Whitley Abbey Primary School

Hand in hand we learn

Science Curriculum

Curriculum Drivers			
Possibilities and Citizenship	**Reading and Oracy**	**Health and Wellbeing**	**Celebrating Diversity**
Our curriculum is designed to promote aspirations by preparing children for a changing world by making links between their learning and careers and opportunities in adult life. The curriculum enables children to make connections between what is learnt in school and open-up possibilities for them in later life. Teachers support children to be good citizens through the development of British Values and the core learning values of; Commitment, Opportunity, Respect and Excellence. .	Our curriculum is carefully designed to meet the needs of the children we serve, placing strong emphasis on the development of oracy skills and fluency in reading. At Whitley Abbey, we recognise that strong oracy underpins effective communication, enabling children to express themselves clearly and to understand others with confidence. Reading remains a cornerstone of our curriculum, supporting pupils in developing the independent learning skills they will need to thrive in later life.	Our curriculum is designed to promote children's health, wellbeing and resilience through the promotion of Whitley Character Values, friendship, kindness, courage, resilience, gratitude and honesty. We want our children to make good choices about their own health and wellbeing. Research suggested that better emotional wellbeing is associated with higher achievement in primary school. When children feel safe they are able to better access learning in the classroom.	Our curriculum is designed to celebrate diversity. This means understanding that each individual is unique and recognising and celebrating our individual differences. The concept of diversity encompasses community, acceptance and respect. We foster the exploration of these differences in a safe, positive, and nurturing environment. We believe that by practicing mutual respect for qualities and experiences that are different from our own we build alliances across differences so that we can work together to eradicate all forms of discrimination.

Intent

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. By building a key foundation of knowledge and conceptual understanding pupils will develop their understanding of the nature, processes and methods of science through different types of scientific enquiries. This will enable them to answer scientific questions about the world around them, developing a sense of excitement and curiosity of natural phenomena, as well as a love of learning.

At Whitley Abbey Primary, we ensure that our pupils are confident and curious and develop the skills and knowledge which can be applied across the curriculum and into the future. We do this by ensuring that:

- The science curriculum is practical and interactive, exploring a variety of different scientific enquiries.
- The science curriculum develops and progresses the pupil's knowledge and skills from EYFS to year 6.
- Pupils have ample opportunities to be involved in asking questions and finding answers through research, observation and investigation.
- Lessons are relevant and links to everyday life and the Whitley Values and that pupils are engaged and having fun whilst learning.
- Pupils witness the Possibilities of science through being introduced to key scientific figures that pupils can relate to, including female scientists, black scientists and children who are breaking into the scientific fields.
- Pupils have the opportunity to deliberately practise key skills so that they become part of their long-term memories.

<table>
<tr><th colspan="2">EYFS</th></tr>
<tr><td colspan="2">In the Foundation Stage, the learning and development of science is taught through the activities and experiences provided in the Knowledge and understanding of the world area of learning from the early years foundation stage framework. The knowledge, skills and understanding which children should have gained by the end of the Foundation Stage are laid out in the early learning goals. These experiences and skills prepare the children for work in Y1 onwards and subject specific study.

ELG: The Natural World Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - 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.</td></tr>
<tr><th>Key Stage 1</th><th>Key Stage 2</th></tr>
<tr><td>Pupils build on their scientific knowledge and observations with formal teaching of practical scientific enquiries, processes and skills. Pupils will ask simple questions and recognise that these can be answered in</td><td>Pupils extend their skills and knowledge in KS2 by using different and relevant scientific enquiry to answer questions; set up practical activities including comparative and fair tests; make systematic and careful</td></tr>
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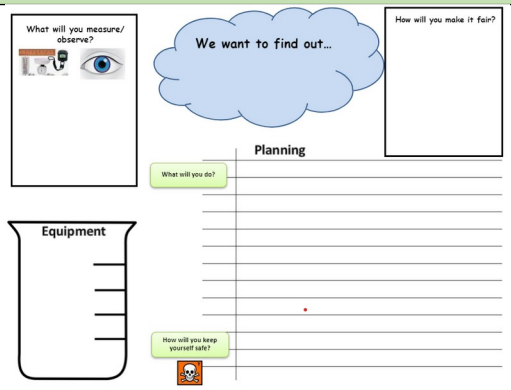
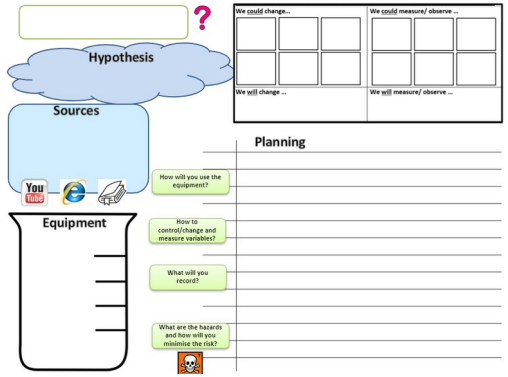
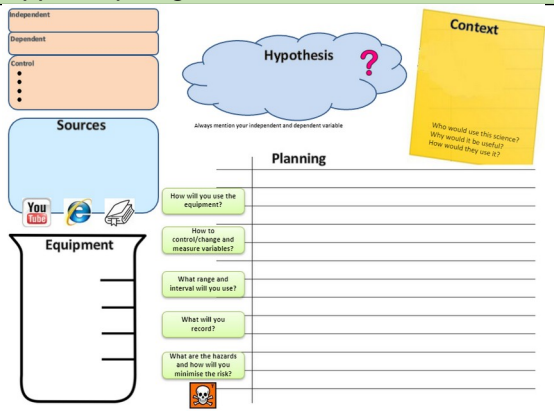
different ways; observe natural phenomena closely using simple equipment; perform simple tests; identify and classify as well as using their observations to suggest answers to questions. Pupils will begin to gather and record simple data.	observations; take accurate measurements using standard measurements, where appropriate; use a range of scientific equipment; gather, record, classify and present data in a variety of ways; record findings using simple scientific language; use results to draw conclusions, make predictions and suggest improvements or raise further questions.

