Science Policy		
Member of staff responsible	**Date Approved**	**Review Date**
Natalie Thompson	Spring 2024	Spring 2026

Intent

Our Philosophy for Teaching Science

At Yarlside Academy, we recognise the importance of Science in every aspect of daily life. We encourage children to be inquisitive throughout their time at our school and beyond by supporting children to accumulate and connect knowledge, concepts and skills in order to make sense of the world.

Children at Yarlside Academy will develop enquiring minds and a spirit of curiosity through vibrant, interesting and fun lessons. We foster a natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

National Curriculum

The national curriculum for Science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- develop the essential scientific enquiry skills to deepen their scientific knowledge
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts
- develop a respect for the materials and equipment they handle regarding their own, and other children's safety
- develop an enthusiasm and enjoyment of scientific learning and discovery

Our Curriculum

Our Science Curriculum has been carefully organised to cover all the National Curriculum aims. We use and adapt 'CUSP' to deliver a series of units which are deliberately spaced throughout the two key stages with opportunities to introduce and revisit key concepts. This approach enables pupils to deepen understanding and embed learning.

It is knowledge and vocabulary rich, to ensure children gain a deep understanding of the fundamental scientific knowledge and concepts. We focus on two types of knowledge:

1. **Substantive knowledge** - this is the subject knowledge and explicit vocabulary used to learn about the content. Common misconceptions are explicitly revealed as non-examples and positioned against known and accurate content. In CUSP science, an extensive and connected knowledge base is constructed so that pupils can use these foundations and integrate it with what they already know. Misconceptions are challenged carefully and in the context of the substantive and disciplinary knowledge. In CUSP Science, it is recommended that misconceptions are not introduced too early, as pupils need to construct a mental model in which to position that new knowledge.

2. **Disciplinary knowledge** – this is knowing how to collect, use, interpret, understand and evaluate the evidence from scientific processes. This is taught. It is not assumed that pupils will acquire these skills by luck or hope. Pupils construct understanding by applying substantive knowledge to questioning and planning, observing, performing a range of tests, accurately measuring, comparing through identifying and classifying,

using observations and gathering data to help answer questions, explaining and reporting, predicting, concluding, improving, and seeking patterns. We call it '**Working Scientifically**.'

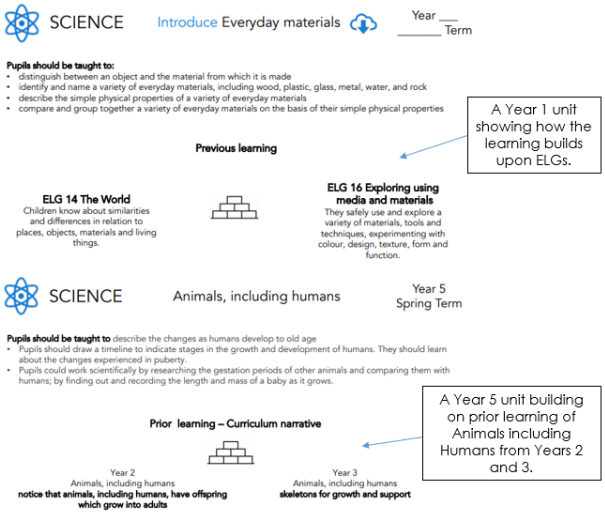
Working Scientifically skills:

- **identifying and classifying**
- **pattern seeking**
- **research**
- **observing over time**
- **fair and comparative testing**

Implementation

Curriculum Organisation

At Yarlside Academy, Science is taught across each year group in units that enable pupils to study in depth key scientific understanding, skills and vocabulary. Each unit aims to activate and build upon prior learning, including EYFS, to ensure better cognition and retention. Each unit is carefully sequenced to enable pupils to purposefully layer learning from previous sessions to facilitate the acquisition and retention of key scientific knowledge. Each unit is revisited later in the year, as seen on the Subject Overview, to ensure pupils retain key knowledge and information. Our Science scheme of work has been designed as a spiral curriculum with the following key principles in mind:



- **Cyclical:** Pupils revisit the key units throughout KS1 and KS2 following a spaced retrieval practice.
- **Increasing depth:** Each time a key area is revisited, it is covered with greater complexity.
- **Prior knowledge:** Upon returning to each key area, prior knowledge is utilised so pupils can build on previous foundations, rather than starting again.

