



# Science ON A PAGE

## WHAT WE TEACH AND WHY – (intent)

**Our school values** – The 6 Rs – underpin everything we do at RA Butler Academy Schools. The core values are promoted through the skills of scientific enquiry both as individuals and in collaboration with others. They are encouraged to be resourceful and respectful when organising equipment and to be resilient when analysing cause and effect. The children are articulate when they use a range of technical vocabulary to discuss scientific concepts, when predicting outcomes and when drawing conclusions.

**Design, content and sequencing** – The science progression document and LTP plan detail the progression of knowledge across the primary curriculum. Our science curriculum is designed to be ambitious and inspiring but ensuring that key concepts and knowledge are covered effectively. Key skills and knowledge in biology, chemistry and physics are developed over the years through a programme of revisiting and extending. Topics are linked to other areas of the curriculum to ensure that practice reinforces new concepts and learning is purposeful. The working scientifically skills are woven through all units to enable the children to become independent investigative scientists. Identifying the key skills for working scientifically has increased rigour in the assessment process and specific investigative vocabulary is introduced in a coherent manner. We ensure sufficient knowledge and skills for future learning are taught. Real context links to topics are used so that there is a clear purpose for learning.

Science is taught in blocks as we feel that this aids memory retention. The key themes are based on the National curriculum (see LTP overview grid). Science is a core subject and the amount of time that is made available to teach the subject should reflect this.

In KS1, the science units are used to familiarise the children with plants that grow in the school habitat and other habitats in the UK. Investigations are conducted around the school using the local environment in the following topics: living things and their habitats; plants; rocks and soils; light; and seasonal change.

Knowledge organisers summarise key learning and act as a point of reference for vocabulary. They are used and referred to when staff are planning; they are also given to the children for their reference at the start of each unit.

Trips: Early Years (visit of animals), Year 1 (Colchester zoo), Year 2 (zoo lab) Year 4 (local river trip to be planned in for the future?) Year 5 (space visit, Antarctic Exploration)

**Support** – We are currently exploring the use of extender questions to challenge GD children in lessons. The use of Post-it planning sheets can be used to support lower ability children in all scientific investigations. Individual class teachers differentiate learning for individual pupils and if reading and writing are barriers to assessment, alternatives forms of assessment should be used. In addition, we are currently developing unit assessments for all years groups that combine written forms of assessment with quizzes that enable all children to be able to demonstrate their knowledge, irrespective of their literacy skills.

**Integrating literacy fluency** – Extended pieces of writing, such as non-chronological reports, can be used as assessment tool at the end of science units.

## HOW IT'S TAUGHT – (implementation)

Strategies are used routinely by teachers to enable the children to embed their learning into their long term memory. These strategies are based on a range of techniques connected to retrieval practice including the use in lessons of knowledge organisers, low stakes quizzing, interleaving and annotated visual representations of information.

We use active learning techniques which teachers employ in the classroom to complement learning and give all children the opportunity to become actively engaged and to articulate their understanding.

We aim to keep the learning pace of all children at the highest level and ensure there is no 'glass ceiling' for any learner. We have a school wide focus on developing the children's knowledge and use of tier 2 and 3 vocabulary. Baseline data from Early Years 'knowledge and understanding of the world' assessments are used to inform planning in Reception and Year 1. A Science planning template is used in the two key stages. Retrieval practice techniques are used in each lesson. When appropriate, science lessons with a heavy writing content, such as an extended write at the end of a unit, becomes the English lesson.

An investigation is completed at least every half term. Each year group should be focussing on a set number of the learning scientifically objectives and each unit should focus. Biannually, we celebrate science week (alternately with art) welcoming in science specialist parents to inspire children. Science week promotes enthusiasm for science across the school and engages parent involvement.

The Enthuse project, launched in January 2019, has enabled us to improve our links with industry (AstraZeneca) and promote greater collaboration between the schools in the partnership. In particular, this has provided staff with greater access to CPD, such as twilight sessions on electricity and gears/pulleys, in order to enable staff to create engineering projects that will engage children as they study electricity and forces in Years 5 and 6.

## WHAT WE SEE AS A RESULT – (impact)

How is science assessed?

The children's knowledge and understanding is assessed through their responses to questions in lessons, both verbal and written. Summative assessment, in the form of a quiz or an extended response to a questions, also takes place at the end of each unit. The Working Scientifically Skills specific to each unit are assessed through observations and children's written work.

Year 2 data:

Year 6 data:

PPG data: