Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

Science @ Warton Nethersole's Primary School

Biology 

Chemistry 

Physics 

Curriculum Statement: Our curriculum is very closely linked to our vision "Be Courageous. Be Strong. Do Everything with love." and this is at the centre of our curriculum design. As a school with a fluctuating cohort and large differences in numbers within each year group, our curriculum overview links to our class structure with subject specific focus and emphasis on skills progression. This approach ensures high expectations and outcomes that challenge and develop every child's personal skillset. It is vital to us that our children have an inclusive curriculum that celebrates diversity and 'brings the world to Warton'

Vision: In science, we will inspire our children by giving them the opportunities to pursue their natural curiosity, awe and wonder of the world in which we live in. Our teaching will promote the experience of exploring and investigating scientific phenomena, in a range of meaningful and purposeful contexts, to ensure a continually evolving knowledge and understanding of the world around them. We recognise that our children live in an increasingly scientific and technological age and that they need to acquire scientific knowledge, skills and attitudes to better prepare them for modern life. Our children will be encouraged to ask questions, take risks, experiment, reflect, make and learn from mistakes, in a safe environment; whereby they are able to build upon and apply their core skills and knowledge which will equip them for an ever-changing world. Every child is a scientist.

Our science curriculum aims to:
- inspire a sense of excitement and curiosity about the world so that they understand the positive impact that science can have
- develop skills and knowledge that can be applied to everyday life
- explore and appreciate the work of significant scientists past and present
- develop knowledge progressively through the strands of biology, chemistry and physics
- allow every child to be a scientist that can answer scientific questions about the world around them

A key element our disciplinary knowledge is for all children to be able to carry out scientific enquiry through 5 key areas of: comparative and fair testing; research; observing over time; pattern seeking and identifying, grouping and classifying.

Disciplinary Threads

- Planning & Hypothesising
- Carrying out Scientific Enquiry
- Concluding
- Recording & Presenting Findings

Resources

- High Quality texts which are subject specific and age appropriate
- High Quality texts used in English lessons to compliment science lessons
- A range of scientific equipment and materials to support investigative learning
- Visits and visitors to school

Substantive Threads

- Biology: The Human Body; Animals; Plants; Habitats
- Physics: Earth & Space; Forces; Light & Sound; Electricity
- Chemistry: Properties of Materials; Changes of Materials

2024 Priorities (SIP)

- Increased clarity on substantive and disciplinary knowledge progression
- Explicit endpoints for each lesson and unit
- Increased retention and recall of knowledge and skills for pupils

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

Implementation – Planning & Lesson Structure

We have a clear pedagogical approach to our planning and lesson structure at Warton. The medium-term planning for science is set out to ensure ease of transfer from planning to teaching in order to ensure clear opportunities for recall and retention, clear knowledge and skills outcomes as well as specific assessment opportunities.

Planning / Lesson Structure	Key Question	Retrieval **"Let's Recap"**	Key Knowledge- linked to Substantive Knowledge **"Let's Learn"**	Learning Opportunity **"Let's Work"**	Key Skills -linked to Disciplinary Knowledge	Key Vocabulary	Exit Ticket **"Let's Check"**

Implementation: In order to ensure that our children 'know more, remember more and do more' our lessons have a focus on key questions, which we work together to investigate and answer throughout the unit of work. We also ensure a high focus on vocabulary and use weekly exit tickets to assess pupil's knowledge and address misconceptions and recap key facts the following week. We have a focus on 'making connections' through our lesson planning format, which includes clear and focussed retrieval activities. We also ensure that in KS2, there is a skill of finding links and evaluating findings both within science and across the curriculum.

In September 2024, for the first time, we are a one form entry school- with no mixed age classes. We have a carefully planned sequence of science lessons and themes that build upon each other in order to ensure challenge, skill development and deepening of knowledge threads.

Implementation – Curriculum Structure

Science is taught weekly for 5 half terms throughout each academic year plus two focussed STEM days in term 6.
Year 1 and 2 units cover 3 biology, 1 physics and 1 chemistry strand.
Years 3 to 6 cover 2 biology, 2 physics and 1 chemistry unit.