Units of work (KS1 – KS2)

- Living Things and Their Habitats (Yr 2, Yr 4, Yr 5, Yr 6)
- Plants (Yr 1, Yr 2, Yr 3)
- Animals Including Humans (Yr 1, Yr 2, Yr 3, Yr 4, Yr 5, Yr 6)
- Inheritance and Evolution (Yr 6)
- Earth and Space (Yr 5)
- Materials (Yr 1, Yr 2, Yr 3, Yr 4, Yr 5)
- Forces and Magnets (Yr 3, Yr 5)
- Light (Yr 3, Yr 6)
- Electricity (Yr 4, Yr 6)
- Sound (Yr 4)

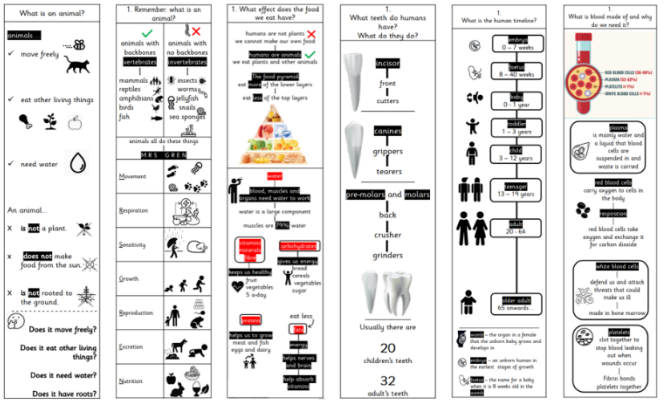
Timetable

4 (KS1) or 5 (KS2) units are taught in each year group and these are timetabled in so that Science is taught every half term, generally on a weekly basis otherwise through blocked sessions - this is decided by the teacher and is dependent on the topic content and length.

Teaching & Learning Approach

1. Knowledge Notes

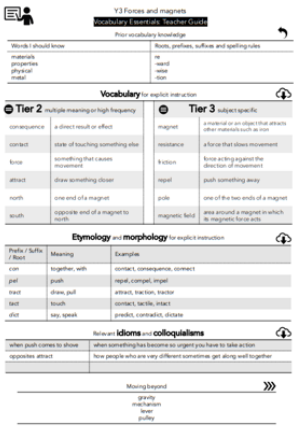
Accompanying each lesson is a Knowledge Note. Knowledge notes are the elaboration and detail which help pupils acquire the content of each lesson. They support vocabulary and concept acquisition through a well-structured sequence that is cumulative. Each Knowledge Note begins with a question that link back to the cumulative quizzing, focussing on key content to be learnt and understood. Knowledge Notes are dual coded to provide pupils with visual calls to aid understanding and recall.



Knowledge Notes – Animals including humans unit (lesson 1) from Years 1 to 6

2. Vocabulary

Vocabulary forms an essential part of our wider curriculum. 'CUSP' provides a vocabulary overview for each unit of work which includes prior vocabulary knowledge as well as new vocabulary. New vocabulary is split into Tier 2 (multiple meaning/high frequency) and Tier 3 (subject specific) language. Children are encouraged to use the correct scientific vocabulary when discussing their work and during experiments and investigations.



Vocabulary overview, including Tier 2 and 3 language as well as prefixes and suffixes.

3. Cumulative Quizzing

Quizzes are used from 'CUSP' to establish prior knowledge and understand the content of each unit. Throughout each unit, pupils continually revisit quiz questions (linked to current and prior learning) and previous content to reinforce key knowledge and vocabulary. At the end of each unit, pupils are given an 'assessment' quiz to check their understanding and knowledge. As part of spaced retrieval practice, these quiz questions are often revisited on an ad hoc basis to encourage recall.

4. Lesson Activities

Core principles are taught through activities that are relevant, practical, engaging and wherever possible, cross-curricular, providing both support and challenge for learners. We endeavour to expose children to a variety of practical investigations and experiments.

5. Educational Visits and Visitors

Where possible the curriculum is enriched by educational visits, such as Reception's visit to Lakeland Wildlife Oasis which is linked to their Understanding the World – Animals unit. Year 1 also visit Dalton Zoo which also links to their Animals unit. We also have visitors come into school to enhance learning, for instance Little Beasties visit Year 6 in Autumn Term linked to their Living Things and Their Habitats unit of work.

