

# The Levett School



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Positivity | Determination | Reflection | Integrity

## KS3 Science Policy

<i>Policy agreed by Governors on:</i>	31/01/2023
<i>Review date for Governors:</i>	October 2022
<i>Allocated Group/Person to Review:</i>	Helen Megaw
<i>Agreed frequency of Review, by allocated person:</i>	Every Year
<i>Last Review date:</i>	21/07/2022

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## **Science Rationale**

When setting out the Science curriculum, our objectives are to encourage and support pupils to enjoy science as a subject and to take an interest in the topics they are learning. Curiosity is a wonderful characteristic to keep hold of and we hope our pupils manage to do this whilst with us and in the wider world.

Another objective is to progress well in Science and achieve a level of knowledge that can be used to access Science at GCSE, BTEC and/or Entry Level. At KS3 the student can build on previous knowledge, fill in gaps in knowledge due to a previously interrupted education and learn new topics. The programme of study then derives from the National Curriculum, which is modified to suit each individual student's interests and abilities.

The key areas in our Science curriculum are:

- Developing scientific knowledge and conceptual understanding.
- Developing an understanding of the nature, processes and methods of science, through different types of scientific enquiry that help them to answer scientific questions about the world around them.
- Learning to apply observational, practical, modelling, enquiry, problem-solving and mathematical skills, both in the classroom and where possible in other environments.

The aims of science are:

- To promote learning opportunities which conform to the National Curriculum guidelines.
- To provide a safe, practically based opportunity for controlled curiosity, and to encourage an appreciation of the need for safe and careful action.
- To provide a variety of experiences that allow exploration of their world without requiring complex knowledge of facts, and which allows responses at each pupils' level of ability.
- To be accessible to pupils with a short attention span, through practical areas of Science.
- To involve the pupils and their teachers in promoting ideas and seeking solutions.
- To enhance language and communication through discussion of scientific events.
- To provide an environment which will stimulate both interest and pleasure in Science and will develop, extend and reinforce other areas of the curriculum, e.g. cookery, PE and Technology.

## **Teaching and Learning Style**

Modification to the scheme of work and subject objectives may be made on response to evaluation feedback from individual class teachers. Science is a time-tabled subject, taught by Class Teachers. The teaching and learning approaches used are carefully matched to the learning needs of pupils, taking into account their individual needs, SEN and learning styles. A range of teaching methods are employed, which include teacher presentation and demonstration, group discussion, practical work, problem solving, student presentation, role play, individual work and investigation.

At the start of each lesson, the pupils are given a Big Question. By the end of the lesson the pupils should be able to answer the question from the learning which has occurred during the lesson. These questions are linked to the real world, to establish links between learning within school and things which occur in everyday life.

### **Science Curriculum Planning**

The long-term plan maps out the Science activities covered in each term during the key stage. There is scope for teachers to plan to suit their pupil's interests, current events, their own teaching style, with the use of any support staff and the resources available.

The Science plans are incorporated into the medium term plan. These define what we teach and ensure an appropriate balance and distribution of work across the term. We plan the Science lessons so they build upon the prior learning of the pupils. While there are opportunities for pupils of all abilities to develop their skills, knowledge and understanding in each activity area, there is planned progression built into the scheme of work, so that the pupils are increasingly challenged as they move through lessons.

To optimise pupils' potential, staff think about the Science environment, activities and how they communicate to pupils. They also have to consider safety issues and how to enable pupils with physical disabilities to participate in practical work using manipulatively difficult equipment.

It is advantageous if there is/are:

- An active stimulating learning environment
- Step-by-step activities
- Effective teachers' communication
- Equipment
- Safety
- Support of other adults and organisations
- General background material about pupils with SEN

### **Overview of units of study across Key Stage 3**

	<b>Topics to be covered</b>
<b>Year 7</b>	Cells Reproduction Environment and Feeding Variation and Classification Acids and Alkalis Reactions Particle model Solutions

	Energy Electric circuits Forces Solar system
<b>Year 8</b>	Food and Digestion Respiration Microbes and Disease Ecology Atoms and Elements Compound and mixtures Rocks and weathering Rock cycle Heating and Cooling Magnets Light Sound and hearing
<b>Year 9</b>	Inheritance and selection Fit and Healthy Plants and Photosynthesis Plants for food Reactions of metals Reactivity patterns Environmental chemistry Using Chemistry Energy and electric Gravity and space Speeding up Pressure and moments
<b>Across the curriculum, working scientifically</b>	Knowledge of science equipment and health and safety in the laboratory. The development of scientific thinking. Experimental skills and strategies. Analysis and evaluation. Scientific vocabulary, units, symbols and nomenclature.