Year 1	My Body & My Senses	The Seasons	Everyday Materials	Plants	Amazing Animals	STEM
Year 2	Animals & Survival	Uses of Materials	Forces in Action	Plants & Growth	Habitats- The Arctic	STEM
Year 3	Skeletons & Muscles	Rocks & Fossils	Light & Shadows	Plants & Survival	Forces & Magnets	STEM
Year 4	Teeth & Digestion	Electricity	States of Matter	Sound	Classification & Environment	STEM
Year 5	Earth & Space	Classification of Species	Properties & Changes of Materials Part 1	Lifecycles inc. Growing Old	Forces	STEM
Year 6	Light & Perception	Properties & Changes of Materials Part 2	Evolution & Inheritance	Electricity & Circuits	Circulation & Lifestyles	STEM
	Biology	Chemistry	Physics			

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk

National Curriculum Coverage Key Stage One			
National Curriculum Area of Study	**Year Group**	**Subject**	**Unit of Work**
Plants -identify and name a variety of common wild and garden plants, including deciduous and evergreen trees -identify and describe the basic structure of a variety of common flowering plants, including trees	1	Science	Plants Term 4
Animals, including humans -identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals -identify and name a variety of common animals that are carnivores, herbivores and omnivores -describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) -identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	1	Science	Amazing Animals Term 5
		Science	My Body & My Senses Term 1
		Geography	Seas and Oceans Term 6
Everyday materials -distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock -describe the simple physical properties of a variety of everyday materials -compare and group together a variety of everyday materials on the basis of their simple physical properties	1	Science	Everyday Materials Term 3
		Science	STEM Projects Term 6
Seasonal changes -observe changes across the 4 seasons -observe and describe weather associated with the seasons and how day length varies	1	Science	The Seasons Term 2
		English	Tree Term 4
Living things and their habitats -explore and compare the differences between things that are living, dead, and things that have never been alive -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 -identify and name a variety of plants and animals in their habitats, including microhabitats -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	2	Science	Habitats – The Arctic Term 5
		English	Poles Apart / The Polar Bear Son (Term 5 & 6)
		Geography	Our Changing World: The Arctic Term 6
Plants -observe and describe how seeds and bulbs grow into mature plants -find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	2	Science	Plants and Growth Term 4
Animals, including humans -notice that animals, including humans, have offspring which grow into adults -find out about and describe the basic needs of animals, including humans, for survival (water, food and air) -describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	2	Science	Animals & Survival Term 1
Uses of everyday materials -identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses -find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	2	Science	Uses of Materials Term 2
		Science	Forces in Action (Push, Pull, Twist) Term 3

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

National Curriculum Coverage Lower Key Stage Two			
National Curriculum Area of Study	**Year Group**	**Subject**	**Unit of Work**
Plants -identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers -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 -investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	3	Science	Plants & Survival (Term 4)
		Geography	Our Changing World- The Amazon: Rivers, Rainforests and Land Use
Animals, including humans -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 -identify that humans and some other animals have skeletons and muscles for support, protection and movement	3	Science	Skeletons & Muscles (Term 1)
Rocks -compare and group together different kinds of rocks on the basis of their appearance and simple physical properties -describe in simple terms how fossils are formed when things that have lived are trapped within rock -recognise that soils are made from rocks and organic matter	3	Science	Rocks and Fossils (Term 2)
Light -recognise that they need light in order to see things and that dark is the absence of light -notice that light is reflected from surfaces -recognise that light from the sun can be dangerous and that there are ways to protect their eyes -recognise that shadows are formed when the light from a light source is blocked by an opaque object -find patterns in the way that the size of shadows change	3	Science	Light and Shadows (Term 3)
Forces and magnets -compare how things move on different surfaces -notice that some forces need contact between 2 objects, but magnetic forces can act at a distance -observe how magnets attract or repel each other and attract some materials and not others -compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials -describe magnets as having 2 poles -predict whether 2 magnets will attract or repel each other, depending on which poles are facing	3	Science	Forces & Magnets (Term 5)
		DT	Slingshot Cars (Year 4 Term 4)
Living things and their habitats -recognise that living things can be grouped in a variety of ways -explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment -recognise that environments can change and that this can sometimes pose dangers to living things	4	Science	Classification and Environment (Term 5)
		Geography	Climate Zones and Biomes (Term 4)
Animals, including humans -describe the simple functions of the basic parts of the digestive system in humans -identify the different types of teeth in humans and their simple functions -construct and interpret a variety of food chains, identifying producers, predators and prey	4	Science	Teeth and Digestion (Term 1)
States of matter -compare and group materials together, according to whether they are solids, liquids or gases -observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) -identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	4	Science	States of Matter

