

Curriculum Subject Statement: Science

The principles for River Bank Primary school's curriculum design follows Dylan William's *Principled Curriculum Design* (2013), which are:

- *Balanced*
- *Rigorous*
- *Coherent*
- *Vertically Integrated*
- *Appropriate*
- *Focused*
- *Relevant*

Details of how these have been incorporated into our overall curriculum design can be found on the *River Bank Primary Curriculum Intent Statement document*.

In specificity to Science, some of the applications are further explained, below.

A 'Balanced' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. All learning content for Science is taken from the National Curriculum programme of study and all statutory objectives are covered throughout EYFS, KS1 and KS2.
2. Science has 4-6 sequenced topics in each year group, which are taught weekly, or threaded throughout EYFS themes, and are protected from being replaced by other subjects. Curriculum content is not 'blocked', but individual lessons can be extended in cases where more time is essential to understanding or scientific enquiry requires it.
3. Trips and visits are planned carefully to support curriculum content and to offer children an experience which is both memorable and informative. Examples of this would be: local environment walks to parks, zoos, woodlands and the seaside (key stage 1) visits from the farm (EYFS) and zoo lab (year 1); an offering an eco-club (key stage 2)

A 'Rigorous' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. All of the science is taught through a context of exploring 'scientific phenomena' knowledge and 'working and thinking scientifically' which seeks to understand and explain the former.
2. 'Working and thinking scientifically' is sequenced through all topics to relate to the substantive science content across the curriculum.
3. Through 'working and thinking scientifically' children are taught to understand and predict how the world operates, that scientific ideas change and develop over time and apply these ideas to different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, finding things out using a wide range of secondary sources of information, drawing conclusions based on their data and observations, using evidence to justify ideas, and using scientific knowledge and understanding to explain findings.
4. The concept of the natural world is thread throughout the curriculum. Children will explore factually and through working scientifically how organisms are organised, life-cycles/spans, how organisms need sources of energy, reproduction as well as inheritance, evolution and extinction.

5. The concept of objects and earth and the universe are equally as rigorous. Whilst exploring the concept of objects children will look at matter, states of matter, materials and their properties, forces, electricity and sound. Whereas through earth and the universe children will investigate the earth's structure, rocks and fossils, the planets and solar system and how this impacts day and night and the seasons.

A 'Coherent' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. The science curriculum has been carefully designed and sequenced to build on previous knowledge and have subsequently knowledge then continued to be built. This coherence is designed across curriculum areas. For example, 'Animals, including humans' are taught through 'Animals, including humans in science in all year groups, including EYFS, focusing upon naming animals, their diet, how they grow and their body structure. In geography later in the term, it's focus extends to animals that are indigenous to continents. Subsequently, non-chronological reports are written in English titled 'Animals from the seven continents' where this knowledge is implemented. Appropriately levelled texts are used in guided reading sessions to further build upon this knowledge; and in art the children are exploring self-portraits through the work of Henri Matisse. All of this knowledge is sequenced in a way which is coherent and builds upon and revises key knowledge.

A 'Vertically Integrated' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. Science material taught at one point in time builds on material taught earlier, and feeds what is to be taught. An example of this would be: identifying flowers and trees and describing their features (EYFS). Knowing the names of local plants and naming the four main parts of a flower (year 1). Understanding what plants need to grow, where plants grow and plants that we eat (year 2). Looking at plant pollination, conducting comparative tests to see how plants grow (year 3). Understanding humans positive and negative impact on plants and environments (year 4). Looking the parts of a plant that reproduce (year 5). And classifying algae, moss and ferns (year 6).
2. A further example of this through working scientifically would be: identifying and observing quantities of plants throughout the seasons (EYFS). Identifying, classifying and labelling plants (year 1). Performing simple tests and using equipment to gather and record data on how plants grow (year 2). Setting up simple comparative tests and taking accurate measurements of plant growth in different conditions (year 3). Identifying changes related to scientific ideas of climate change (year 4) Recording plant dispersion using scientific diagrams and labels and devising their own investigation to show this (year 5). And creating and using classification keys and tables to determine different plant types (year 6).

An 'Appropriate' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. Science material is sequenced and taught from the National Curriculum on a 'year by year' basis.
2. Children are not set according to ability in Science.

3. In Science, independent learning tasks are set by the teachers using the 'Slope of Difficulty' approach, with any misconceptions / misunderstanding picked up through feedback in the next section or same-week intervention.
4. Appropriate differentiation will be made to support SEND pupils, by looking at their individual learning journey and selecting their appropriate next steps from the curriculum. In some cases, learning material may be supplemented using vocabulary or visual aids and tasks adapted to suit the needs to individual children.
5. Essential knowledge is tested as part of low-stakes retrieval practice at the start of each Science session.
6. Taught science knowledge is supplemented with scientific enquiry tasks to deepen understanding of scientific concepts.

A 'Focused' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. Science medium-term planning highlights material we consider essential amongst other important material.
2. The essential Science knowledge makes up much of the retrieval practice that takes place at the start of each session.
3. Each year, the Science content is reviewed and refined with teachers, year leaders and curriculum leaders.
4. Each year, the scientific enquiry tasks are updated to reflect current scientific ideas and equipment.

A 'Relevant' Science Curriculum

At River Bank primary school this is evident in our curriculum design in the following ways:

1. In Science, children are able to engage with school trips which offer experiences to children and to make learning as concrete as possible. For example: visits to the school's pond and eco-area, multiple visits throughout EYFS and Key stage one to the local park for seasonal walks, visits from zoo lab and a trip to Whipsnade zoo (year 1); visiting the greensand trust (year2) Living rainforests (year 5); North and South Pole VR experience (year 6)
2. An after optional school Eco-Club is offered to years 5 and 6.
3. In Science the material within our curriculum areas is relevant to the children's own interests and helps our pupils be good citizens of the future. This includes: looking at climate change, key scientific figures, space and our solar system, famous scientists, space, fossils and states of matter.