Science Policy

Our Vision

We want Virginia Primary School to be a community of happy, confident, motivated lifelong learners. We want our pupils to be successful citizens who value themselves and each other. Therefore, we are continually striving to ensure that we nurture, challenge and enable each and every one to be the very best they can be in all areas of school life.

Rights Respecting School

We are a Right Respecting School and this policy supports the following articles from the United Nations on the Convention on the Rights of a Child:

- Article 13: freedom of expression
- Article 14: freedom of thought, belief and religion
- Article 23: pupils with a disability
- Article 28: right to an education
- Article 29: goals of education

Approved by:		**Date:**
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Vision

We want our pupils to explore the world around them with curiosity and excitement, asking questions and making predictions about how things work and why things happen. We want to ensure that they understand the importance of the natural and physical world and develop a respect for all living things.
We want our pupils to understand the key scientific concepts, facts and processes appropriate for their stage of learning, and be able to build on this knowledge through practical enquiry and scientific investigation. We want them to be able to analyse and explain their findings using scientific language and vocabulary with confidence. We also want them to appreciate the role that science has played in shaping the way we live today, and the valuable contributions made by a diverse range of people, cultures and communities.

Aims

To ensure this vision is met, we aim to deliver a science curriculum that:

- Stimulates and excites curiosity about the world around us
- Develops a solid understanding of core concepts and scientific knowledge
- Builds confidence in using scientific knowledge to answer questions
- Offers hands-on practical experiences and activities that develop specific scientific skills
- Ensures that all pupils make progress in their scientific understanding and skills
- Places science in a real-world, diverse and cross-curricular context

INTENT – WHAT WE WANT TO TEACH

Curriculum Content

Early Years Framework

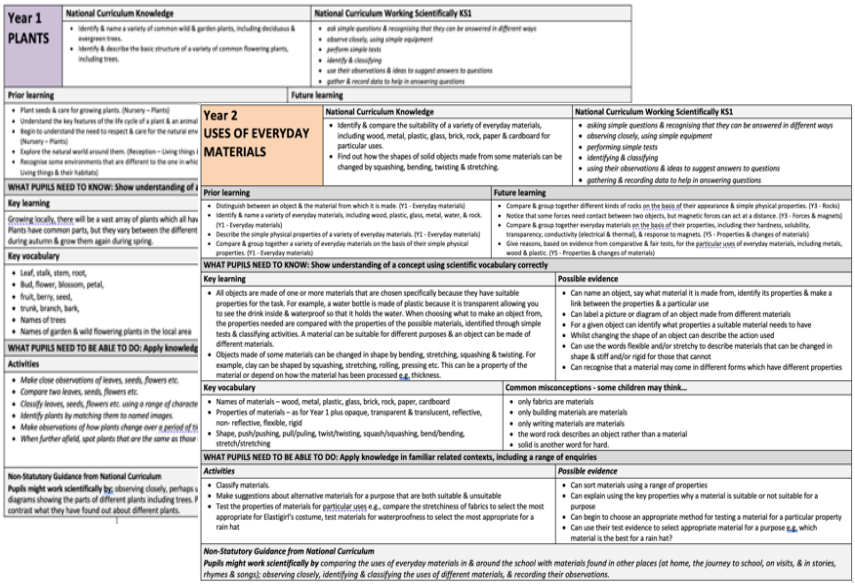
Pupils in the EYFS follow the EFYS Framework where Scientific knowledge and skills are covered in the Understanding the World area of learning. Some aspects of the Communication and Language, Literacy and Mathematics areas of learning will also support learning in this area.
We ensure that relevant learning in the EYFS is taken into account as pupils move into Year 1.

National Curriculum

In Key stage 1 and 2 we follow the National Curriculum for Science 2014 and ensure that all statutory requirements are met at each Phase/Key Stage and in each year group.

Knowledge and Understanding

The Science National Curriculum contains a range of concepts, knowledge and understanding across the three areas of science: Life and Living Things (Biology); The Physical World (Physics) and Materials and Their Properties (Chemistry). We build learning around these strands across all year groups to ensure progression.



Year 1 PLANTS

National Curriculum Knowledge
- Identify & name a variety of common wild & garden plants, including deciduous & evergreen trees.
- Identify & describe the basic structure of a variety of common flowering plants, including trees.

