the school website

Seasonal Changes (1SC)

- i) observe changes across the four seasons.
- ii) observe and describe weather associated with the seasons and how day length varies.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.

Spring 1 – Everyday Materials

Brilliant builders! Choosing the best materials

Explore different materials and sort them into groups before writing songs based on their properties! Consider what it would be like if the tables were made of jelly or the chairs were chocolate! Then recreate the story of the three little pigs and predict what will happen to their houses.

Everyday materials (1EM)

- i) distinguish between an object and the material from which it is made.
- ii) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- iii) describe the simple physical properties of a variety of everyday materials.
- iv) compare and group together a variety of everyday materials on the basis of their simple physical properties.

Uses of everyday materials (2EM)

- i) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- ii) find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.

Spring 2 – Plants**Growing Things**

Explore outside and prepare tubs for planting potatoes. Record the growth of a bean and look at how it develops. Can you recreate the plant with craft materials? Can you label the parts of the plant?

Look really closely at little cress plants and draw what you see. Then pop them into egg sandwiches for an egg and cress snack!

Plants (1P)

- i) identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- ii) identify and describe the basic structure of a variety of common flowering plants, including trees.

Plants (2P)

- i) observe and describe how seeds and bulbs grow into mature plants
- ii) find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions
- vi) gathering and recording data to help in answering questions.

Summer 1 – Animals, including humans**Wild and Wonderful Creatures**

Using plastic animal toys, sort them into different groups and learn all about carnivores, herbivores and omnivores.

Create shoebox dioramas for the animal toy and annotate with researched information.

Make a micro-safari for a toy car, with a recorded message for the pretend drivers!

Animals, including humans (1AH)

Pupils should be taught to:

- i) identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates
- ii) identify and name a variety of common animals that are carnivores, herbivores and omnivores
- iii) describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, and including pets)
- iv) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Animals, including humans (2AH)

- i) notice that animals, including humans, have offspring which grow into adults.
- ii) find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- iii) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions
- vi) gathering and recording data to help in answering questions.

Summer 2 - Animal Life Cycles

Food Chains

Talk about food chains and role play the interdependence between creatures in a chain, considering what part each plays in its survival. Then explore the school grounds, looking for examples of food chains.

Learn about water food chains and reconstruct in tanks of water using found materials, toys and laminated images. Make plastic bag jellyfish and invite others to visit the classroom

'aquarium'. Place information signs around the aquarium. Interpret the transfer of energy in a food chain through a dance, using masks and torches

Living things and their habitats (2LvH)

- i) explore and compare the differences between things that are living, dead, and things that have never been alive
- ii) 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
- iii) identify and name a variety of plants and animals in their habitats, including micro-habitats
- iv) describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions
- vi) gathering and recording data to help in answering questions.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions.

Year 2

Autumn 1 – Animals including Humans

People and their Pets

Observe creatures in the school grounds, photograph them and make sketches. Collect woodlice and set up different colonies in the classroom based on what they know about their habitats.

Discuss what sort of paper will be best for the job of mopping up a puppy's accident and plan an investigation to test.

Talk about and design a good pet and observe different pets in the classroom.

Animals, including humans (1AH)

- i) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Animals, including humans (2AH)

- i) notice that animals, including humans, have offspring which grow into adults.
- ii) find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- iii) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions

Autumn 2 – Seasonal Changes

Weather Art

In this block, talk about the four seasons and make a season collage together. Go outside to experience the wind and make a windsock, windmill and bottle wind spinner in the classroom.

Talk about the importance of the sun, design sun catchers to hang in the classroom and a sundial for the playground.

Then explore shadows using torches and make shadow theatre characters to use with DIY light boxes and OHPs

Seasonal Changes (1SC)

- i) observe changes across the four seasons.
- ii) observe and describe weather associated with the seasons and how day length varies.

Light (1L)

- i) observe and name a variety of sources of light, including electric lights, flames and the Sun.
- ii) associate shadows with a light source being blocked by something.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.

Spring 1 – Everyday Materials

Brilliant builders! Comparing Materials

Rise to the challenge of fixing a torn umbrella, explore different materials and answer the questions: how can we know that this material will not let the rain through? How can we test it? Go on further to investigate the absorbency and waterproofing of materials.

Everyday materials (1EM)

- v) distinguish between an object and the material from which it is made.
- vi) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- vii) describe the simple physical properties of a variety of everyday materials.
- viii) compare and group together a variety of everyday materials on the basis of their simple physical properties.