### **Assessment and Outcomes**

The curriculum is what we teach pupils and the assessment outcomes are how they show us that they have learnt this.

It is important that we assess pupils to identify what has been learnt, the skills that have been mastered and what needs to improve further. Most importantly, it guides and supports pupils with the next steps in their learning. High-quality assessment can have a very positive impact on pupils' learning and progress.

It is taken into account that pupils attending our trust have missed significant amounts of their previous learning and will have gaps in their KS2 knowledge which may well have reduced their confidence and engagement in the subject. Therefore, the primary aim when meeting pupils is to re-engage and raise aspirations whilst also completing baseline assessments to make sure each student is put onto the most appropriate pathway.

**Baseline assessments are in two parts;**

1. Moderated written assessments.
2. Practical assessment to assess pupils' observational, problem solving and practical skills.

Throughout the course, two forms of assessment are used to track progress and inform practice;

**Summative Assessments** take place at the end of a unit of learning, in the form of a written test or selection of past paper questions. The assessments are awarded, where possible, an Entry Level Certificate or GCSE level to track progress from the baseline. Also including practical assessments during experiments.

**Formative Assessments** take place every lesson either through immediate verbal feedback, written feedback on pupils' work and through self-reflection. Pupils' acquisition and understanding of new information and retention in the longer term are key foci when completing these assessments. RISC activities are used at the end of each lesson as formative feedback and this informs the planning for the following lesson.

Both of the above are used to regularly inform the practice of Science teachers and support staff across the trust. Different learning styles, adapted resources, the use of more links to pupils' lives and a plethora of other teaching techniques can be used to aid student's progress when any problems are quickly identified due to the robust assessment process detailed above, gaps in learning can then be filled.

**Science and the Wider Curriculum**

The Science Curriculum supports the teaching of British Values, SMSC and cultural capital along with supporting a school priority to raise the profile of reading skills and linking to careers and the understanding of life beyond education.

Contribution of Science to teaching in other curriculum areas:

Teachers will seek to take advantage of opportunities to make cross-curricular links. They will plan for pupils to practise and apply the skills, knowledge and understanding acquired through Science lessons to other areas of the curriculum:

- **Mathematics.** Sharing strong links with mathematics – taking measurements (length, time, mass, etc), data handling and presenting data in tables and through the use of graphs and pie charts.

- **ICT.** We recognise the important role computing skills have to play in the development of scientific skills. We also recognise the importance of being computer literate. Computing skills are used on a daily basis to enhance teaching and learning of science and to give all pupils the opportunity to use computing to research, collect, analyse and present scientific findings.
- **Geography.** It shares a 'natural' link with Science and pupils should have every possible opportunity to explore the science present in and around their school environment.
- **History.** To bring in History pupils should have the opportunity to research and learn about famous scientists from history and how their achievements have changed or impacted upon our lives.
- **English.** A Science activity can be used to stimulate pupils to write their own text in the genre about which they have been learning. This approach means that the limited time allocated to science can be used primarily for practical work, as communication of science ideas is covered in the literacy periods.
- **PSHCE Education.** The study in science lessons of reproduction and human development. Such learning both boosts pupil's knowledge of human biology and helps pupils to stay healthy and safe as they grow up. The aim of teaching about this in the primary curriculum is to allow the school and parents to work in partnership to keep pupils knowledgeable and safe as they grow up.

### **British Values and SMSC**

The Science Curriculum at The Levett School is packed with strands of SMSC and British Values, here are some examples;

- Role modelling respect and tolerance between staff and pupils.
- Clear rules for experiments and classroom behaviour.
- Listening to others' opinions.
- Learning to be responsible for our own health.
- Learning to be environmentally aware and responsible and how our individual behaviour and the behaviour of the human race affects our environment.
- Questioning of how money is spent for scientific research.
- Fostering a pride for all the scientific advancements, discoveries or breakthroughs that Britain is responsible for but also respect for amazing work in countries around the world.