Throughout all key stages, pupils are encouraged to develop and extend their resilience and perseverance in practical activities; using resourcefulness to question, make links and reason; to work as a team; to develop friendship, kindness, honesty and collaboration; to reflect on their investigations and observations, recognising when things can be improved upon or changed to produce more accurate results. In addition, pupils are made aware of the Possibilities curriculum driver by being introduced to relatable prominent scientific figures throughout the units of work.

Scientific Enquiry skills are taught progressively throughout each key stage we introduce seven science skills which children develop from ages 4 to 11 years:

- asking questions
- making predictions
- setting up tests
- observing and measuring
- recording data
- interpreting and communicating results
- evaluating

Scientific enquiry skills and the language of scientific enquiry are taught progressively as demonstrated below.

EYFS	KS1	Lower Key Stage 2	Upper Key Stage 2
Observe  Ask  Make Comparisons  	 	 	

Implementation

Staff Development

Staff take part in regular CPD sessions. Staff have had the chance to contribute to the school curriculum. The Science curriculum lead signposts staff to relevant training and webinars as well as resources to support teaching.

Resources

At Whitley Abbey Primary School, we use a variety of resources to provide our science lessons including The Hamilton Trust, STEM.org, the Primary Science Teaching Trust, Rising starts Science and Twinkl. In addition, we have a range of practical resources available on site and through the Schools Library Service.

Monitoring

Books are regularly monitored and feedback provided to teachers. Pupil voice is taken through pupil interviews and this helps to monitor knowledge retention and skills.

Assessment

Formative assessments are carried out throughout each lesson to ensure that misconceptions are recognised and addressed quickly. Staff carry out teacher assessments throughout a unit of learning, as well as at the end of the unit, to identify where support may be needed. Key assessment questions are used by teachers to support overall teacher judgements in the subject.

Work-life balance

The Hamilton Trust scheme and Rising Stars is used to ensure that staff have access to lesson plans and resources which can be easily adapted and differentiated. Both The Hamilton Trust and Rising Stars Curriculums follow the National Curriculum in a sequential way, ensuring that there is essential coverage as well as lesson structures, ideas and key skills to be taught for teachers who are non-specialists. During British Science Week, staff are provided with the topic, resources and prominent scientific figures for research.

EYFS

Our EYFS curriculum is planned but may be adapted to be responsive to pupil's interests