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

Sound -identify how sounds are made, associating some of them with something vibrating -recognise that vibrations from sounds travel through a medium to the ear -find patterns between the pitch of a sound and features of the object that produced it -find patterns between the volume of a sound and the strength of the vibrations that produced it -recognise that sounds get fainter as the distance from the sound source increases	4	Science	Sound (Term 4)
Electricity -identify common appliances that run on electricity -construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers -identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery -recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit -recognise some common conductors and insulators, and associate metals with being good conductors	4	Science	Electricity (Term 2)
		DT	Electrical Systems; Torches (Term 5)
National Curriculum Coverage Upper Key Stage Two			
Living things and their habitats -describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird -describe the life process of reproduction in some plants and animals	5	Science	Life Cycles (Term 4)
	5	PSHE	Changes -Jigsaw (Term 6)
Animals, including humans -describe the changes as humans develop to old age	5	Science	Life Cycles (Term 4)
Forces -explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object -identify the effects of air resistance, water resistance and friction, that act between moving surfaces -recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	5	Science	Forces (Term 5)
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 -describe the sun, Earth and moon as approximately spherical bodies -use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	5	Science	Earth and Space (Term 1)
Properties and changes of materials -compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets -know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution -use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating -give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic -demonstrate that dissolving, mixing and changes of state are reversible changes -explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	Year 5 Year 6	Science	Properties and Changes of Materials Part 1 (Year 5 Term 3) Properties and Changes of Materials Part 2 (Year 6 Term 2)
Living things and their habitats -describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals -give reasons for classifying plants and animals based on specific characteristics	6	Science	Evolution and Inheritance (Term 3)

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

Animals including humans -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	6	Science	Circulation and Lifestyles (Term 6)
		PSHE	Jigsaw: Healthy Me
Evolution and inheritance -recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago -recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents -identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	6	Science	Evolution and Inheritance (Term 3)
Light -recognise that light appears to travel in straight lines -use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye -explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes -use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	6	Science	Light and Perception (Term 1)
Electricity -associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit -compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches -use recognised symbols when representing a simple circuit in a diagram	6	Science	Electricity and Circuits (Term 4)

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk

Science Disciplinary Knowledge				
Diciplinary Knowledge				
	Planning & Hypothesising	Carrying out Scientific Enquiry	Concluding	Recording & Presenting Findings
Warton Overview	Asking relevant, purposeful and meaningful questions which can be investigated. Developing a line of scientific enquiry- identifying variables and generate a hypothesis. Choosing suitable equipment.	Comparative and fair testing Research Observing over time Pattern seeking Identifying, grouping and classifying	Making conclusions based on findings. Explaining the reliability of an enquiry. Evaluating methods and suggesting improvements.	Applying mathematical skills in order to record and present data in a variety of ways. Record and present findings orally and in writing.

Substantive Knowledge

Substantive knowledge is broken down into 3 strands- biology (split into 4 categories), chemistry (split into 2 categories) and physics (split into 4 categories. All 3 strands are taught within each year group from 1 to 6 with Year 1 and 2 covering 3 biology, 1 physics and 1 chemistry and year 3-6 covering 2 biology, 2 physics and 1 chemistry unit. Knowledge is carefully selected according to the above categories, and revisited across multiple units of study and in multiple year groups. Interleaving is used to ensure content is returned to on several occasions, therefore ensuring more of it is remembered for longer. Interleaving involves teaching subject content not in a continuous block, but in chunks which pupils revisit over time. This approach helps embed new learning in long-term memory, through the act of repetition. Repetition for learning is not simply about replicating previous lessons; it involves the act of retrieving previously learnt knowledge and then developing it.

