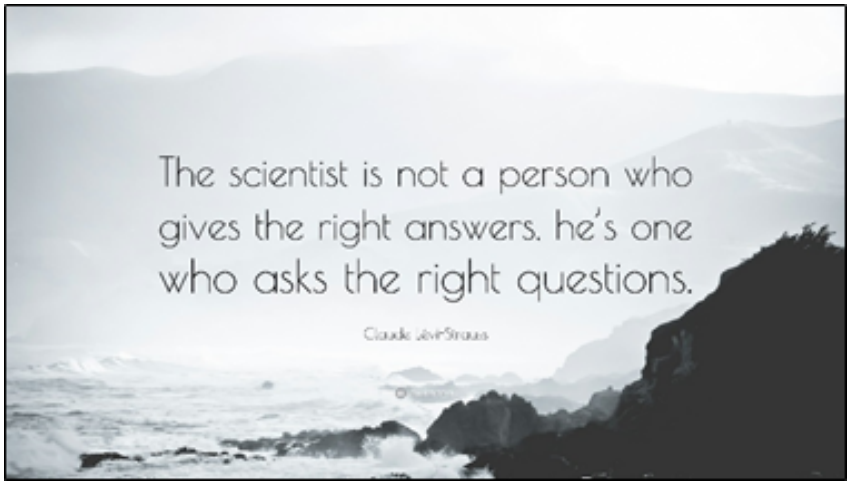
HOLSWORTHY
C OF E PRIMARY SCHOOL
Working together, growing together, all to flourish

SCIENCE INTENT STATEMENT



At Holsworthy C of E Primary we aim to equip our children with the knowledge and skills they need to become super scientists! We offer a science curriculum that evokes curiosity, excitement and understanding about the world around them through the specific disciplines of biology, chemistry, physics and Earth sciences. These areas are taught specifically as teachers progress through the 2014 National Curriculum for Science. We have defined these areas as the Big Ideas of Science:

Big Ideas of Science
Physics
P1: The universe follows unbreakable rules that are all about forces, matter and energy. P2: Forces are different kinds of pushes and pulls that act on all the matter that is in the universe. Matter is all the stuff, or mass, in the universe. P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.

HOLSWORTHY
C OF E PRIMARY SCHOOL
Working together, growing together, all to flourish

SCIENCE INTENT STATEMENT

Big Ideas of Science
Biology
B1: Living things are special collections of matter that make copies of themselves, use energy and grow. B2: Living things on Earth come in a huge variety of different forms that are all related because they all came from the same starting point 4.5 billion years ago. B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.

Big Ideas of Science
Chemistry
C1: All matter (stuff) in the universe is made up of tiny building blocks. C2: The arrangement, movement and type of the building blocks of matter and the forces that hold them together or push them apart explain all the properties of matter (e.g. hot/cold, soft/hard, light/heavy, etc). C3: Matter can change if the arrangement of these building blocks changes.

Big Ideas of Science
Earth Science
E1: The Earth is one of eight planets that orbit the sun. E2: The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate. E3: The Earth is made up of several layers, including a relatively thin rocky surface which is divided into tectonic plates, and the movement of these plates leads to many geologic events (such as earthquakes and volcanoes) and geographical features (such as mountains.)

HOLSWORTHY
C OF E PRIMARY SCHOOL
Working together, growing together, all to flourish

SCIENCE INTENT STATEMENT

As educators of a broad curriculum, we understand that concepts such as those outlined above are also referenced in other areas of learning, and make these links explicit in our teaching. For example, the substantive knowledge of the water cycle as a scientific and a geographical concept is made clear and we use appropriate technical vocabulary across these subjects.

We believe that children are natural scientists and have an innate sense of curiosity and wonder. We aim to harness this curiosity in their science learning by encouraging them to question everything and, through investigating, testing and observing, enable them to deepen their knowledge and skills. Where possible, we aim to use children's questions to inform our planning, enabling them to understand that their scientific curiosity is valued and will form the basis of future scientific learning.

We also believe that children learn best when working collaboratively to shape and stretch scientific concepts and share appropriate vocabulary. Where possible, therefore, we encourage learning in mixed-ability groups, where more confident scientists will gain the support they need from their peers under close scrutiny by the teacher.

To aid cognitive processes, teachers are encouraged to revisit previous learning where possible through low-stakes retrieval practices and effective questioning. To monitor whether children have achieved specific curricular goals we also include an assessment task during assessment week. This informs our teacher judgement of whether children are reaching age-related expectations. The assessment is not, however, used as a planning tool and teachers are clear that the curriculum should not be narrowed in order to answer test-style questions.

Implementation

The curriculum ensures progression of skills and cumulative learning, building on and supporting the children's metacognitive learning strategies through effective pedagogical and vocabulary-rich teaching. Subject specific vocabulary is taught and built upon as topics are revisited to ensure conceptual understanding can be used accurately and precisely.