National Curriculum Working Scientifically KS1
- *ask simple questions & recognising that they can be answered in different ways*
- *observe closely, using simple equipment*
- *perform simple tests*
- *identify & classifying*
- *use their observations & ideas to suggest answers to questions*
- *gather & record data to help in answering questions*

Prior learning
- Plant seeds & care for growing plants. (Nursery – Plants)
- Understand the key features of the life cycle of a plant & an animal
- Begin to understand the need to respect & care for the natural env (Nursery – Plants)
- Explore the natural world around them. (Reception – Living things
- Recognise some environments that are different to the one in whic Living things & their habitats)

Future learning

WHAT PUPILS NEED TO KNOW: Show understanding of a

Key learning

Growing locally, there will be a vast array of plants which all hav Plants have common parts, but they vary between the different during autumn & grow them again during spring.

Key vocabulary
- Leaf, stalk, stem, root,
- Bud, flower, blossom, petal,
- fruit, berry, seed,
- trunk, branch, bark,
- Names of trees
- Names of garden & wild flowering plants in the local area

WHAT PUPILS NEED TO BE ABLE TO DO: Apply knowledg

Activities
- *Make close observations of leaves, seeds, flowers etc.*
- *Compare two leaves, seeds, flowers etc.*
- *Classify leaves, seeds, flowers etc. using a range of characte*
- *Identify plants by matching them to named images.*
- *Make observations of how plants change over a period of ti*
- *When further afield, spot plants that are the same as those*

Non-Statutory Guidance from National Curriculum

Pupils might work scientifically by: observing closely, perhaps u diagrams showing the parts of different plants including trees. P contrast what they have found out about different plants.

Year 2 USES OF EVERYDAY MATERIALS

National Curriculum Knowledge
- Identify & compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper & cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting & stretching.

National Curriculum Working Scientifically KS1
- *asking simple questions & recognising that they can be answered in different ways*
- *observing closely, using simple equipment*
- *performing simple tests*
- *identifying & classifying*
- *using their observations & ideas to suggest answers to questions*
- *gathering & recording data to help in answering questions*

Prior learning
- Distinguish between an object & the material from which it is made. (Y1 - Everyday materials)
- Identify & name a variety of everyday materials, including wood, plastic, glass, metal, water, & rock. (Y1 - Everyday materials)
- Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)
- Compare & group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)

Future learning
- Compare & group together different kinds of rocks on the basis of their appearance & simple physical properties. (Y3 - Rocks)
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces & magnets)
- Compare & group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical & thermal), & response to magnets. (Y5 - Properties & changes of materials)
- Give reasons, based on evidence from comparative & fair tests, for the particular uses of everyday materials, including metals, wood & plastic. (Y5 - Properties & changes of materials)

WHAT PUPILS NEED TO KNOW: Show understanding of a concept using scientific vocabulary correctly

Key learning
- All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside & waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests & classifying activities. A material can be suitable for different purposes & an object can be made of different materials.
- Objects made of some materials can be changed in shape by bending, stretching, squashing & twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.

Possible evidence
- Can name an object, say what material it is made from, identify its properties & make a link between the properties & a particular use
- Can label a picture or diagram of an object made from different materials
- For a given object can identify what properties a suitable material needs to have
- Whilst changing the shape of an object can describe the action used
- Can use the words flexible and/or stretchy to describe materials that can be changed in shape & stiff and/or rigid for those that cannot
- Can recognise that a material may come in different forms which have different properties

Key vocabulary
- Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard
- Properties of materials – as for Year 1 plus opaque, transparent & translucent, reflective, non- reflective, flexible, rigid
- Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching

Common misconceptions - some children may think…
- only fabrics are materials
- only building materials are materials
- only writing materials are materials
- the word rock describes an object rather than a material
- solid is another word for hard.

WHAT PUPILS NEED TO BE ABLE TO DO: Apply knowledge in familiar related contexts, including a range of enquiries

Activities
- Classify materials.
- Make suggestions about alternative materials for a purpose that are both suitable & unsuitable
- Test the properties of materials for particular uses e.g., compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for waterproofness to select the most appropriate for a rain hat

Possible evidence
- Can sort materials using a range of properties
- Can explain using the key properties why a material is suitable or not suitable for a purpose
- Can begin to choose an appropriate method for testing a material for a particular property
- Can use their test evidence to select appropriate material for a purpose e.g. which material is the best for a rain hat?