Uses of everyday materials (2EM)

- iii) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- iv) find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions
- vi) gathering and recording data to help in answering questions

Spring 2 – Plants

Art and Nature

In this block, investigate and sort materials according to where they came from. Learn all about those materials that come from plants. Create large pollen sculptures out of clay, find flowers outside in the playground and sketch them and then make a large model of the inside of a flower using junk modelling materials!

Enjoy being outside by doing bark and leaf rubbings and then do a piece of playground art, using cloths, chalk and found materials.

Plants (1P)

- iii) identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- iv) identify and describe the basic structure of a variety of common flowering plants, including trees.

Plants (2P)

- v) 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.
- vi) identify and name a variety of plants and animals in their habitats, including microhabitats.
- vii) describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions

Summer 1 – Use of Everyday Materials

Exploring changes

Observe a block of ice and record the changes. Devise an investigation to melt the ice quickly or slowly.

Then create puddles and measure how they change.

Take up the challenge of investigating the absorbency of fabrics and explore changes in wax through batik art and crayon making.

Everyday materials (1EM)

- ix)** distinguish between an object and the material from which it is made.
- x)** identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- xi)** describe the simple physical properties of a variety of everyday materials.
- xii)** compare and group together a variety of everyday materials on the basis of their simple physical properties.

Uses of everyday materials (2EM)

- v)** identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- vi)** find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions
- vi) gathering and recording data to help in answering questions

Summer 2 - Habitats

Habitats and Homes

In this block, make a playground allotment, plant edible plants and bird scaring sculptures.

Weed and tend to the allotment, visit a farm and play farms with the small world play.

In groups, design bug hotel, and build it together.

Living things and their habitats (2LvH)

- i) explore and compare the differences between things that are living, dead, and things that have never been alive.
- ii) 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.

Working scientifically (KS1 WS)

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.

Autumn 1 – Forces and Magnets (3FM)

Magnetic Fun and Games

Play and Learn (P & L) Toys make toys and games that are fun and great for learning. They have asked you to help them design and test some new products. These toys and games will work using forces and magnetism. If you accept the challenge you will need to brush up on your scientific knowledge and skills and there will be plenty of testing and investigating to be done. Your final challenge will be to design a new toy or game that works using magnetism.

Forces and Magnets

- i. compare how things move on different surfaces
- ii. notice that some forces need contact between two objects, but magnetic forces can act at a distance
- iii. observe how magnets attract or repel each other and attract some materials and not others
- iv. 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
- v. describe magnets as having two poles
- vi. predict whether two magnets will attract or repel each other, depending on which poles are facing

Working scientifically

- I. asking relevant questions and using different types of scientific enquiries to answer them
- II. setting up simple practical enquiries, comparative and fair tests
- III. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units,(not-using a range of equipment, including thermometers and data loggers)
- IV. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- V. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- VI. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- VII. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- VIII. identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings

Autumn 2 – Animals Including Humans (3AH)

Fit for Success

Teignford hockey team have not won a match all season and feel that it's time to turn things around if they want to win the league next year. Can you take on the challenge of coaching them to fitness? They need a whole pack of advice on diet, exercise and how to prevent injury not to mention positive team spirit and self belief!

Animals Including Humans

- I. 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
- II. Identify that humans and some other animals have skeletons and muscles for support, protection and movement

Working scientifically – all parts highlighted

- i. asking relevant questions and using different types of scientific enquiries to answer them
- ii. setting up simple practical enquiries, comparative and fair tests
- iii. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- iv. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- v. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- vi. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- vii. identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings

Spring 1 – Living things and their habitats (4LvH)

A World of Living Things

Our planet is full of beautiful plants and remarkable animals. It is an incredible world of living things, but what is special about something that is alive? Your task is to create an amazing interactive book that explains all about our incredible world of living things. Discover how living things are grouped according to their features. Create exciting pop-ups, spring-outs, lift up flaps and turning wheels which show the wonderfully diverse groups of plants and animals on our planet.