Example - Teacher Led experiences	Example - Enhanced Provision opportunities linked to Science
Nursery topics **In the topic 'Old McDonald had a Farm' (Year A) children will:** ~ Hatch butterflies ~ Plant and tend to a plant or flower (linked to appropriate texts throughout the topic). ~ Explore and respond to different natural phenomena in the setting. ~ Plant seeds and care for growing plants. ~ Notice detailed features of objects in their environment. ~ Talk about what they see, using a wide vocabulary. ~ Understand the key features of the life cycle of a plant and an animal **In the topic 'Once Upon a Time' (Year B) children will:** ~ Plant sunflower seeds and make observations **Reception topics** **In the topic 'Autumn and Winter' children will:** ~ Go for a nature walk in Whitley Woods making observations and comparisons – sorting and classifying ~ Identify key features of seasons. ~ Talk about some changes between the changes between Autumn and Winter. ~ Identify what happens when ice melts through play with ice. **In the topic 'Taking Care' children will:** ~ Experience the Living Eggs programme (hatch chicks). ~ Visit a farm - making observations – similarities and differences ~ Be able to instruct in the steps of how to brush teeth. ~ Know some of the needs of a living animal. ~ Know some of the needs of a living plant. ~ Compare animals from different countries. **In the topic 'Taking Care' children will:** ~ Name and discuss features of minibeasts. ~ Understand the life cycle of a butterfly and order the sections to reflect this understanding. ~ Make observational drawings of plants and animals. ~ Visit Ryton Pools to take part in minibeast activities and observe habitats	• Materials in tough tray e.g. ice, spaghetti, foam • Explore how different objects sink and float. • Small world animals and insects • Water and sand play in provision. • Exploring with magnets in provision. • Mud kitchen – explore differences in materials. • Sorting animals in the small world areas, creating habitats. • Garden – caring for the plants in their gardens. • General everyday discussion of what things are made from. . • Snack – healthy eating, naming fruit and vegetables. • Mud kitchen • Ramps and cars • Dolls and washing • Food and role paly in kitchen

Vocabulary Sun ,Rain, Water, Plant, Flower, Tree, life cycle, Explain, Plan, Question, Investigate, Rest, Tired ,Wash, Hungry , Energy, push, pull, food, habitat, sand, soli, grass, animal ,insect, fish, spring, summer, autumn, winter, weather, melting, burning, bending, hot, cold.	**Assessment Questions** Can children name some features of their environment? Can children names some common materials? Can children describe some changes that they observe? Can children sort and classify animals, plants or materials into two or more groups? Can children make accurate observations? Can children ask questions?

Year 1

	Term	Autumn	Spring	Summer	
Science	Deliberate Practice (Skills)	• **ask simple questions and recognise that they can be answered in different ways** • observe closely, using simple equipment • perform simple tests • identify and classify • **use observations and ideas to suggest answers to questions** • gather and record data to help in answering questions **Deliberate practise vocabulary: • Question, find out, observe, describe, test, compare • Measure, length, height, mass/weight, time, temperature • Record, results, table, chart, pictograph, block graph, bar chart**			
	SC1	**During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • Can children ask simple questions, recognising that they can be answered in different ways? • Can children observe closely, using simple equipment ? • Can children perform simple tests? • Can children identify and classify? • can children use their observations and ideas to suggest answers to questions? • Can children gather and record data to help in answering questions **?** •			
	Knowledge Assessment questions:	**Materials** **Assessment Questions:** • Can children identify the material and object is made from? • Can children identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ? • Can children describe the simple physical properties of a variety of everyday materials ? • Can children compare and group together a variety of everyday materials on the basis of their simple physical properties.?	**Animals Including Humans** **Assessment Questions:** • Can children identify and name a variety of common	**Plants** **Assessment Questions** • Can children identify and name a variety of common wild and garden plants, including deciduous and evergreen trees?	**Seasons** **Assessment Questions** • Can children name the four seasons Spring, Summer, Autumn, Winter? • Can children talk about season changes in weather?

		Year 2 • Can children identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ? • An children find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.?	animals including fish, amphibians, reptiles, birds and mammals • Can children describe what a mammal is? • Can children identify and name a variety of common animals that are carnivores, herbivores and omnivores • Can children describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • Can children identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	• Can children describe the difference between a deciduous and evergreen tree? • Can children identify, describe and label the basic structure of a variety of common flowering plants, including trees?	• Can children talk about the sun rise and sun set and the effect this has and how this changes throughout the year? • Can children talk about plants and how they change in the different seasons e.g deciduous and evergreen?
	Vocabulary	Properties, materials, objects	Fish, amphibian, reptile, bird, mammal , senses	Leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem, deciduous, evergreen	Spring, summer, autumn, winter • Day, night, light, dark, sunrise, sunset , weather

Year 2

	Term	Autumn	Spring	Summer
Science	**Deliberate Practice (Skills)**	• **ask simple questions and recognise that they can be answered in different ways** • observe closely, using simple equipment • perform simple tests • identify and classify • **use observations and ideas to suggest answers to questions** • gather and record data to help in answering questions **Deliberate practise vocabulary:** Question, find out, observe, describe, test, compare • Measure, length, height, mass/weight, time, temperature • Record, results, table, chart, pictograph, block graph, bar chart		
	SC1	**During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • Can children ask simple questions, recognising that they can be answered in different ways? • Can children observe closely, using simple equipment ? • Can children perform simple tests? • Can children identify and classify? • can children use their observations and ideas to suggest answers to questions? • Can children gather and record data to help in answering questions **?**		
	Knowledge Assessment questions:	**Materials – Around the home** **Assessment Questions:** **Year 2** • Can children identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ? • An children find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.?	**Animals and humans** **Assessment Questions:** **Year 2** • Can children notice that animals, including humans, have offspring which grow into adults • Can children describe the basic needs of animals, including humans, for survival (water, food and air) • Can children describe the importance for humans of exercise, eating the right amounts of	**Living things and their habitats** **Assessment Questions** **Year 2** • Can children identify ways in which different ocean animals have adapted to their environment? • Can children suggest reasons why different habitats are suitable for some animals but not others**?** • Do children know what a habitat is? • Do children know that animals and plants need to live in habitats they are suited to? • Can children match animals and plants to suitable habitats? • Can children name some different types of habitats? • Can children describe different types of habitats? • Can children compare habitats and the animals and plants that live in them? • Do children know what a micro-habitat is? • Can children name some micro-habitats? • Can children identify and describe some of the animals	**Plants – Locality Study** **Assessment Questions:** **Year 2** • Can children observe and describe how seeds and bulbs grow into mature plants? • Can children find out and describe how plants need water, light and a suitable temperature to grow and stay healthy?

			different types of food, and hygiene.	that live in micro-habitats? • Do children know that animals and plants in a habitat are dependent on each other for food? • Can children construct a simple food chain? • Can children construct food chains that include humans?	
	Vocabulary	• Soft, hard, rough, smooth, stretchy, stiff, shiny, dull, flexible, waterproof, absorbent, opaque, transparent, translucent Squash, bend, twist, stretch	Reproduce, offspring, grow, adults (fish, amphibian, reptile, bird, mammal, humans) • Survival, water, food, air, shelter • Exercise, fit, healthy, food, fruit, vegetables, meat, fish, eggs, nuts, pulses, beans, milk, cheese, bread, pasta, rice, butter, vegetable oil, olive oil	Living, dead, non-living • Habitat, micro habitat, food chain • Field, hedgerow, pond, woodland, seashore, ocean, rainforest, Arctic, desert • Air, food, water, shelter, heat, warmth, sun	Seeds, bulbs, grow, healthy, water, light, temperature, soil, nutrients

Year 3

	Term	Autumn	Spring	Summer
Science	**Deliberate Practice (Skills)**	• **ask relevant questions and use different types of scientific enquiries to answer them** • set up simple practical enquiries and comparative and fair tests • **make systematic and careful observation**s and, where appropriate, take accurate measurements using a range of equipment, including thermometers and data loggers • gather, record, classify and present data in a variety of ways to help in answering questions • **record findings using simple scientific language, drawings, labelled diagrams, keys, bar ch** • **report on findings from enquiries, including oral and written explanations, displays or pres** • use results to draw simple conclusions, make predictions for new values, suggest improvements and r • identify differences, similarities or changes related to simple scientific ideas and processes • **use straightforward scientific evidence to answer questions or to support their findings.** **Children know the name of a variety of scientists and can talk about their work understanding today.**		Deliberate Practise Vocabulary: **Observe, measure, record, chart, graph, evidence, hypothesis, prediction, enquiry, fair test, variable, experiment.** **research – relevant question equipment – thermometer, data – gather, standard units, record, classify, present record – drawings, labelled diagrams, keys, bar charts,** **ions**
	Knowledge Assessment questions:	**Animals Including Humans - Marie Curie** **Assessment**	**Forces and magnets** **Assessment Questions** • Can children explain what a force is? • Do children know that some forces need contact between	**Light** **Assessment Questions** • Can children recognize that light is needed to see? • Can children name some natural sources of light? • Can children name other sources	**Rocks** Mary Anning **Assessment Questions** • Can children compare and **Plants** **Assessment Questions** • Can children identify and describe the

		Questions • Do children know that humans get nutrition from what they eat? • Can children identify and group a variety of foods? • Can children recognise foods for growth and foods for energy? • Do children know that humans need to eat to grow and move? • Do children understand what is meant by the term 'balanced diet'? • Can children identify and describe which food groups we should eat most of and which food groups we should eat least of? • Do children know that different animals have different diets? • Can children use secondary sources to find out about the diets of different animals? • Can children recognise whether an animal is a herbivore, carnivore or omnivore? • Do children know that animals with a skeleton are called vertebrates? • Can children identify different bones in the human skeleton? • Can children compare bones in	two objects? • Can children identify pushes and pulls and explain the forces in action? • Do children know that forces can be measured in Newtons using a forcemeter? • Can children set up and carry out an investigation to explore how objects move on different surfaces? • Do children know that there are forces between magnets and that don't need contact between two objects? Can children tell you that magnets have two poles? • Can children record observations of magnets? • Can children make generalisations about what happens when magnets are put together? • Can children make and test predictions about whether materials are magnetic or not? • Can children make careful observations? • Can children group objects on the basis of whether or not they are magnetic? • Can children name some uses for magnets? • Can children use a variety of sources to find out about the different uses of magnets? Can children present the information they have found in an appropriate way?	of light? • Can children understand that light is reflected from surfaces? • Can children recognize that sunlight can be dangerous? • Can children identify how shadows are formed? • Can children find patterns in the way shadows change? • Do children know that dark is the absence of light? • Can children define the difference between night and day? • Do children know the difference between objects that are transparent, translucent, and opaque? • Can children explore shadows using torches and express their findings? • Know who is (Thomas Eddison)?	group different kinds of rocks? • Can children recognize the three types of rock and how they are formed? • Can children describe how soil is made from rocks? • Can children describe how fossils are formed? • Can children suggest ways of grouping rocks according to their characteristics? • Can children observe and compare rocks, and put them into different categories? • Can children justify their choices and explain their decisions? • Do children know what the terms 'erosion' and 'permeable' mean? • Can children plan and carry out an experiment to compare rocks based on certain characteristics? • Can children evaluate their results and draw conclusions? • Can children use a variety of sources to find out	different parts of flowering plants, including roots, stem / trunk, leaves and flowers? • Can children recognize that plants need air, light, water, nutrients and room to grow? • Can children understand how water is transported in plants? • Can children understand the role of flowers in the life cycle of a plant, including pollination, seed formation and seed dispersal? • Can children describe how seeds may be dispersed? • Can children describe how plants may be pollinated?

		animal and human skeletons? • Do children know the difference between vertebrates and invertebrates? • Do children know that internal skeletons support and protect the body? • Do children know how the bodies of invertebrates support and protect them? • Do children know that muscles help us move? • Do children know that muscles work in pairs to move different parts of the body? • Do children know that some animals have strong muscles for particular purposes?			information about rocks and their uses?	
	Vocabulary	skeleton, skull, bones, muscles, movement, support, protection, nutrition, diet, balanced diet, function, bone, vertebrates, invertebrates, herbivore, carnivore, omnivore.	force, contact, surface, magnetic, attract, repel, poles, newton, forcemeter, pull, push, attract	light source, mirror, reflect, reflective, reflection shadow, blocked transparent, translucent, opaque	**Fossil,** Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent, metamorphic, sedimentary, igneous, permeable, erosion, absorbent, crumble layer, sediment igneous, magma, lava, gas bubbles (tiny holes/spaces) change, squeeze, pressure	Flower, stem, roots, branch, trunk, Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower

Year 4			
Term	**Autumn**	**Spring**	**Summer**

Science

Deliberate Practice (Skills)

- **ask relevant questions and use different types of scientific enquiries to answer them**
- set up simple practical enquiries and comparative and fair tests
- **make systematic and careful observation**s and, where appropriate, take accurate measurements using s using a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- **record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, a**
- **report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- **use straightforward scientific evidence to answer questions or to support their findings.**

Deliberate Practise Vocabulary:
Observe, measure, record, data, chart, graph, evidence, hypothesis, prediction, enquiry, fair test, variable, research

Children know the name of a variety of scientists and can talk about their work and its influence on our understanding today.

Knowledge Assessment questions:

States of matter

Assessment Questions

Year 4

- Can children provide a definition of solid or liquid?
- Are children able to sort objects into solids and liquids?
- Can children name some of the properties of gases?
- Are children able to write a scientific definition of a gas?
- Can children describe the difference between the particles in solid, liquids and gases?
- Can children describe what melting is?
- Can children describe what freezing is? investigation?
- Do children understand that different materials have different freezing/melting points?
- Can children describe the process of evaporation?
- Can children give an everyday example of water evaporating?

Electricity

Assessment Questions

- Can children identify the purpose of different components in a circuit?
- Do children know that a complete circuit is needed for a device to work?
- Can children explain why some circuits will work and others will not depending on how the components have been put together?
- Do children understand that working with electricity can be dangerous?
- Can children identify devices that are powered by mains electricity and devices that are powered by batteries?
- Do children know that it is safe to carry out experiments with batteries but not with mains electricity?
- Can children construct a circuit to test which materials allow electricity to pass through?
- Can children explain that with some materials the bulb did not light because the circuit was not complete?
- Can children make generalisations about which materials are conductors and which are insulators?
- Can children name some conductors and insulators?
- Do children know that a switch can be

Living things

Assessment Questions

- Do children know what a habitat is?
- Can children identify a variety of habitats?
- Do children know that animals live in habitats that are suited to their needs?
- Can children identify similarities and differences between similar organisms?
- Can children group animals and explain the criteria that has been used to sort them?
- Can children

Sound - Leonardo DaVinci

Assessment Questions

- Do children know that sounds are made when objects or materials vibrate?
- Do children know that vibrations from sound sources travel through different materials to the ear?
- Do children know sound can travel through solids, liquids and gases?
- Do children know that some materials allow sound to pass through them

Animals and Humans (SRE)

Assessment Questions

Year 4 Only

- Can children identify the different types of human teeth?
- Do children know that the shape of teeth make them useful for different purposes?
- Can children suggest reasons why animals might have different types of teeth?
- Do children know that humans have two sets of teeth during their lifetime?
- Can children explain why it is important to look after teeth?
- Can children describe ways in which people can make sure their teeth stay healthy?
- Can children ask relevant questions?
- Can children use different sources of information to find the answers to questions they have
- asked?
- Can children name some of the organs associated
  -
- with the digestive system?
- Can children name the organs associated with the digestive system?
- Can children describe the basic functions of the organs associated with the digestive system?
- Can children describe the process of

		• Can children describe a way to increase the rate of evaporation? • Can children name each of the ways a material can change state? • Are children able to describe condensation and when it happens • water cycle is? Can children name the different stages of the water cycle? • Do children know that evaporation and condensation are processes that can be reversed? • Can children give the boiling and freezing points of water?	used to make or break a circuit to turn a device on or off? • Can children use their knowledge of conductors to create a working switch? • Can children explain how their switches work? • Can children make predictions about how to alter the brightness of a bulb? • **Can children name to components in a circuit?**	make careful observations to identify the characteristics of different organisms? • Do children know that animals can be categorised into broad groups according to their characteristics? • Can children use a classification key to help them identify which group an animal belongs to? • Can children identify a variety of animals that are vertebrates, invertebrates, mammals, amphibians, insects, reptiles, fish and birds? • Can children use a classification key to identify unfamiliar animals?	more easily than others? • Do children know that sounds get fainter as the distance from the sound source increases? • Can children carry out an investigation to explore what happens to sound as it gets further away? • Can children name some of the reasons why preventing sound to travel is sometimes important? • Can children plan a test to measure how well different materials muffle sound? • Can children draw conclusions about which materials muffle sound the best? • Do children know that the term ‘pitch’ describes how high or low a sound is? • Can children recognise changes in pitch and identify high and low notes?	digesting food?

					• Can children investigate different instruments and make generalisations about pitch? • Do children know that the pitch of a stringed instrument depends on the length, thickness and tightness of the string? • Can children suggest ways of testing what happens to the pitch of a string when you alter the length, tightness and thickness?	
	Vocabulary	Chemical change, reversible change, irreversible change, solid, liquid, gas, temperature, evaporation, condensation, water cycle, particle, freezing, heating, cooling.	appliance, battery power, main power, circuit, series, cell, battery, wire, bulb, switch, break in circuit conductor, insulator	vertebrates, invertebrates (+ 1 example of each) environment, habitat, classification key characteristics, organism	vibration, wave, volume, pitch, tone, insulation, sound, wave, pattern, volume, insulate, source, muffle	mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, nutrients, absorb, canine, incisor, molar producer, consumer, apex predator

