



## Science Approach Angel Oak Academy

### Substantive Knowledge

Our science curriculum at Angel Oak Academy is based on knowledge. Science teaching is built on the understanding that you cannot work scientifically without knowledge: you cannot explain the celery placed in food dye changing colour without prior knowledge of transpiration; or you cannot conclude an investigation on the speed of sound through solids, liquids and gasses without knowledge of particle structure. By explicitly teaching pupils the knowledge first, we build semantic memory (memory of facts or concepts) devoid of misconceptions, rather than episodic memory (memory of experience) filled with misconceptions that arise from allowing children to discover science for themselves.

Our curriculum has been designed to allow our pupils to understand and ask questions about the world through the disciplines of biology, chemistry and physics. The sequence of knowledge and concepts has been carefully ordered to allow pupils to build on existing schemas. Technical terminology is explicitly taught and pupils are supported in articulating scientific concepts clearly and precisely.

In order to ensure this knowledge is retained in long-term memory, spaced retrieval is addressed through regular low-stakes quizzing and quadrants.

### Disciplinary Knowledge

Once the substantive knowledge is secure, pupils' understanding is developed through the different types of scientific enquiry: observing over time, pattern seeking, identifying, classifying and grouping, comparative and fair testing, and research using secondary sources. Opportunities for scientific enquiry are embedded into the units of work, and pupils learn to use a variety of approaches to answer relevant scientific questions.