Living things and their habitats

- i. recognise that living things can be grouped in a variety of ways
- ii. explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Working Scientifically (LKS2)

- i. asking relevant questions and using different types of scientific enquiries to answer them
 - ii. **(not setting up simple practical enquiries, comparative and fair tests)**
 - iii. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, **(not including thermometers and data loggers)**
 - iv. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
 - v. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
 - vi. reporting on findings from enquiries, including oral and written explanations, displays or presentations **(not of results and conclusions)**
 - vii. **(not using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions)**
 - viii. identifying differences, similarities or changes related to simple scientific ideas and processes
- (not using straightforward scientific evidence to answer questions or to support their findings)**

Spring 2 – Plants (3P)

A Feast of Flowers Fruits and Seeds

Create a feast of flowers, fruits and seeds. Over the sessions, build up expertise on plant life cycles, understanding the importance of flowers, bees, fertilisation, and the huge variety of fruits and seeds. Know how each stage in the lifecycle can provide delicious, nutritious food and cook up some mouth-watering dishes to serve at your feast. But this will be a feast with a difference, each course will be accompanied by a fascinating presentation of facts and information about plant life cycles

Plants (Lifecycles)

- explore the part that flowers play in the life cycle of flowering plants

Working Scientifically (LKS2)

- i. asking relevant questions and using different types of scientific enquiries to answer them
- ii. setting up simple practical enquiries, comparative and fair tests
- iii. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, (not using a range of equipment, including thermometers and data loggers)
- iv. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- v. recording findings using simple scientific language, drawings, labelled diagrams,**(not keys, bar charts, and tables)**
- vi. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- vii. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- viii. identifying differences, similarities or changes related to simple scientific ideas and processes
- ix. using straightforward scientific evidence to answer questions or to support their findings

Summer 1 – States of Matter (4SM)

What's the Matter?

The Dartspring Science Museum is setting up an exciting new section for visitors which is all about States of Matter and they need your help. They need some good ideas to teach people the differences between solids, liquids and gases. Can you demonstrate what happens to matter when it is heated and cooled and how this happens in the local environment? The museum café wants to serve special themed foods and drinks and they need your help to develop this idea. Are you up to the challenge?

States of Matter (4SM)

- i) compare and group materials together, according to whether they are solids, liquids or gases
- ii) 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)
- iii) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Working Scientifically (LKS2)

- I. asking relevant questions and using different types of scientific enquiries to answer them
- II. setting up simple practical enquiries, comparative and fair tests
- III. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- IV. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- V. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- VI. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- VII. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- VIII. identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings

Summer 2 – Sound (4S)

Sounds Spectacular!

A new rhythm band called "Sounds Spectacular" is being set up. The band members want to make great music using rhythms and tunes made from everyday items. Dave, the leader of the band, needs a sound consultant to help him understand the scientific aspects involved, e.g. How will the audience hear the music? How can they change the volume or the pitch of the sounds? Dave hopes you will be able to help but it will mean setting up some investigations and getting to grips with some scientific research. Are you up to the challenge?

Sound

- i. identify how sounds are made, associating some of them with something vibrating
- ii. recognise that vibrations from sounds travel through a medium to the ear
- iii. find patterns between the pitch of a sound and features of the object that produced it
- iv. find patterns between the volume of a sound and the strength of the vibrations that produced it
- v. recognise that sounds get fainter as the distance from the sound source increases

Working Scientifically (LKS2)

- I. asking relevant questions and using different types of scientific enquiries to answer them
- II. setting up simple practical enquiries, comparative and fair tests
- III. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, (**not including thermometers**) and data loggers
- IV. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- V. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- VI. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- VII. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- VIII. identifying differences, similarities or changes related to simple scientific ideas and processes

using straightforward scientific evidence to answer questions or to support their findings.

Year 3 and Year 4 Cycle B

Autumn 1 – Rocks and Fossils (3R)

This Planet Rocks!

Some independent television programme makers want to make a documentary for children on rocks and fossils called This Planet Rocks! They would like children to present the show and be the rock experts. They have asked your class to help make some pilot programmes for them. Are you up to the challenge? You will need to brush up on your expertise on rocks, fossils and soils.

Rocks and Fossils

- i) compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- ii) describe in simple terms how fossils are formed when things that have lived are trapped within rock
- iii) recognise that soils are made from rocks and organic matter

Working scientifically

- IX. asking relevant questions and using different types of scientific enquiries to answer them
- X. setting up simple practical enquiries, comparative and fair tests
- XI. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, (not using a range of equipment, including thermometers and data loggers)
- XII. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- XIII. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- XIV. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- XV. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- XVI. identifying differences, similarities or changes related to simple scientific ideas and processes
- XVII. using straightforward scientific evidence to answer questions or to support their findings

Autumn 2 – Light (3L)

Shining the Light!