Classroom Organisation

Science is taught mostly within the classroom, however depending on the task, resources and/or space required, it could be taught in the Art and Music room, Children's Kitchen or outside. Children are generally taught in mixed ability groups.

Resources

Each year group has a list of equipment that they need in order to fulfil their units of work. All resources are stored in the Art and Music room, organised in topics where possible.

Provision for Lower and Higher Ability

Pupils in need of support are quickly identified and interventions are put into place to give a mixture of additional adult support and peer support, as well as increased verbal and live feedback during the session. Pre-teaching of scientific vocabulary provides all children with the opportunity to demonstrate an understanding of subject specific language. Knowledge Notes are duel coded to provide visuals and aid understanding and recall. In addition,

Knowledge Notes are utilised in all lessons to minimise cognitive overload, so children can use and apply their knowledge more easily.

Extra-Curricular Activities

STEM Club

EYFS

In Early Years, Science is taught through Understanding of the World. The children learn about the scientific world around them in their play and adult led activities. Our curriculum is designed to enable children to make sense of their physical world and community. Children are encouraged to be scientists by:

- Finding out about and showing curiosity and interest in features of objects, events and living things
- Describing and talking about what they see, including noticing similarities and differences
- Showing curiosity and asking questions about why things happen and how things work
- Showing understanding of cause-effect relation
- Noticing and commenting on patterns
- Showing an awareness of change
- Explaining their own knowledge and understanding, and asking appropriate questions of others
- Investigating objects and materials by using all of their senses as appropriate

Parents

We know how important parental involvement is in maximising our teaching and learning of science. Consequently, we keep parents up to date with their children's progress and involve parents as much as possible through:

- Sending information home regarding what the children have done in science at school using 'Tapestry' (EYFS) and through posts on our social media sites.
- Keeping parents up to date with our curriculum through newsletters and our website.
- Inviting parents into school to assist with lessons where possible.
- Individual children's progress and attainment is reported to parents termly through face-to-face meetings and am end of term report.

Transition to Secondary School

We work in close collaboration with our 'trust' secondary school, 'Furness Academy', to ensure our pupils' transition from primary to secondary is smooth and progressive. Science leads across the trust, meet annually to ensure that our curriculum, methods of assessment and approaches to teaching and learning are all consistent to enable maximum progress and attainment.

Continuous Professional Development (CPD)

Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust Science curriculum. Teachers are encouraged to watch the teacher videos available on 'CUSP' to develop their subject knowledge and aid their own acquisition of science skills and knowledge

Subject leads within our trust meet to share good practice. We have also liaised with the Secondary Head of Science within our trust to ensure we are teaching the correct content to make for an easier transition.

As subject lead, I have attended multiple courses, such as the Summer Primary Science Cumbria Conference.

Assessment

Formative Assessment

Alongside marking of children's work, all of the following methods of formative assessment are carried out in the classroom to continually assess children's progress and attainment:

- Questioning
- Observation

- Use of whiteboards for answering whole class questions
- Self-assessment
- Peer-assessment
- Quizzes
- Verbal feedback

Summative Assessment
Quizzes are completed by the children as end of unit assessments and these results are recorded to monitor attainment and progress across the year. These results are also used to assess which topic areas need more reinforcement and repetition. End of KS1 and KS2 Science Teacher Assessment results are also inputted on Scholar Pack.

Impact

Whole School Tracking

Assessment results are input into a tracking spreadsheet which enables teachers, subject leads and SLT to monitor progress and attainment on a half termly and annual basis, as well as tracking between key stages.

Subject Monitoring

Attainment and progression are monitored regularly through regularly reviewing and scrutinising children's work as well as organising discussions with children to talk about what they have learnt, understood and remembered about what they have been taught. Lessons are regularly visited to monitor the quality of teaching and learning. Staff are encouraged to feedback at staff meetings in order to continuously improve our teaching and learning.

Impact on the Children

Our children are enthusiastic learners who love Science, especially when there is opportunity for practical learning and investigations and experiments. They have a good understanding of scientific skills and are able to apply these skills across different units of work and across different subjects.

Children are very inquisitive and curious – asking sensible and appropriate questions. They confidently recall key knowledge and accurately use and apply key vocabulary. The STEM afterschool club is consistently popular and oversubscribed. Children enjoy the outdoor resources, such as the allotments.

Attainment and progress in Science is consistently high with KS1 and KS2 results always being well above average.