Non-Statutory Guidance from National Curriculum

Pupils might work scientifically by *comparing the uses of everyday materials in & around the school with materials found in other places (at home, the journey to school, on visits, & in stories, rhymes & songs); observing closely, identifying & classifying the uses of different materials, & recording their observations.*

We use the **ASE PLAN Knowledge Grids** to focus on the specific knowledge and skills that need to be learned in each Science Unit.
This ensures that pupils are taught the correct science content at the right stage of their school journey.

Scientific Skills

We ensure that pupils learn scientific skills as part of scientific investigations and practical activities. These skills are always linked to specific knowledge and concepts.

Vocabulary

We use the key vocabulary from the ASE PLAN Knowledge Grids to ensure progression Withing the three main themes across all year groups. This vocabulary is built into the more detailed medium term plans and staff will incorporate it into lesson resources and displays. For further details see the **Vocabulary Progression Grid.**

Curriculum Overview

The science objectives laid out in the statutory National Curriculum have been mapped across each year group to ensure progression within the different scientific knowledge strands

Thematic links

Some Science units are matched to other class topics and themes but only where links are strong and will enhance learning.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	SoS: Who Am I?	Hamilton	Hamilton	Hamilton	Hamilton	Hamilton
	Animals inc Humans Y1: Human Structures Labels, Senses	**Everyday Materials Y1:** Object/material distinction Identify & name everyday materials	**Animals inc Humans Y1:** Identify/name variety of animals Describe and compare the structure of different animals	**Everyday Materials Y1:** Describe properties of everyday materials & compare and group based on properties	**Animals inc Humans Y1:** Identify and name variety of herbivores, carnivores, and omnivores	**Plants Y1:** Identify and name plants & trees Describe basic structure of common plants and trees
	Seasonal Changes - link to Plants					
Year 2	Hamilton: Animals inc Humans	SoS: Materials Monster	Hamilton Animals inc Humans	SoS: Move it	Hamilton Living Things/Habitats	Hamilton Plants
	Animals inc Humans Y2: Animal Growth and Life Cycles	**Everyday Materials Y2:** Suitability of various everyday materials for their uses	**Animals inc Humans Y2:** Human basic needs, growth, healthy eating, exercise	**Everyday Materials Y2:** Changing shape of some materials by squashing, bending, twisting & stretching	**Living Things Habitats Y2:** Alive/dead/never alive Animal and plant habitats Food chains	**Plants Y2:** Seeds/bulbs: plant growth: plant growth needs - water/light/temp,
Year 3	SoS: Opposites Attract	SoS: Earth and Rocks	SoS: Food and Our Bodies		SoS: HDY Garden Grow?	SoS: Mirror Mirror
	Forces and Magnets Y3: Magnetism	**Rocks Y3:** Rocks and Fossils	**Animals in Humans Y3:** Nutrition, muscles, skeleton		**Plants Y3:** Plant Lifecycle, growth requirements, structure	**Light Y3:** Light, danger of sunlight, shadows, reflections
Year 4	SoS: Power it up	SoS: Teeth and Eating	SoS: Looking at States		SoS: What's That Sound?	SoS: Living things
	Electricity Y4: Electricity - Circuits appliances	**Animals inc Humans Y4:** Digestion, teeth, food chains	**States of Matter Y4:** solid, liquid, gas, water cycle,		**Sound Y4:** Sound, vibration, volume, pitch	**Living Things Habitats Y4:** Group, classify, identify living things, local environments
Year 5	SoS: Circle of Life	SoS: Growing Up Growing Old (PHSE) SoS: Let's Get Moving	SoS: Material World		SoS: Let's Get Moving	SoS: Out of This World
	Living Things and Habitats Y5: Animal and plant life cycles	**Animals inc Humans Y5:** Humans changes to old age **Forces Y5:** Levers gears pulleys, Friction/moving surfaces	**Properties and Changes of Materials Y5:** properties and everyday uses. reversible changes - mixing, dissolving, separating, new materials		**Forces Y5:** Gravity, Water/Air Resistance	**Earth Space Y5:** Sun, Earth Moon Day and Night
Year 6	SoS: Classifying Critters	SoS: We Are Evolving	SoS: Let It Shine	SoS: Electrifying	SoS Staying Alive	
	Living Things and Habitats Y6: Classification of living things	**Evolution Inheritance Y6:** Fossils, Inheritance, Evolution	**Light Y6:** Human Eye Light and Shadows	**Electricity Y6:** Electrical circuit components	**Animals inc Humans Y6:** Human heart and circulation, exercise, diet, nutrition, health	

IMPLEMENTATION – HOW WE ARE GOING TO TEACH IT?

