Kneesall C of E Primary School
Science Overview

Science Intent
Why do children at Kneesall study Science? At Kneesall C of E Primary School, our intent is to give every child a broad and balanced Science curriculum which enables them to confidently explore and discover the world around them, so that they have a deeper understanding of the world we live in. We want our children to be curious and to ask questions. We want them to have the skills to seek answers to these questions. We want our children to be ambitious and to see themselves as future scientists in jobs such as, pharmacists, biologists, physicists etc. To achieve this, our science will involve exciting, practical hands on experiences that encourage curiosity and questioning whilst developing knowledge, skills and a science rich vocabulary. As well as a coherently planned and sequenced curriculum, we will offer enrichment through visits, visitors and other learning experiences. Links to other areas of the curriculum will be made, strengthening the children's' understanding of how all learning links together. Our curriculum will meet the needs of all our children equipping them with, not only the minimum statutory requirements of the science National Curriculum, but to prepare them for life and future learning.
What are the aims for the Science curriculum? For pupils to have a secure understanding of the domains of Science: Physics, Chemistry, Biology and Earth Science (tied in with Physics) Physics 1. The universe follows unbreakable rules that are all about forces, matter and energy. 2. 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. 3. Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it. Chemistry 1. All matter (stuff) in the universe is made up of tiny building blocks. 2. 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). 3. Matter can change if the arrangement of these building blocks changes.

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Biology

1. Living things are special collections of matter that make copies of themselves, use energy and grow.
2. 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.
3. 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.

Earth science

1. The Earth is one of eight planets that orbit the sun.
2. The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate.
3. 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.)

Throughout their time at Kneesall, we want our children to have an ongoing understanding of and to continuously explore the following:

- The power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.
- How science can be used to explain what is occurring, predict how things will behave, and analyse causes.
- A knowledge of scientific vocabulary, which aids their knowledge and understanding not only of the topic they are studying, but of the world around them.
- Make sense of the world in which we live through investigation.
- Explore their environment in a safe way and make connections with concepts they may take for granted.

What are the local area/community links/special historical features in the area?	**What links to careers can be made through the Science curriculum?**
Forest School Local farm land National Stone Centre, Matlock Sherwood Forest	Children are given the opportunity to realise that any career is accessible to them, no matter their gender, race etc. We promote Scientific careers through our studying scientists as part of our projects and through British Science Week. We promote Science Capital in our learning to help children realise that Science is all around them and can become a career of their choice.

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Jordan Castle Farm, Wellow Magna Perlethorpe Outdoor Education Centre National Space Centre Sherwood Observatory	

How are British Values taught through Science?

Individual liberty of own views, tolerance and mutual respect of others' views is taught through the topics where different views / ethics are involved, for example work in Upper Key Stage 2 on the theory of evolution. Pupils develop an awareness of health & safety for themselves and others when working practically. Pupils are taught the social skills around behaviour and self-regulation to ensure collective responsibility for a safe and efficient working environment. They are taught to challenge each other's behaviour or practices if they fall short of the collective expectations of the group.

Science Implementation

Our whole school approach to the teaching and learning of science involves the following; planning, key questions and vocabulary are identified, linked to each unit of work. Sequenced lessons are planned, linked to these questions, with precise learning intentions to ensure progressive knowledge and skills. Lessons involve retrieval activities and problem solving opportunities that allow children to research, think deeply and find answers for themselves. Children are encouraged to ask their own questions and are given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Relevant scientific vocabulary is defined, displayed, and modelled during each lesson. Teachers use precise questioning in class to test conceptual knowledge and skills. We build upon the prior scientific learning, knowledge, and skill development of the previous years to ensure learning is progressive for Kneesall pupils and to aid retrieval. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.

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Inspirational scientists and engineers, both past and present are introduced through curriculum units alongside socio-scientific questions. Visits and visitors are used to enhance learning across units of science.

The Science curriculum at Kneesall is connected through threads of learning that the children progress through throughout the years. Through this progression, we are enabling children to make connections to previous knowledge and skills learnt and recall on this to progress their learning further.

- Plants
- Animals including humans
- Materials
- Seasons
- Living things and their habitats
- Rocks
- Light
- Forces
- Sound
- States of matter
- Electricity
- Earth and Space
- Evolution and Inheritance

Although some of these threads may not be apparent in every year group, their learning stems from previous years and will be used as building blocks to extend this knowledge into KS3 and beyond. Many of these threads interweave and one cannot extend their learning without the other; for instance, to learn objects cause shadows dependent on their properties. In year 4 (light), we need to recall our knowledge from year 2 and the properties of different materials (materials).

Monitoring, Progression and Assessment

Regular monitoring across the year groups is achieved through work scrutiny, pupil voice, looking at evidence of good practise and identifying areas of improvement.

Assessments are made at the end of each term to determine at what level of understanding each child is working towards. This will include retrieval of key knowledge-based facts alongside discussion with the child about the work they have produced.