Sometimes Science and spiritual ideas do cause conflict but in a modern society it is important to understand why these conflicts arise so we can respect the views of others and move forward. It is also seen more often that Science is able to stand alongside the spiritual beliefs of many. This is looked at often from a neutral stand point within Science lessons

### **Experiencing Awe and Wonder**

- The impact of waves (Tsunamis and Earthquakes) in Physics

- Evolution in Biology
- The Big Bang Theory in Physics
- The development of the periodic table in Chemistry
- The miracle of birth in human biology

### **Exploring the values and beliefs of others**

- The use of stem cells in reproductive research and the cure for inherited diseases
- The morality of blood transfusions for some religious groups
- Genetically modified crops
- The impact of pollution on our planet
- The anti-evolution movement (creationism) Understanding Human feelings and emotions
- The impact of drug misuse
- The impact of alcohol on individuals, families and society
- Human behaviour and psychology

### **Cultural Capital**

As a school, we feel it is extremely important to raise our pupils' cultural capital in order to help them overcome any social disadvantage or adversity that they come up against. Also, to widen their horizons and raise their aspirations to have a bright and positive future. Within the Science Curriculum, there are ample opportunities to do this, such as going on school trips to Yorkshire Wildlife Park, the Deep, Potteric Carr, Sandal Beat Woods and Magna. Also, in lessons, continuous discussion about the wider world and how any science topic can be related to a pupils' life in some way.

Scientific development comes from all across the world, from people of all backgrounds and cultures. Some of Science's most important discoveries have come from other parts of the world and it's important for pupils to understand this as many believe that progress comes largely from the UK or America. It is also important to understand how the different cultures around the world can have different impacts on the planet and what impact more economically developed countries have on poorer areas. This will also be vital into the future as we need to monitor the impact of quickly developing cultures around the world on our environment.

### **Exploring, Understanding and Respecting Diversity**

- Understanding genetic variation
- Plant and animal biodiversity
- Classification and ecology
- Participating in and responding to cultural activities
- Celebrating Space
- Star formation
- Big Bang Theory
- Changing ideas about the universe
- Transplantation

- Understanding and appreciating personal influences
- Celebrating the role Scientists have played in our society.
- For example the influence of:
  - Newton
  - Darwin
  - Mendel
  - Mendeleev
  - Galileo

### **Reading Skills**

Reading Skills are consistently used and progressed within the Science Curriculum as detailed below;

- Researching online and reading a variety of information sources.
- New scientific vocabulary and definitions used regularly within lessons, questions asked about them and activities using them to aid retention.
- Reading and comprehension of practice exam questions and written exam style work. - Reading topic fact sheets to answer questions.
- Reading scientific magazines and comics.
- Scan games, finding key information in a text.
- Word Walls for each year group, rotated to display all the current terminology for the topic being taught.
- Presentation Skills
- Developing speaking skills

### **Links to Careers**

Every topic within the Science Curriculum can be linked to careers and this is done in a variety of ways, such as watching documentaries, discussing job roles, online research, reading magazines and newspaper articles and school trips as mentioned in the Cultural Capital section above.

- Health visitors
- Dieticians
- Surgeons and people who assist surgeons
- Electricity and electricians
- Research
- Transport design
- The space industry
- Genetic engineers
- Lab technicians
- Material science
- Food and flavoring industry



- Nurses
- GPs
- Consultants
- Paramedics
- Forensic Science
- Pharmaceuticals, Pharmacists and drug trails
- Sports Coaches

### **Health and Safety**

Teachers have a general duty to take reasonable care for the health and safety of themselves, of other members of staff and of pupils.

- They must cooperate with the employer's instructions and fulfil any special responsibilities it gives them.
- They must cooperate with colleagues in their specific health & safety duties.
- Staff practice must set a good example to pupils and be consistent with pupil experiment rules, e.g. over the wearing of eye protection.
- Staff must be familiar with emergency drills and with the location in each room of: the escape route and fire-fighting equipment.
- Special arrangements must be made for hazardous equipment which has to be left out.
- Eating, drinking and the application of cosmetics should not take place.
- A teacher must assess risks very carefully before conducting any practical experiment. Pupils must not be left unsupervised in a classroom.
- Lesson preparation should be adequate and include checking on risk assessments and, where necessary, the health & safety precautions required.
- Time should be allowed for consulting more-senior colleagues where there is any doubt and to try out experiments, particularly those involving significant hazards.
- If, because of indiscipline, health and safety cannot be maintained during certain practical work, the work should be modified or abandoned.