Equal Opportunities and Inclusion

We ensure that all pupils have access to the science curriculum by using a range of strategies and approaches including:

- Carefully planned and targeted use of additional adult support
- Differentiated resources, including writing frames and scaffolds, where necessary
- Use of paired and group work to support pupils to reach greater depth

We ensure that learning in science and technology is inclusive and that it:

- Supports positive attitudes to scientific endeavour in different cultures
- Provides good role models and resources that emphasise equality, diversity and inclusion
- Reflects the achievements of women in STEM subjects and encourages girls to take part
- Shows how science and technology plays an important role in the developing world

Science Scheme of Work

The school Science Lead has developed a bespoke scheme of work with detailed lesson plans and resources for each year group. A science unit is taught either half termly or termly.
The scheme of work covers the statutory Science National Curriculum for all year groups and also reflects the school ethos and values.

Resources

We provide a range of appropriate practical and hands-on resources and equipment for each science unit, ensuring that there is enough to support meaningful investigations in pairs, small groups and whole class demonstrations. Equipment is checked and reviewed each year and replaces/updated if necessary.
We use several reputable third-party teaching and learning resources, lesson plans and presentations. These sources have been evaluated by the Science Lead and embedded into medium term plans to ensure teaching materials are appropriate and of consistent quality.

Health and Safety

We ensure that all investigations are safe and appropriate, using the *CLEAPPS Model Health and Safety Policy* for Science as guidance. For more details see the *Health and Safety Policy*

Planning

Teachers start with a detailed medium-term overview of science lessons for each half term topic that has been prepared by the Science Lead. They then create their own teaching slides using the suggested resources.

Learning Objectives

National Curriculum knowledge objectives are noted, and the key scientific enquiry approaches and skills for each session are identified. These are combined to create two learning objectives, one based around scientific enquiry skills (We are learning to…) and one based on scientific knowledge (We are learning that…)

Resources

Resources are signposted, including activity sheets, slide presentations, videos, books and other materials. Key questions and vocabulary are also provided. Expected pupil outcomes are listed to focus teaching.

