

Science at Litcham School

INTENT

1. To deliver the Science National Curriculum.
2. To deliver a knowledge-led spiral Science curriculum, where knowledge and skills are taught and consolidated.
3. To deliver a broad Science curriculum that includes Biology, Chemistry and Physics that is appropriate for every student.
4. To promote high expectations and aspirations and a secure understanding of the scientific method. Students will be prepared to be active citizens after leaving school.
5. To deliver an engaging and enjoyable Science curriculum that is knowledge rich and allows students to develop the appropriate practical skills to work scientifically and provides opportunities for enrichment. Pupils will be well prepared to pursue Sciences after leaving school.

IMPLEMENTATION

Curriculum Delivery

- Pupils in Early Years Foundation Stage (EYFS) have experiences with materials such as wood and plasticine and experiment with through water play. The Forest School approach complements the delivery of Science in EYFS. The children learn more about the world around them through their Science learning.
- Pupils in Year 1 to Year 6 follow the Science National Curriculum using resources from Developing Experts. This resource helps teachers to secure their subject knowledge and has engaging animations and video clips.
- Pupils in Year 7 to Year 8 follow the Science National Curriculum using resources from Pearson Exploring Science. Pupils have 7 lessons a fortnight with either one of two specialist Science teachers. Pupils study topics that cover the main principles of Biology, Chemistry and Physics including 'Cells', 'Atoms' and 'Energy'. Pupils have individual logins to the electronic version of the textbooks through the 'ActiveLearn' website.
- In order to maximise opportunities to complete practical work, pupils start the GCSE in year 9 with topics that are familiar to them from Key Stage 3 ('Cells', 'States of Matter' and 'Forces'). Pupils in sets 2-4 study the Edexcel GCSE (9-1) Combined Science (1SC0). This allows them to gain 2 Science GCSEs at grades 99-44 for set 2 (higher tier students) and grades 55-11 for sets 3 and 4 (foundation tier students). Final decisions regarding tiers of entry are made during Year 11. Pupils in set 1 (top 20% of the cohort) study the separate science courses: Pearson Edexcel GCSE (9-1) Biology (1BIO), Chemistry (1CH0) and Physics (1PH0). This allows them to achieve 3 GCSE grades rather than 2 although this is completed in the same amount of time as Combined Science. Pupils have individual logins to the electronic version of the textbooks through the 'ActiveLearn' website and are also able to consolidate their understanding through using the GCSE Pod website. Pupils in Key Stage 4 have 8 Science lessons a fortnight that are signposted as Biology/Chemistry/ Physics and are taught by specialist teachers.

Teaching and Learning (including pedagogical approach and research)

The teachers in EYFS follow the interests of the children and so the topics covered vary each year. In 2020, the topics were 'Marvellous Me' 'Our Heroes' 'Once upon a time...' 'Amazing Animals' 'Wildlife Watchers' and 'Let's go on an adventure'. Science lessons fit into topic work. Forest school and outdoor learning happens throughout the year.

Pupils in Year 1-6 have timetabled Science lessons either taught by their normal classroom teacher or by a subject specialist from the secondary phase. Teachers plan each lesson to suit their own class based on objectives from the National Curriculum. Lessons include planning and carrying out experiments, making observations and coming up with conclusions. Science at KS1 and KS2 is taught in discreet Science lessons, however Science units that are related to topics being taught may also be taught alongside topic lessons, e.g. Year 3 doing Stone Age would also study the unit on rocks at the same time. This allows for their understanding of key scientific concepts to be consolidated and also introduces pupils to the idea of the scientific method. Pupils have the opportunity to carry out practical work and also have access to the 'kit boxes' from the Teacher Scientist Network (TSN) which are based at Litcham School. These are boxes that contain the resources for a topic within a box e.g. electricity. These boxes are also bookable resources that the primary schools in our catchment have access to.

Pupils in Key Stages 3 and 4 continue to have a mixture of theory and practical work so that knowledge and skills continue to be taught and developed. Pupils will use increasingly sophisticated apparatus so Year 7 pupils are able to measure with measuring cylinders and year 10 pupils will carry out neutralisation using titration equipment. The Science department use 'Rosenshine's Principles of instruction' to underpin all teaching and learning activities including

- Provide models
- Scaffolds for difficult tasks
- New material in small step

Practical work has a high priority in Litcham School Science lessons and also gives the pupils the chance to work effectively as part of a team. At the secondary phase a specific practical is formally assessed by the teacher at regular intervals and feedback given so pupils can correct and improve their work, thereby improving their skills in metacognition. The Science Department uses marking stickers to give formal feedback. This makes it easy for the pupils to see their strengths and how to improve.

Extra-Curricular

The Science department offers a number of clubs and activities. We are planning a number of enrichment opportunities for this academic year including a trip to the Big Bang Fair, participation in the 'Top of the Bench' competition and a number of activities at both the primary and secondary phase to celebrate National Science and Engineering week in March.

IMPACT

Pupils at the primary phase are encouraged to enquire and ask and answer scientific questions. They answer retrieval questions as regular assessments of their understanding throughout each topic and each curriculum objective is RAG rated to show children's understanding. At the end of KS1 and KS2 children achieve roughly in line with the national average. Pupils in Key Stage 3 and 4 have end of unit tests at the end of each topic. To prepare for this, pupils have a revision lesson where they will consolidate their learning using mindmaps and quizzes. The marks for each class are recorded in a centralised spreadsheet and progress is monitored by the class teacher and Head of Department. Strategies for pupils at risk of underachieving include additional work from the electronic textbook, additional questioning in lessons, a move in the seating plan or careful scaffolding. Parental contact home is made through phone calls and also postcards are sent home for example for an improvement in an assessment. Assessment for learning is embedded in Science lessons and can take the form of traffic light quizzes, hinge point questioning and other formative assessments. 'Core practicals' which form 17% of the GCSE exam, are also assessed formatively with pupils receiving written feedback on these and then having the opportunity in lessons to correct and improve their

work. The majority of pupils achieve expected or above expected progress by the end of KS3 and above the national average by the end of KS4.