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk

Substantive Knowledge

Biology

	The Human Body	Animals	Plants	Habitats
1	My Body & My Senses	Amazing Animals	Plants	
2	Animals & Survival	Animals & Survival / Habitats	Plants & Growth	Habitats – The Arctic
3	Skeletons & Muscles	Skeletons & Muscles	Plants & Survival	
4	Teeth & Digestion	Teeth & Digestion / Classification & Environment	Classification & Environment	Classification & Environment
5	Lifecycles including growing old	Classification of Species / Lifecycles	Classification of Species / Lifecycles	Classification of Species
6	Circulation & Lifestyles Evolution & Inheritance	Evolution & Inheritance		

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk

Substantive Knowledge

Physics

	Earth & Space	Light & Sound	Forces	Electricity
1	The Seasons			
2			Forces in Action	
3		Light & Shadows	Forces & Magnets	
4		Sound		Electricity
5	Earth & Space		Forces	
6		Light & Perception		Electricity & Circuits

Chemistry

	Properties of Materials	Changes of Materials
1	Everyday Materials	
2	Uses of Materials	
3	Rocks & Fossils	Rocks & Fossils
4	States of Matter	States of Matter
5	Properties & Changes Part 1	Properties & Changes Part 1
6	Properties & Changes Part 1	Properties & Changes Part 1

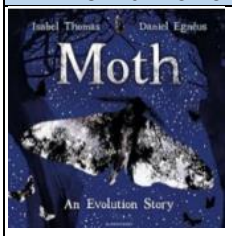
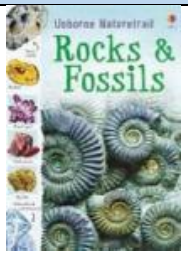
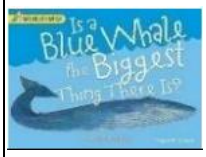
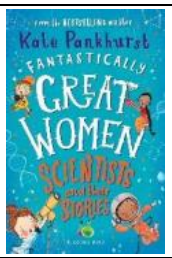
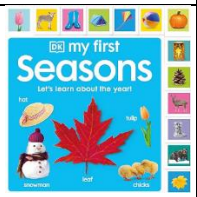
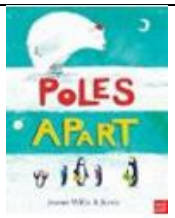
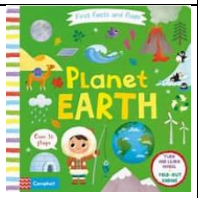
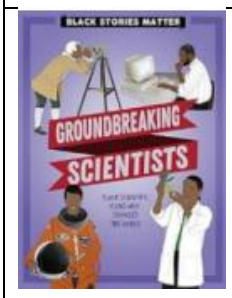
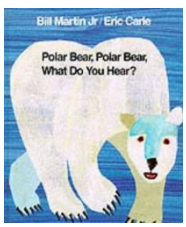
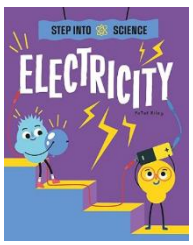
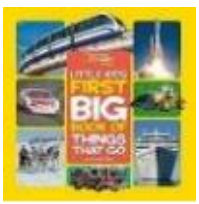
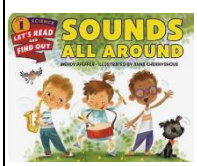
Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk

Books in Science

Our science curriculum has clear links with English, particularly with our reading and writing curricula where a range of high-quality reading texts engage pupils, develop their understanding of scientific concepts and develops pupils' 'Cultural Capital'. Writing opportunities are planned into our curriculum including learning about people who have shaped the world we live in through biographical writing and so sometime our books link to a 'Spotlight Figure'. We also have a range of high-quality texts linked to science units that are explored for either whole class reading for pleasure or as a non-fiction research text.

	Year 6 Moth: An Evolution Story Sci: Evolution & Inheritance		Year 3 Naturetrail: Rocks and Fossils Sci: Spotlight Figure: Mary Anning		Reception: Is a blue whale the biggest thing there is?
	Year 6 Fantastically Great Women Scientists Sci: STEM		Year 2 Bee & Me Eng: Non-Chron		Acorns Saplings (3-4) My First Seasons
	Year 5 Greta's Story Eng: Biography		Year 2 Poles Apart Eng: Poles Apart		Acorns Saplings (3-4) First Facts: Planet Earth
	Year 5 Little Ladies: Visionary Women around the World Sci: Spotlight Figure: Vera Rubin		Year 1 Tree Eng: The Seasons / Setting Description		Acorns Seedlings (2YO) Let's Wash our Hands
	Year 5 Black Stories Matter: Groundbreaking Scientists Sci: STEM		Year 1 Counting on Katherine Eng: Spotlight Figure: Katherine Johnson		Acorns Seedlings (2YO) Polar Bear, Polar Bear, What do you Hear?
	Year 4 Step into Science: Electricity Sci: Electricity		Reception My First Big Book of Things that Go!		Acorns Seedlings (2YO) Sounds All Around