All science learning begins with a Big Question. These encourage children to consider their understanding of what they will learn in a particular unit. They also allow teachers to steer children towards the correct vocabulary and enquiry skills they will use and act as a tool for AfL. In addition, this initial Big Question session will allow teachers to revisit prior learning, using it as a retrieval session to activate what pupils should already know.

HOLSWORTHY
C OF E PRIMARY SCHOOL
Working together, growing together, all to flourish

SCIENCE INTENT STATEMENT

Example of Big Questions are:

Year 1 (chemistry) Everyday materials: Why aren't umbrellas made of crisps?
Year 2 (biology) Living Things and Life Cycles: Are rocks dead?
Year 3 (biology): Why do plants have flowers?
Year 4 (chemistry): Where do puddles go?
Year 5 (physics): How do objects move?
Year 6 (physics): What is a rainbow?

Children will be encouraged in this session to ask and record their own questions in this session. Teachers will be clear about the importance of these questions and they should form a prominent part of the display on the Science Learning Wall. The questions will be referred to throughout the unit and, where possible, used as starting points for lessons. We are clear that all questions are valued and aim to answer each question as the unit progresses. Where questions are not answered, teachers should find time for children to either discuss them or research the answers themselves – as a class or in their groups.

Children will learn in their science groups and record their learning in their group's Working Scientifically Journal. These will replace individual exercise books to enable children to work collaboratively. They will also enable the teacher to target each group with specific feedback questions based on that group's ideas, questions, predictions and conclusions. Teachers will enable children to discuss these questions in their groups and record their answers. The Working Scientifically Journals should be considered working documents that encourage pupils to return to previous learning, build on ideas and revise their understanding both as a unit progresses and across units.

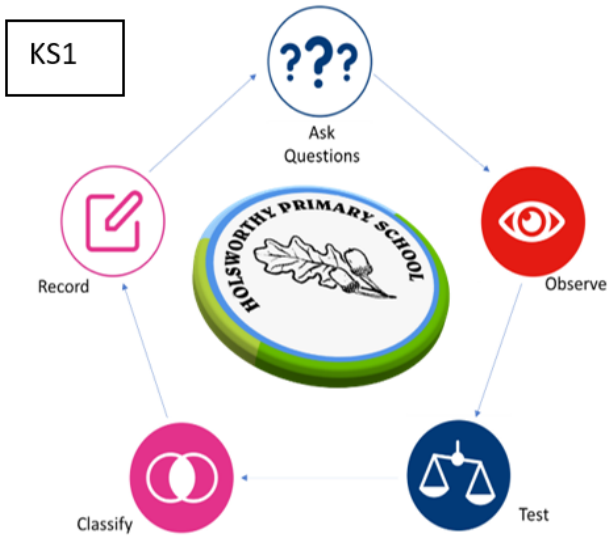
The four Big Ideas of Science will be made specific through teaching and on displays. For example:

HOLSWORTHY
C OF E PRIMARY SCHOOL
Working together, growing together, all to flourish

SCIENCE INTENT STATEMENT

We know that our children learn through enquiry-based learning, thus science at Holsworthy C of E Primary has been structured to ensure that our children have first-hand science experiences from the beginning of their learning journey. This allows for independent exploration and investigation that then leads to progression of communication.

They core skills of working scientifically are embedded in the curriculum and we aim to instil these in children so that they can define and discuss them with increasing confidence and understanding. These skills should be prominently displayed on Working Scientifically Journals, on displays and be referred to in every lesson. They are:



By embedding these practices explicitly, we aim to equip our pupils with the substantive and disciplinary knowledge they need.

In their Working Scientifically Journals, children will be expected to discuss and assess which skill they are developing or practising by completing the following grid

KS1	Today, we are working scientifically by...	
???	Questioning and Predicting	
	Testing	
	Observing	
	Classifying	
	Recording and Evaluating	

KS2	Today, we are working scientifically by...	
???	Questioning and Predicting	
	Conducting research	
	Testing	
	Observing	
	Classifying	
	Recording and Evaluating	
	Presenting	

HOLSWORTHY
C OF E PRIMARY SCHOOL
Working together, growing together, all to flourish

SCIENCE INTENT STATEMENT

We use a range of both formative and summative assessment strategies at Holsworthy CofE Primary:

- Self-assessment – the children evaluate their own learning;
- Peer assessment – the children work together to evaluate each other's learning;
- Ongoing formative assessment for learning by the teaching staff to assess working scientifically skills (disciplinary knowledge) and scientific understanding (substantive knowledge);
- Summative termly assessments to identify gaps, report to parents and inform teaching;
- Pupil questioning and discussion;

Attainment is recorded, providing an overview for each individual child. Overall attainment of each child is recorded termly to indicate whether at, above or below age-related expectations.

We aim for our children to achieve their full potential in science and marvel at the awe and wonder of how science emulates throughout every aspect of our daily lives. We want the children to recall the rich learning experiences they have been provided with and know that each new taught concept provides a new, or builds on an existing, learning block. We want our children to think critically, ask questions and use their metacognitive learning skills. Our children know to persevere and embrace challenge and as a result, enjoy their Eureka moments of success!