Year 5			
Term	**Autumn**	**Spring**	**Summer**

Science	**Deliberate Practice (Skills)**	• **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 data and results of increasing complexity using scientific diagrams and labels, classification keys, ta 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 exp 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 **Children know the name of a variety of scientists and can talk about their work an understanding today.**				Deliberate Practise Vocabulary: **Observe, measure, record, data, chart, graph, evidence, hypothesis, prediction, enquiry, fair test, variable, dependant variable, independent variable, research, experiment, theory,**
	Knowledge Assessment questions:	**Forces** **Assessment Questions** • Do children know what weight is? • Can children explain why objects fall towards the centre of the Earth? • Do children understand the causal link between the mass of an object and the amount of force with which gravity acts on it? • Can children define friction? • Do children know that friction can be useful and give some examples? • Do children know that air resistance is a force that slows objects moving through the air? • Do children know that water resistance slows an object moving	**Living Things and their habitats** **Assessment Questions** • Can children name and describe the functions of the main parts of flowers? • Can children describe the life process of sexual reproduction in flowering plants? • Can children identify and label the parts of flowers? • Do children understand what asexual reproduction is? • Can children explain some ways in which plants reproduce asexually? • Can children describe the life cycles of some asexually reproducing plants? • Can children define some of the ways in which sexual reproduction in animals occurs? • Can children compare species that reproduce in different ways and consider reasons why? • Can children establish causal links between the life cycle of animals and their environment? • Can children compare the life cycles of animals living in different environments? • Do children understand what naturalists do? • Can they explain why the work of naturalists is important? • Can children describe the life cycle of at least 1 plant and 1 animal?	**States of matter/ materials and their properties** **Assessment Questions** **Year 5** • Do children understand the terms 'dissolve', 'soluble', 'insoluble', and 'solution'? • Can children make and explain their predictions about soluble and insoluble materials? • Do children know that evaporation can be used to separate soluble materials from water? • Do children know that filtering can be used to separate insoluble materials from water? • Do children know that when some materials are mixed together they cannot be separated again? • Do children know that when an irreversible change takes place a new substance is produced? • Can children recognise reversible and irreversible changes caused by heating and cooling? • Can children explain how to reverse a change caused by heating or cooling? • Do children know that new materials are formed when materials are burned? Can children explain why a certain material has been chosen for a specific purpose, based on its properties? (thermal/ conductor)	**Earth and Space - Edwin Hubble Kalpana Chawla Katherine Johnson** Mae Jemison **Assessment Questions** • Can children describe the Sun, Earth and Moon's shape as roughly spherical? • Are children able to clearly define the word orbit? • Can children describe the Sun, Earth and Moon's movements in relation to one another? • Can children explain how the rotation of Earth on its axis creates day and night? • Can children explain the apparent movement of the Sun across the sky? • Can children identify how long	**Animals Including Humans SRE** **Assessment Questions** **Year 5 Only** • Can children name and order the main stages in the life cycle of humans? • Can children broadly define the age ranges for each of the main

		through water? • Do children recognise that that levers and pulleys allow a small force to have a greater effect? • Can children explain what a gear is? • Do children recognise that the speed or amount of force transmitted is affected by changing the size of the gears in a transmission? Can children make transmissions where two or more gears work together?			it takes Earth to make a full rotation? • Can children describe the different changes that happen between seasons? • Can children use Earth's tilted axis to explain how seasons are created? • Can children describe the differences in seasons between two locations in opposite hemispheres? • Can children name the different phases of the Moon? • Are children able to order the phases of the Moon? • Can children describe how the phases of the Moon are created? • Are children able to define what a solar system is? • Can children explain the differences between geo- and heliocentric models of the solar system are? • Can children compare the ideas of the solar system we know now, with those held by Ptolemy and Copernicus? • Can children name the eight planets in our solar system?	stages? • Can children explain some of the physical changes that occur at different stages in the lifecycle of humans? • Can children describe the main stages of gestation in humans? • Can children explain how embryos and foetuses grow and develop in the womb? • Can children describe the needs of a newborn baby? • Can they compare the needs

					• Are children able to name the eight planets in order from nearest to farthest from the Sun? • Can children use researching skills to find relevant information on a topic?	of a human baby to those of other mammals ? • Can they describe the stages of developm ent that occur during childhood ? • Can children explain the initial changes that occur inside and outside the body at the start of puberty? • Can children correctly identify the parts of the body that change during puberty? • Can children explain in simple

						terms the role played by hormones in the growth of humans and other animals? • Can children explain some of the ways in which boys' and girls' bodies start to differ during • puberty? • Can children explain some ways in which the body changes during old age? • Can children describe some ways in which older people can stay fit and healthy? • Can children

						suggest some of the ways in which their bodies will be different when they are older?
	Vocabulary	Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys	Mammal, Reproduction, Insect, Amphibian, Bird, Offspring, naturalist, function, pollination	hardness, transparency, conductivity (electrical, thermal) solubility, solution dissolve, filter, evaporate, sieve, reversible, irreversible	Earth, sun, moon, solar system, axis of rotation, day, night, phases of the moon, star, constellation	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, hormones, lifecycle, adult, child.