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk

Memory, Schemata and Assessment

Knowledge is further embedded via the study of carefully selected texts in English, many of which complement the substantive knowledge covered in the pupil's books. The fiction texts read in English, provide pupils with an opportunity to apply the factual knowledge gained during science lessons. Opportunities to apply substantive knowledge across multiple subjects are purposely planned. For example, Year 4 learn about electricity in science in its standalone unit (Term 2) as well as through the unit of 'Torches' in Design and Technology in Term 5. This knowledge is further built upon in their Design and Technology unit in Year 5 where they complete 'Electrical Systems: Doodlers' and finally in Year 6 in Science when they complete the science unit Electricity and Circuits. There are also opportunities to further embed these skills in our STEM days in Term 6 and in our after-school clubs as well as through computing lessons where pupils use Microbits.

We use our Five-part Model lesson structure for our science lessons. These are designed with spaced practice at the heart of them. Spaced practice refers to a study schedule that involves studying material over a period of time, with breaks in between, to promote better retention of information. Across a unit of science study, children are provided with many opportunities to revisit and revise key learning, including:

- The use of carefully planned recap activities at the start of a unit, and again at the start of each lesson which covers key knowledge from the previous unit or lesson
- Science working walls summarise key learning for each question within a unit and explicitly define key vocabulary
- Each lesson ends with a low-stakes exit-task quiz that returns to the key knowledge covered in the lesson
- End-of-unit exit tickets are used as a summative assessment tool which involves a variety of questioning techniques and targets key learning
- At the start of the next unit, children return to their learning and recap key knowledge and any gaps from exit tickets are addressed.

Supporting all Pupils in Science

Through quality first teaching and a series of adaptive teaching strategies, we ensure that all pupils can access our science curriculum. This may be through modifying text excerpts or use of alongside copies, pre teaching or targeted adult support. We ensure that all children can access key learning and complete essential learning activities in a way that is meaningful to them.