Year 2 Science Planning Overview – Food, Exercise and Hygiene

Autumn 2	Week/Session 1	Week/Session 2	Week/Session 3	Week/Session 4	Week/Session 5	Week/Session 6
Science Topic	**Animal Growth and offspring**	**Animals Including Humans** Food	**Animals Including Humans** Food	**Animals Including Humans** Food	**Animals Including Humans** Exercise	**Animals Including Humans** Hygiene
NC Knowledge	***Notice that animals, including humans, have offspring which grow into adults***	***Describe the importance for humans of eating the right amounts of different types of food.***	***Describe the importance for humans of eating the right amounts of different types of food.***	***Describe the importance for humans of eating the right amounts of different types of food***	***Describe the importance for humans of exercise.***	***Describe the importance for humans of hygiene.***
*Working Scientifically **Approaches***	• Pattern Seeking • Identify, group, classify • Problem solving • Comparative & fair testing • Research • Observation over time	• Pattern Seeking • Identify, group, classify • Problem solving • Comparative & fair testing • Research • Observation over time	• Pattern Seeking • Identify, group, classify • Problem solving • Comparative & fair testing • Research • Observation over time	• Pattern Seeking • Identify, group, classify • Problem solving • Comparative & fair testing • Research • Observation over time	• Pattern Seeking • Identify, group, classify • Problem solving • Comparative & fair testing • Research • Observation over time	• Pattern Seeking • Identify, group, classify • Problem solving • Comparative & fair testing • Research • Observation over time
*Working Scientifically **Skills***	• Ask questions • Make predictions • Set up tests & comparisons • Observe & measure • Record data • Interpret & communicate results • Evaluate	• Ask questions • Make predictions • Set up tests & comparisons • Observe & measure • Record data • Interpret & communicate results • Evaluate	• Ask questions • Make predictions • Set up tests & comparisons • Observe & measure • Record data • Interpret & communicate results • Evaluate	• Ask questions • Make predictions • Set up tests & comparisons • Observe & measure • Record data • Interpret & communicate results • Evaluate	• Ask questions • Make predictions • Set up tests & comparisons • Observe & measure • Record data • Interpret & communicate results • Evaluate	• Ask questions • Make predictions • Set up tests & comparisons • Observe & measure • Record data • Interpret & communicate results • Evaluate
Scheme of Work Units	**VPS Planning** **Animals and their offspring**	**VPS Planning** **Identifying different types of food**	**VPS Planning** **Food groups**	**VPS Planning** **Balanced diet**	**VPS Planning** **Importance of exercise and sleep**	**VPS Planning** **Importance of hygiene**
Resources	***BBC Bitesize:*** *How do animals grow?* https://tinyurl.com/5n7s56u7 ***CGP****: Animal Offspring Slides, Match the Animal Offspring sheet, Animal Offspring Bingo, Animal Offspring Sentences* *Plastic models of animals/offspring – EYFS?*	***BBC Bitesize: Being Healthy:*** https://tinyurl.com/4bh5wu4z ***Plastic food set,*** *Images from the* ***Food a Fact of Life pack,*** *Current* ***school dinner menu*** ***Healthy and Unhealthy sorting sheet*** *images of familiar* ***community food items***	***Healthy Lunchbox Memory Game*** ***Food sorting cards and shopping bags*** ***Healthy Eating CGP*** *adapted slides* ***Food a Fact of Life pack*** *food image and cut and stick sorting resources* ***Simple Food Groups Poster***	***Purple Mash activities:*** ***Simple City – Café activity*** ***Art – Paint Projects –*** *Plate, Jacket Potato, Bread Roll, Fruit Bowl, Supermarket Shelves*	***BBC Bitesize: Being Healthy:*** https://tinyurl.com/4bh5wu4z ***CGP Slide presentations:*** ***Why is Exercise important?*** ***Let's Get Moving*** ***Healthy Living, Sleep, Exercise & Hygiene***	***BBC Bitesize: Being Healthy:*** https://tinyurl.com/4bh5wu4z ***CGP Lets keep Things Clean slides*** ***CGP Hand and Food Hygiene sheet*** ***CGP Stop The Spread Activities*** ***Twinkl Hand Wash poster, Pass the Germ Game*** ***NHS How to Wash Your Hands Song video:*** https://www.youtube.com/watch?v=S9VjeIWLnEg
LO: We are learning to:	• Ask scientific questions about animals • Find information from text & images	• Identify different types of food	• Sort and group different types of food • Explain our sorting choices	• Create our own pictures to show a balanced heathy meal	• Observe and record what happens when we try out different types of exercise	• Compare different ways of washing our hands
LO: We will learn that:	• Animals have babies that don't always look like the adults	• Some foods are healthy and others are unhealthy	• Different foods belong in special groups depending on what type they are	• It is important to eat the right amounts of different types of food to stay healthy	• Being active and getting some exercise each day helps us stay healthy	• It is important to wash our hands and keep clean to stay healthy
Key Questions	• Do baby animals look like their parents? • Do all animals have live babies? • Which animals do you know that lay eggs? • What does hatching mean?	• Why do animals and humans need food? • What is the name of this food? • Have you ever eaten this food? • Is this food healthy or unhealthy?	• How many food groups are there? • What group does rice belong to? • Is ice cream a healthy food? • What types of food should we eat lots of?	• What does a balanced diet mean? • Which food groups should we only eat a little amount of in our diet? • What foods are on your healthy plate?	• Why do humans need to get regular exercise? • What parts of our body do we use when we run/walk/talk/sing/read etc?	• Why do we need to wash our hands? • What is the best way to make sure our hands are clean? •