The Rainbow Theatre had a robbery. Some diamond earrings have been stolen during the dress rehearsal for the new play. There are 6 suspects to the crime and the police need your help to solve the mystery. There was a small audience for the rehearsal and they witnessed some strange events that led up to the robbery. Can you piece together the clues and solve the crime?

Light

- i) recognise that they need light in order to see things and that dark is the absence of light
- ii) notice that light is reflected from surfaces
- iii) recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- iv) recognise that shadows are formed when the light from a light source is blocked by an opaque object
- v) find patterns in the way that the size of shadows change

Working scientifically – all parts highlighted

- viii. asking relevant questions and using different types of scientific enquiries to answer them
- ix. setting up simple practical enquiries, comparative and fair tests

- x. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, (not including thermometers and data loggers)
 - xi. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
 - xii. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
 - xiii. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
 - xiv. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
 - xv. identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings

Spring 1 – Living things and their habitats (4LvH)

Habitat Helpers

The plants and creatures in our amazing world are in danger, but why? Their habitats are changing for lots of different reasons. It is your job to help, but how? Governments are trying to make changes but they can only do so much. To make a real difference, everyone needs to care and to make changes. It is your job to persuade them by staging your own Habitat Helpers Fair which will teach people about the problems and what they can do to help. Are you up for the challenge? You will need to become experts on a number of important Green Issues affecting local and worldwide habitats.

Living things and their habitats

iii. recognise that environments can change and that this can sometimes pose dangers to living things

Working Scientifically (LKS2)

- i. asking relevant questions and using different types of scientific enquiries to answer them
- ii. setting up simple practical enquiries, comparative and fair tests
- iii. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- iv. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- v. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- vi. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- vii. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- viii. identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings

Spring 2 – Plants (3P)

Greatly Green Growers

The members of the Greatly Green Horticultural Society (AKA The Greatly Green Growers) have been challenged to a growing competition by their rival town Croppingwell! The challenge is on to produce the heaviest marrow, the longest runner beans, the juiciest fruits and the biggest flowers! They need your help. Can you become their plant growing experts and find out through research and investigation, what plants need to grow as strong and healthy as possible?

Plants (Lifecycles)

- i) identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- ii) 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
- iii) investigate the way in which water is transported within plants

Working Scientifically (LKS2)

- x. asking relevant questions and using different types of scientific enquiries to answer them

- xi. setting up simple practical enquiries, comparative and fair tests
- xii. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- xiii. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- xiv. recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- xv. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- xvi. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- xvii. identifying differences, similarities or changes related to simple scientific ideas and processes
- xviii. using straightforward scientific evidence to answer questions or to support their findings

Summer 1 –Animals Including Humans (4AH)

The Circle of Life

Our amazing planet is teeming with life from the depths of the oceans to the highest mountains. But every living thing is dependent on other living things for its survival. Every animal needs to eat plants or other animals. Plants need rich soil to grow strong and healthy and soil is made rich for growing by the decomposing remains of plants and animals that were once alive. It is an endless circle of life. Your task is to share this amazing never ending story with an audience through dance, music and narration.

Animals Including Humans (4AH)

- i) describe the simple functions of the basic parts of the digestive system in humans
- ii) identify the different types of teeth in humans and their simple functions
- iii) construct and interpret a variety of food chains, identifying producers, predators and prey

Working Scientifically (LKS2)

- IX. asking relevant questions and using different types of scientific enquiries to answer them
- X. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- XI. recording findings using simple scientific language, drawings, labelled diagrams, **(not keys, bar charts, and tables)**
- XII. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- XIII. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- XIV. identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings

Summer 2 – Electricity (4E)

Electric Personalities

Create your own amazing electric powered person or robot to impress your friends and family. Design a face with exciting electrical components such as a nose that buzzes when you press it or eyes that light up at the flick of a switch! You could even design some electrical accessories like a revolving bowtie or hat! The possibilities are endless so let your imagination run riot! First you will need to brush up on your electrical knowledge and expertise so let's get started!