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

Disciplinary Knowledge: Planning and Hypothesising

Asking Questions
Lines of Enquiry & Hypothesising
Choosing Equipment

Seedlings	**Birth to 5- Communication and Language (Ranges 3-4)** Beginning to ask simple questions (Speaking) **Birth to 5- Communication and Language (Ranges 4-5)** •Understands who, what, where in simple questions (e.g. Who's that? Who can? What's that? Where is?) ***(Understanding)*** **Birth to 5- Mathematics (Ranges 3-4)** • Shows an interest in size and weight • Explores capacity by selecting, filling and emptying containers, e.g. fitting toys in a pram • Beginning to understand that things might happen now or at another time, in routines ***(Measures)***
Saplings	**Birth to 5- Communication and Language (Ranges 4-5)** • Uses a variety of questions (e.g. what, where, who) (Speaking) • Questions why things happen and gives explanations. Asks e.g. who, what, when, how (Speaking) **Birth to 5- Understanding the World (Ranges 4-5)** Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world (The World) **Birth to 5- Communication and Language (Ranges 4-5)** •Uses talk to explain what is happening and anticipate what might happen next ***(Speaking)*** •Beginning to use a range of tenses (e.g. play, playing, will play, played ***(Speaking)*** **Birth to 5- Mathematics (Ranges 4-5)** • Explores differences in size, length, weight and capacity • Beginning to understand some talk about immediate past and future •• Beginning to anticipate times of the day such as mealtimes or home time ***(Measures)***
Willow – R	**Birth to 5- Communication and Language (Range 6)** • Uses talk to organise, sequence and clarify thinking, ideas, feelings and events (Speaking) **Birth to 5- Communication and Language (Ranges 4-5)** • Understands a range of complex sentence structures including negatives, plurals and tense markers ***(Understanding)*** **Birth to 5- Communication and Language (Range 6)** Uses talk to organise, sequence and clarify thinking, ideas, feelings and events ***(Speaking)*** **Birth to 5- Mathematics (Range 6)** • Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy • Becomes familiar with measuring tools in everyday experiences and play • Is increasingly able to order and sequence events using everyday language related to time • Beginning to experience measuring time with timers and calendars ***(Measures)***
Sycamore – 1	By exploring the world around them (through practical activities) ask people questions and use simple secondary sources to find answers. Does…/ will…/How does…/ why does… Make simple predictions by saying what they think will happen. I think that… With help, e.g. through class discussion, discuss different ways that a scientific question could be answered. Use simple measures and equipment e.g. Hand lenses, Egg timers. Rulers, Scales, Thermometers, Measuring jugs Begin to measure and record: lengths or heights; mass/weight; temperature
Beech – 2	With guidance (through prompting), use what they see, touch, taste, smell ask questions based on observations. And suggest how to find things out through discussion with the class/ a group. I wonder what/ if… Through discussion, and simple recording, say what they think will happen using the word 'predict' I predict that… With increasing independence e.g. as part of a group, discuss different ways that a scientific question could be answered. Use simple measures and equipment e.g. Hand lenses, Egg timers. Rulers, Scales, Thermometers, Measuring jugs To the nearest whole number, measure and record: lengths or heights(m/cm) ; mass (kg/g); capacity (l/ml); time
Maple – 3	Suggest how to find out the answer to a given question or a question that has been raised as part of a group. Through discussion, use a sentence stem, to make and record a prediction and reasons before testing. I predict that…because… Through discussion with others, e.g. in a group/ pair, start to make decisions about the most appropriate type of scientific enquiry and what observations to make in order to answer a question using the support of a sentence stem. In order to test this, we will…. Begin to say what equipment is needed. Learn how to use equipment e.g.: trundle wheels; scales; stopwatches Take accurate measurements using different equipment and units of measure (e.g. mm/cm/m; kg/g; l/ml)
Elm – 4	Suggest their own questions to investigate and ways to answer (through discussion). Through discussion with others, make and record predictions and reasons before testing. I predict that…because… Understand and use the term 'hypothesis' Help to make decisions about what observations to make and how long to make them for in order to answer a question as well as the best way for collecting information it. In order to test this, we will…. Begin to say what equipment is needed. Learn how to use equipment e.g.: thermometers; scales; stopwatches Take measurements using different equipment and units of measure (e.g. mm/cm/m; kg/g; l/ml; units of time)

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

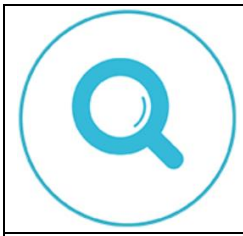
warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

Rowan – 5	Work as part of a group to plan and carry out an enquiry to answer a question. Independently suggest and record predictions, using prior knowledge giving reasons for their predictions. I predict that…because I know that…/ I hypothesise that…because I know that… With support, explore different ways to test an idea, choose the best way and give reasons. Take measurements using a range of scientific equipment with increasing accuracy and precision. Decide which units of measure they need to use. With prompting, begin to take repeated readings when appropriate and begin to understand the need to do this to reduce the impact of anomalies.
Oak – 6	Explore different ways to test an idea, choose the best way and give reasons. Choose the best way to answer a question and use information from different sources to plan an investigation. Use information to make predictions and give reasons for it. Make a prediction which links with other scientific knowledge. I predict that…because I know that…/ I hypothesise that…because I know that… Select and plan the most appropriate type of scientific enquiry to use and answer scientific questions. We chose to use this method because… Decide which units of measurement they need to use. Independently take repeated readings, understanding the term 'anomaly' Explain why measurement needs to be repeated. Find the mean of a set of data. Explain qualitative and quantitative data.