Vocabulary	• Animal, baby, young, offspring, adult, live baby, egg, hatch, change, grow	• food, menu, lunch, recipe, list, healthy, unhealthy, names of different food types	• sugar, fat, energy, fruit, vegetables, starchy, proteins, dairy, oil, salt, balance	• balance, diet, food groups, amount, digital, drag and drop, print,	• exercise, running, breath, diary, healthy, fit, lungs, heart, test, compare	• hygiene, clean, dirty, invisible, germs, disease, illness, wash, soap,
Lesson Notes (include any changes to the SoW planning, differentiation & SEND, use of adults, resources etc)	• Revise work on human growth/change • Look at CGP Animal offspring slides together and have printed cards that match the images on screen on tables for children to sort, organise and arrange. • Add in small world animals and offspring. Encourage children to sort and group the images and models, and to explain why. Then ask them to sort into adult/baby, or lay eggs /live babies • Play the CGP Animal Bingo Games on tables • Look at Match Animal to Offspring posters Complete CGP Adult Offspring Match sheet	**Identifying food** • Look at pictures of different foods on whiteboard together and identify them • Pupils can tick each food off on their own printed "bingo card" • Provide picture cards, play food items, empty packets etc for children to explore • Ask children to name the foods and say if they have ever eaten this food **School lunch menu** • Look at a small section of the current school dinner menu list together and identify the meals and the foods used to make them • children annotate their own printed sheet with food names and a smiley face • Match teacher-created shopping lists with different school lunches **Healthy and Unhealthy** • Children work together on tables to sort pictures/play-food into healthy and unhealthy – provide baskets to sort into • Use the Twinkl Healthy/Unhealthy sorting sheet – cut and stick	**Simple Food Groups** • Introduce simple food groups - no need to use scientific terms for groups. • Don't use the Eatwell plate -use the **simplified illustration** in the Resources folder (NOT food pyramid as this is no longer up to date UK advice) • Use food photos/plastic food and sort into the groups on the poster – provide a large A3 laminated sheet for each table/pair **Carousel activities** • Split class into three groups – two working with an adult and one independently **1. Sorting food** • Use **Food sorting cards and shopping bags** to sort and group different foods into the right place **2. Cut and Stick sorting** • Consolidate with an appropriate **cut and stick activity** – choose from selection on Resources Folder **3. Healthy Lunchbox Game** • Play the Healthy Lunchbox memory Game	**Balanced Diet** • Review understanding of food groups, and importance of balanced diet. **ONLINE ACTIVITIES** – Chromebooks in pairs or half the class individually and the other half cutting and sticking from last sessions activities **Purple Mash Simple City – Café** • Use the Café scene to drag and drop food items to create a healthy meal – contrast with an unhealthy one – if possible print and stick into books **Purple Mash Subjects – Art - Paint Projects - Food** • Choose the Plate activity and create a healthy food plaint using the pen tools • Extend by exploring other heathy paint project options – Jacket Potato, Bread Roll, Fruit bowl, Super Market Shelves etc • Save and print and stick into books, or make a note in books that the digital version exists • Share some examples with the class.	**Types of activity** • Discuss different types of activities: sleeping, walking, running, playing football, cycling, swimming, watching TV, reading, writing, etc • make a class list and sort into two: lots of physical movement/not much movement • Explain that activities where we are more physically active are called **exercise** • **Use CGP slide PPTs to support** • Avoid judgment about not always being physically active – we need a **balance** **Before and after exercise** • Ask "What happens to our breath after we run?" Note predictions – we breath faster… • Carry out a simple test – run on the spot for 1 min – use a timer • Record what happens to their breath in a simple table - use a tick list with things to choose from eg faster, slower, the same • Discuss results together as a class **Importance of getting enough sleep** • Discuss the importance of getting enough sleep - to help our bodies recover from our activities – use **CGP Slides to support**	**What is hygiene?** • **Use the CGP Lets Keep things Clean slides** to introduce the idea of hygiene – meaning keeping ourselves and things we use clean **Handwashing** • Watch the **NHS How to Wash Your Hands song Video** - after watching it through once then follow along – practice, learn the song. • Look at the handwashing steps on the **CGP Hand Wash poster** – use it as a cut and stick sequencing activity **Handwashing Investigation** • Use one or more of the CGP Stop the Spread activities (avoid the glitter – use paint instead) • Describe the activity and ask for questions and predictions – use the Question Spinner • Questions might include: "Does using soap make handwashing better at getting our hands clean? "Is washing for longer better? • Carry out the investigations and record the results either in small groups or whole class • Look at the results together and discuss what they have found out – handwashing with soap is better than without, handwashing for a long time is better than a short time etc
Pupil Outcomes What will we see in books?	• Completed CGP Adult Offspring Match sheet • Challenge: Complete CGP Animal Offspring Sentences sheet	• Annotated copy of school lunch menu items • Completed food bingo cards with labels • Completed Healthy/Unhealthy sorting sheet	• Completed Food a Fact of Life cut and stick activities – including Eatwell Plate • Annotated photos of sorting activities and games	• Printed examples of digital painting and art activities	• List of different activities in two groups • Completed running test table	• Handwashing cut and stick sequencing • Printed results sheet • Simple explanation – completed with drawings, gap fill words or simple questions