Electricity (4E)

- i) identify common appliances that run on electricity
- ii) construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- iii) 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
- iv) recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- v) recognise some common conductors and insulators, and associate metals with being good conductors

Working Scientifically (LKS2)

- IX. asking relevant questions and using different types of scientific enquiries to answer them
- X. setting up simple practical enquiries, comparative and fair tests

- XI.** making systematic and careful observations (**not where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers**)
- XII.** gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- XIII.** recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- XIV.** reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- XV.** using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- XVI.** identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings

Year 5 and Year 6 Cycle A

Autumn 1A – Living Things & their Habitats (5/6LvH)

Illustrating Life Cycles

You have been commissioned to create an inspirational and informative illustrated book on the theme of animal and plant life cycles. Develop your mastery of key art skills as you create accurate and eye catching illustrations that accurately tell the life cycle story of a range of nature’s wonders. Along the way hone your skills as a natural scientist and top off your work by ‘meeting’ David Attenborough, Jane Goodall and their natural scientist colleagues. Enter your final book into the ‘Excellence in Scientific Illustration’ awards.

Living things and their habitats

- i. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- ii. Describe the life process of reproduction in some plants and animals

Working scientifically

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- iv. Using test results to make predictions to set up further comparative and fair tests
- v. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. Identifying scientific evidence that has been used to support or refute ideas or arguments

Autumn 2A – Properties and changes of Materials (5/6PCMa)

Materials Consultants

You have been employed as a materials ‘agony aunt/uncle’ to help solve everyday issues caused by the amazing array of material properties. Do you know your thermal insulators from your thermal conductors? Can you find the best materials to keep one reader’s porridge hot for their commute to work, and the best bags for class 2’s snack sales? You will need to carry out an impressive array of tests to identify which materials are up to the job for a variety of reader needs.

Properties and Changes of Materials

- ii. Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal)
- iii. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

Working scientifically

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

- iii. Recording data and results of increasing complexity using scientific diagrams and labels, scatter graphs, bar and line graphs
- iv. Using test results to make predictions to set up further comparative and fair tests
- v. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. Identifying scientific evidence that has been used to support or refute ideas or arguments

Spring 1A – Animals (including humans) (5/6AH)

The Human Species

You have been approached to create an exhibition about the human species. Can you research and collate information on growth, development, puberty and old age, and present it in a sensitive and logical way that is suited to your audience? Create sculptures and sketches that not only reflect the complexity of the human body but also act as an accurate and informative presentation of the complex systems that help make us human. You have 6 weeks until the exhibition opens...

Animals (including humans)

- i. Describe the changes as humans develop to old age
- ii. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- iii. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- iv. describe the ways in which nutrients and water are transported within animals, including humans

Working scientifically

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Recording data and results of increasing complexity using scientific diagrams and labels, tables, scatter graphs, bar and line graphs
- iv. Using test results to make predictions to set up further comparative and fair tests
- v. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. Identifying scientific evidence that has been used to support or refute ideas or arguments

Spring 2A – Light (5/6L)

Theatre Lighting Technicians

A job opportunity has arisen at the National Theatre for a lighting technician and you have been asked to apply! You will need to put together a portfolio for the interview demonstrating that you have the skills and knowledge to put on a colourful and effects-driven show. You will need to make sure you have the technical know-how as well as a sound understanding of the science behind the behaviour of light.

Light

- i. Recognise that light appears to travel in straight lines
- ii. 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
- iii. 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
- iv. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Working scientifically

- i. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Record results using scientific diagrams and labels, tables, scatter graphs, bar and line graphs

- iv. Use test results to make predictions to set up further comparative and fair tests
- v. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. Identify scientific evidence that has been used to support or refute ideas or arguments

Summer 1A – Electricity (5/6E)

Electric Art

The National Sensory Art Association (NSAA) has asked you to create an electric art installation for a sensory garden exhibition. Take a lucky dip and find out your specific theme, while following the brief to use motors, switches, bulbs and buzzers to make your art a stand-out choice for display.

Electricity

- i. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- ii. 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
- iii. Use recognised symbols when representing a simple circuit in a diagram

Working scientifically

- i. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Record results using scientific diagrams and labels, tables, scatter graphs, bar and line graphs
- iv. Use test results to make predictions to set up further comparative and fair tests
- v. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. Identify scientific evidence that has been used to support or refute ideas or arguments

Summer 2A – Revision Block (5/6E)

Medical Manoeuvres

Use your knowledge from across the year to embrace a series of medical challenges from the Wellford Bury Hospital and see if you can help improve people's lives and the work of our health service. Explore possible approaches to help people recovering from or living with medical conditions, and investigate how understanding insect life cycles can help control certain diseases. Investigate and select the right materials for certain medical equipment as well as designing electrical and lighting systems to help with medical procedures. Test out your computing skills along the way and create your own blog to record your experiences