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

	**Carrying out Scientific Enquiry** Comparative and fair testing Research Observing over time Pattern seeking Identifying, grouping and classifying
Saplings	Birth to 5- Mathematics (Ranges 3-4) Beginning to arrange items in their own patterns, e.g. lining up toys (Pattern)
Seedlings	Birth to 5- Mathematics (Ranges 4-5) Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same (Composition)
Willow – R	Understand the word fair and use it to describe when something isn't even. Birth to 5- Mathematics (Range 6) • Spots patterns in the environment, beginning to identify the pattern "rule" • Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat (Pattern) Research a given range of secondary sources including film and books to find scientific information.
Sycamore – 1	Carry out simple tests as part of a class/ group Carefully observe changes as they happen and discuss them using sentence stems. Use a range of given sources including books to find key information about a given topic with support. Identify similarities and differences and trends such as more or less, higher and lower Use simple diagrams such as Carrol diagrams with one criteria to sort and organise things into groups. Through practical activities, start to use keys to identify things e.g. types of animals and plants.
Beech – 2	Carry out simple tests as part of a class/ group. Begin to use the vocabulary of 'fair test'. Begin to suggest why a test might be fair or unfair. I/We made sure that the test was fair by… Carefully observe changes as they happen and by reflecting on changes that have already happened and discuss them using sentence stems. Research a given topic using suggested scientific resources including books and the internet. Identify similarities and differences and trends such as more or less, higher and lower Use diagrams such as Carrol and Venn diagrams to sort and organise things into groups. Through practical activities, start to use keys to identify things e.g. earwigs, woodlice etc. Create their own simple identification keys.
Maple – 3	With support, plan a fair test and explain why it was fair (what variables were kept the same and what variable was changed). The variables that I have kept the same are… The variable that I have changed is… Research using a range of scientific resources including books and the internet and compare sources and information. Carefully observe changes and suggest ways to measure the changes Explain what they have found out and use their measurements to say whether it helps to answer the question. Use diagrams such as more complex (more than 2 criteria) Venn and Carrol diagrams to sort and organise into groups. Begin to suggest their own criteria for sorting.
Elm – 4	Recognise when a simple fair test is necessary and help to decide how to set it up, isolating variables. Explain why a test is fair and which variables have been isolated. The variables that I have kept the same are… The variable that I have changed is… Research a range of secondary sources beginning to consider reliability with support. Carefully observe changes and reflect on ways to measure the changes accurately Find patterns in their evidence or measurements. Identify differences, similarities or changes related to simple scientific ideas or processes. Begin to suggest their own criteria for sorting and organising things into groups. With support, begin to use Branching tree diagrams to classify things. Begin to create their own.
Rowan – 5	With increasing independence, recognise and control variables. Research a range of secondary sources commenting on their reliability. Find a pattern from their data and explain what it shows. Say whether their evidence supports or does not support their prediction. Choose a suitable method for making systematic observations and record observations in a variety of ways With support, develop their own more complex criteria for sorting and organising things into groups using precise scientific vocabulary. Develop their understanding of Branching tree diagrams, generating their own questions to create their own.
Oak – 6	Vary one factor whilst keeping the others the same in an experiment and explain why they do this. State which are dependent and independent variables. Research a range of secondary sources commenting on their reliability and any possible bias. Choose a suitable method for making systematic observations and record observations in a variety of ways. Reflect on observations made and suggest ways that they can be improved in future enquiries. Explain, in simple terms, a scientific idea and what evidence supports it. With increasing independence, develop their own more complex criteria for sorting and organising things into groups using precise scientific vocabulary.

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

	**Concluding** Making conclusions based on findings. Explaining the reliability of an enquiry. Evaluating methods and suggesting improvements.
Saplings	**Birth to 5- Communication and Language (Range 3-4)** Understands who, what, where in simple questions (e.g. Who's that? Who can? What's that? Where is?) ***(Understanding)***
Seedlings	**Birth to 5- Communication and Language (Range 4-5)** -Beginning to understand why and how questions ***(Understanding)***
Willow – R	**Birth to 5- Communication and Language (Range 6)** -Listens and responds to ideas expressed by others in conversation or discussion ***(Understanding***
Sycamore – 1	As part of a class/ group, say what they notice. Write in a sentence given a sentence stem. *I have noticed that…*
Beech – 2	As part of a class/ group, say what they have noticed and what this tells them. Write this in a sentence: *I have noticed that…* With support, suggest improvements and predictions for further tests. Evaluate whether the test was fair.
Maple – 3	Describe what they have found using scientific language. Use findings to draw simple conclusion. *I have noticed that…this shows that…* Suggest ways that the results could be more accurate With support, suggest improvements and predictions for further tests. Independently suggest improvements and predictions for further tests. Suggest how to improve their work if they did it again,
Elm – 4	Use their findings to draw a simple conclusion. Report findings from investigations through written explanations and conclusions. *I can conclude that…/ In conclusion…* Suggest ways that the results could be more reliable or more accurate Evaluate what they have found using scientific language. Make reference to a graph or diagram to answer a question. Evaluate and communicate methods and findings. Ask further questions and make predictions based on their data and observations. If I know that….then I know that…
Rowan – 5	Use a graph to answer scientific questions. Explain, in simple terms, a scientific idea and what evidence supports it. *I conclude that…because my results suggest that….* Use the language of cause and effect (causal conjunctions) to explain results e.g. causing, resulting in, this caused, as a result, consequently, to explain results. Are the results reliable enough to draw a conclusion? Was the methodology reliable? Use test results to make further predictions. Link what they have found out to other science. I wonder what would happen if I kept the …… and …. the same, but changed the…….
Oak – 6	Find patterns from their data and say what it shows. *My results show that…This helps me to conclude that…* Independently use the language of cause and effect (causal conjunctions) to explain results e.g. causing, resulting in, this caused, as a result, consequently, to explain results. Report and present findings verbally and in written forms for purposes such as presentation and display purposes. *Make reference to the reliability of results.* Evaluate the accuracy of the results. Use test results to make further predictions and set up further comparative tests.