Year 6			
Term	**Autumn**	**Spring**	**Summer**

Science	**Deliberate Practice (Skills)**	• **plan different types of scientific enquiries to answer questions, including recognising and contro** • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking rep when appropriate • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tabl 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 expla 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 **Children know the name of a variety of scientists and can talk about their work and its influence on our understanding today.** Deliberate Practise Vocabulary: **Observe, measure, record, data, chart, graph, evidence, hypothesis, prediction, enquiry, fair test, variable, dependant variable, independent variable, research, experiment, theory,**				
	Knowledge Assessment questions:	**Evolution and inheritance** **Assessment Questions** • Do children recognise that animals produce offspring that are like themselves? • Do children understand the term 'inherit'? • Can children explain why variation in offspring occurs? • Can children describe the conditions of an environment? • Can children identify characteristics which help an organism to be well suited to its environment? • Do children understand why different organisms in the same environment may have different characteristics? • Do children know that not all inherited characteristics are advantageous? • Can children explain why advantageous characteristics are more	**Electricity -** Benjamin Franklin **Assessment Questions** • Do children recognise what the difference between a series and a parallel circuit is? • Can children draw and/or construct working circuits with increased complexity? • Do children know that the brightness of a bulb or the speed of a motor can be changed in a circuit? • Do children know that the brightness of a bulb or speed of a motor depends on how much power is supplied to each component? • Do children know that bulbs and motors will blow out if too high a voltage is used? • Do children know why symbols are used to draw circuit diagrams? • Can children recognise the symbols for various common circuit components? (revise) • Do children know that the brightness of the bulb in a circuit can be altered by changing the wires? • Can children suggest questions to investigate, decide what to do and what equipment to use to test the	**Light** **Assessment Questions** • Are children able to identify light sources and describe how light travels? • Can children use their knowledge of how light travels to explain how a shadow is created? (revisit) • Can children explain why a shadow takes the shape of the object casting it? • Can children give a clear, scientific description of translucent, transparent and	**Living things and their habitats** **Assessment Questions** • Do children know that organisms can be grouped according to their characteristics? • Can children describe the characteristics of different classifications of animals? • Can children match animals to their group according to their characteristics? • Can children classify organisms according to broad characteristics? • Can children find ways to	**Animals including humans/ Body Health SRE** **Assessment Questions** • Do children know that in order to be healthy we need a balanced diet which includes different food groups? • Can children name some of the different food groups? Do children know which types of foods are included in different food groups? • Do children know why each different food group is important for a healthy lifestyle? • Do children know that the circulatory system transports blood and nutrients to the different parts of the body? • Can children describe how the circulatory system works? • Can children record their own resting pulse rate accurately? • Can children describe the functions of the heart? • Can children investigate how the heart is affected through exercise and draw conclusions? • Do children know that hearts need to have exercise to stay healthy? • Do children know that muscles work in pairs to move different parts of the skeleton? • # Do children know that when muscles exercise they need an increased flow of blood because the muscles are working harder? • Can children explain why their pulse rate

		likely to be passed from generation to generation? • Do children understand that whole species can evolve in this way? • Do children know that our understanding of process of evolution has developed over time? • Can children share what they have learned about the life and work of Charles Darwin? • Do children understand that fossils help us to find out about animals from the past? • Do children understand that a species can change over time due to mutations? • Do children understand that a species can change over time due to external factors such as competition from other species, disease or climate change? • Do children know that primate species (including humans) have changed over time? • Can children explain some ways in which human behaviour has changed the characteristics?	question? • Can children recall information they have found out about circuits and electricity? • Can children answer questions to demonstrate their knowledge? • Can children convey knowledge of circuits in a variety of ways?	opaque and how this property affects an object's shadow? • Are children able to describe and explain how an object's shadow can be manipulated? • Can children make informed conclusions from their investigations? • Can children name the parts of the eye? • Can children describe what the main parts of the eye do to help us see? • Do children understand that without light, we cannot see? • Can children name the parts of the eye and briefly describe what the main parts do? • Can children complete a diagram to show how light allows us to see an object? • Do children understand that all objects reflect an amount of light? • Can children give a scientific definition of the	distinguish between organisms that are similar? • Can children use appropriate scientific vocabulary to describe organisms and their features? • Do children know that plants can be sorted into groups according to their characteristics? • Do children know who Carl Linnaeus is and how he contributed to science? • Do children know that animals can be assigned to specific groups based on their characteristics? • Can children give reasons for why classification systems are important? • Do children know what micro-organisms are? • Do children know that micro-organisms can be classified into groups? • Do children understand that some micro-organisms can	increases when they exercise? • Do children know that drugs affect the way the mind or body works? • Do children know that some drugs are beneficial even though they may have unpleasant side effects? • Are children aware of some of the negative effects of tobacco and alcohol on the body? • Can children describe the impact that diet has on the body? • Can children describe why exercise is important for a healthy lifestyle? • Can children describe the harmful effects some drugs can have on the body? **Body Health (SRE)** **Medway SRE**

				word ‘reflect’? • Do children understand that the angle of incidence is equal to the angle of reflection? • Can children think of examples of how angled mirrors can be used in different ways? • Can children give a brief description of what happens to light when it’s refracted? • Are children able to differentiated between if an object will reflect or refract light? • Can children give some examples of objects which use refraction in a useful way? • Do children understand that white light can be split into a spectrum of seven colours?	be harmful and others can be helpful?	
	Vocabulary	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, species, climate, mutation ,survival of the fittest	Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell	Refraction, Reflection, Light, Spectrum, Rainbow, Colour, eye, pupil, iris, cornea, lens, optic nerve, brain, shadow	Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects	Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration, toxin, muscle