Revision Block

- 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
- 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 comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Describe the changes as humans develop to old age
- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- Describe the ways in which nutrients and water are transported within animals, including humans
- 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

- 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

Working scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Record results using scientific diagrams and labels, tables, scatter graphs, bar and line graphs
- Use test results to make predictions to set up further comparative and fair tests
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identify scientific evidence that has been used to support or refute ideas or arguments

Year 5 and Year 6 Cycle B

Autumn 1B – Properties and changes of Materials (5/6PCMb)

Special Effects Materials

The British Film Institute (BFI) directors need a new team of special effects technicians for a series of upcoming movies. You will need to explore a range of materials to create the desired special effects and compile a technician's guide.

Properties and Changes of Materials

- Compare and group together everyday materials on the basis of their properties, including their solubility 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
- Demonstrate that dissolving, mixing and changes of state are reversible changes
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

Working scientifically

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Using test results to make predictions to set up further comparative and fair tests
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

Identifying scientific evidence that has been used to support or refute ideas or arguments

Autumn 2B – Earth and Space (5/6ES)

Space!

Galileo Galilei needs your help at The Roman Inquisition: he needs to prove that the Earth moves round the sun; that the moon moves around the Earth; and that the seasons and day & night are all a consequence of these movements. He needs you to provide experimental evidence, not just current astrological thinking... and he is running out of time!

Earth and space

- 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

- iii. Describe the Sun, Earth and Moon as approximately spherical bodies
- iv. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Working scientifically

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Recording data and results of increasing complexity using scientific diagrams and labels, tables, scatter graphs, bar and line graphs
- iv. Using test results to make predictions to set up further comparative and fair tests
- v. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. Identifying scientific evidence that has been used to support or refute ideas or arguments

Spring 1B – Forces (5/6F)

Welcome to Force-Land

A new theme park is in the planning process and you have been selected to join the development team. Explore a range of forces and mechanisms, and see if you can incorporate them into a number of theme park rides.

Forces

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

Working scientifically

- i. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Record results using scientific diagrams and labels
- iv. Use test results to make predictions to set up further comparative and fair tests
- v. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

Spring 2B – Living Things and their Habitats (5/6LvH)

The Classification Code

Explore the world of classification and release the next part of your classification code with each new challenge. As you become more expert you will move closer to cracking the code and discovering an interesting fact from the world of classification. Meet Linnaeus along the way and identify a range of living things right on your back door as well as exploring creatures further afield. Your challenge culminates in the design of your own new creatures that fit within the classification system.

Living Things and their Habitats

- i. Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- ii. Give reasons for classifying plants and animals based on specific characteristics

Working scientifically

- i. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Record results using scientific diagrams and labels
- iii. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- iv. Identify scientific evidence that has been used to support or refute ideas or arguments

Summer 1B – Evolution and Inheritance (5/6EI)

Survival of the Fittest

Take part in a series of challenges and explore which living things have survived in the game of life, evolving to keep one step ahead of the game. You will need to have your evolutionary wits about you and a keen eye for the survival of the fittest. Meet some evolutionary revolutionaries and use their approach to write your own Just So story.

Inheritance

- iii. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- iv. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- v. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Working scientifically

- i. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- ii. Identifying scientific evidence that has been used to support or refute ideas or arguments

Summer 2B – Revision Block (5/6RB)

Sensational Science

Explore the more unexpected side to science and see how some things challenge our scientific expectations. Investigate some mind-blowing reactions, sensational space behaviour, fickle forces, crazy creature classifications, and some extraordinary evolution antics. Understand better how the scientific community develops theories and how some science debates will continue for a while to come.

Revision Block

- i. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- ii. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- iii. Demonstrate that dissolving, mixing and changes of state are reversible changes
- iv. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda
- v. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- vi. Describe the movement of the Moon relative to the Earth
- vii. Describe the Sun, Earth and Moon as approximately spherical bodies
- viii. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky
- ix. Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- x. Give reasons for classifying plants and animals based on specific characteristics
- xi. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- xii. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- xiii. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
- xiv. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- xv. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- xvi. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Working scientifically

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- iv. Using test results to make predictions to set up further comparative and fair tests

- v. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- vi. identifying scientific evidence that has been used to support or refute ideas or arguments