Warton Nethersole's
Church of England Primary School

Maypole Road, Warton,
Nethersole B79 0HP

warton.bdmat.org.uk
office@warton.bdmat.org.uk
01827 894 182

	**Recording & Presenting Findings** Applying mathematical skills in order to record and present data in a variety of ways. Record and present findings orally and in writing.
Seedlings	Birth to 5- Mathematics (Ranges 3-4) • Shows an interest in size and weight • Explores capacity by selecting, filling and emptying containers, e.g. fitting toys in a pram • Beginning to understand that things might happen now or at another time, in routines (Measures) **Birth to 5- Mathematics (Ranges 3-4)** • Shows an interest in size and weight • Explores capacity by selecting, filling and emptying containers, e.g. fitting toys in a pram • ***(Measures)***
Saplings	Birth to 5- Mathematics (Ranges 4-5) • Explores differences in size, length, weight and capacity • Beginning to understand some talk about immediate past and future • Beginning to anticipate times of the day such as mealtimes or home time (Measures) Birth to 5- Mathematics (Ranges 4-5) • Explores differences in size, length, weight and capacity • Beginning to understand some talk about immediate past and future (Measures)
Willow – R	Birth to 5- Mathematics (Range 6) • Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy • Becomes familiar with measuring tools in everyday experiences and play • Is increasingly able to order and sequence events using everyday language related to time • Beginning to experience measuring time with timers and calendars (Measures) **Birth to 5- Mathematics (Range 6)** • Begins to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-" ***(Composition)*** • Beginning to experience measuring time with timers and calendars ***(Measures)***
Sycamore – 1	Begin to measure and record lengths or heights; mass/weight; temperature Record to the nearest whole unit Present results using simple pictograms, tally charts, block diagrams
Beech – 2	To the nearest whole number, measure and record lengths or heights(m/cm); mass (kg/g); capacity (l/ml); time Present results using simple pictograms, tally charts, block diagrams, tables
Maple – 3	Take accurate measurements using different equipment and units of measure (e.g. mm/cm/m; kg/g; l/ml) Present results using: Drawings, Labelled diagrams, keys, Bar charts, Pictograms, tables
Elm – 4	Take measurements using different equipment and units of measure (e.g. mm/cm/m; kg/g; l/ml; units of time) Record to 1 decimal place Interpret and present discrete and continuous data using appropriate graphical methods, including Labelled diagrams, Classification keys, bar charts, tables, time graphs.
Rowan – 5	Take measurements using a range of scientific equipment with increasing accuracy and precision. Decide which units of measure they need to use. With prompting, begin to take repeated readings when appropriate and begin to understand the need to do this to reduce the impact of anomalies. Explain why they have chosen specific equipment (including ICT based equipment). Record to 2 decimal places. Present results using: Scientific diagrams and labels, Classification keys, Bar graphs, Line graphs., Tables
Oak – 6	Decide which units of measurement they need to use. Record to 2/3 decimal places. Independently take repeated readings, understanding the term 'anomaly' Explain why measurement needs to be repeated. Find the mean of a set of data. Explain qualitative and quantitative data. Explain why they have chosen specific equipment (including ICT based equipment). Present results using: Scientific diagrams and labels, Classification keys, Scatter graph, Bar graphs, Line graphs, Pie charts