Learning and Teaching

Characteristics of good science teaching

Good science teaching is varied, with teaching strategies, planned outcomes and delivery depending on what the pupils are learning. Teaching strategies might include:

- Concept mapping to activate prior knowledge and explore misconceptions
- Whole class teaching of new concepts and knowledge 'from the front'
- Using videos and images to support learning
- Teacher modelling and scaffolding of recording methods and scientific writing genres
- Paired discussion to consolidate teaching points
- Group discussions to support prediction and analysis of findings
- Focused practical work in small groups to develop measurement, observation and recording skills
- Open ended practical exploration in groups to encourage scientific questioning and hypothesising
- Research and information gathering sessions using books and digital resources
- Presentations from pupils to their peers explaining their findings
- Extended writing to develop scientific ideas and reach conclusions

Timetabling

Science is a core subject alongside English and Maths, and we feel it is important to make sure that there is enough teaching and learning time set aside to cover the Science curriculum in depth. To this end we have allocated **one morning session each week for Science for all year groups** either before or after morning break.

Science Books

Each pupil has a science book for recording their learning outcomes. In KS1 books have plain and lined pages, in KS2 lined pages only. Any drawings or diagrams will be done on plain paper and stuck into books. Photos of activities and investigations are always annotated by pupils and not included just as 'evidence'.

Classroom Displays and Working Walls

Displays in the classroom and around the school will support learning and also reflect the school's aims and vision for Science learning.

Cross-curricular links

Links with English

There is always a focus on **key vocabulary and scientific language**, particularly when starting a new topic, and pupils are encouraged to learn and remember these words.
Scientific writing will include description, explanation, information reports (including comparisons) and discussion. These types of writing are scaffolded using a range of writing frames, template and models until pupils are confident to use them independently. Pupils are also taught how to use evidence to formulate a conclusion as part of their scientific investigations and research.

Links with Maths

There are rich opportunities to link maths with science, particularly in the areas of data handling/statistics and measurement. Teachers plan for these links, ensuring that pupils are secure in the mathematical concepts and skills before using them in a scientific context

Use of ICT

ICT can be an invaluable tool for scientists, and there are many useful resources that will add a new dimension to many areas of science. These include:

- Data Logging equipment – for measurement and recording of light, sound and temperature levels
- Digital microscopes – the magnified image can be shown on the lass whiteboard
- Digital photography – invaluable to record a science investigation and stimulate follow-up writing
- Digital video – useful for recording a process that might be hard to see in detail or that happen quickly

IMPACT – HOW WE KNOW PUPILS ARE LEARNING

Marking

We follow the general *School Marking Policy* for science

- Marking includes both content/knowledge and scientific enquiry skills
- Attention is paid to possible misconceptions and opportunities for self/adult correction identified and included in comments written in the pupil's book

Assessment

We assess pupil learning and attainment in a variety of ways

Scientific Knowledge quizzes

Cognitive Science tells us that knowledge retention can be supported by asking pupils to recall their learning sometime after the topic has been taught. To this end we use knowledge quizzes at the end of Science units, and also after some time has passed. These quizzes are delivered using Google classroom.
In KS1 the quizzes are delivered as a whole class or in small groups with an adult.
In KS2 the quizzes are delivered individually to pupils.
The quiz results can be viewed immediately, and common misconceptions or misunderstandings corrected,

Pupil Voice Interviews

The Science Lead meet with pupils form each year group twice during the school year and asked questions about their learning. Pupils are encouraged to recall information, and also to use their Science books as a reference source to trigger recall.
Class teachers are present at these meetings which provide them with a valuable insight into pupil's understanding of the science topics covered and their ability to describe, explain and reflect on their science learning. It also allows teachers to assess their use of scientific vocabulary.

Pupil Self-Assessment

There will be opportunities for pupils to reflect on their learning in discussion with the teacher and their peers, and in written self-assessment statements in their Science books.

Formative Assessment and Marking

Science is assessed at the point of learning using the school's assessment and marking procedures. See the *Assessment Policy* for more information