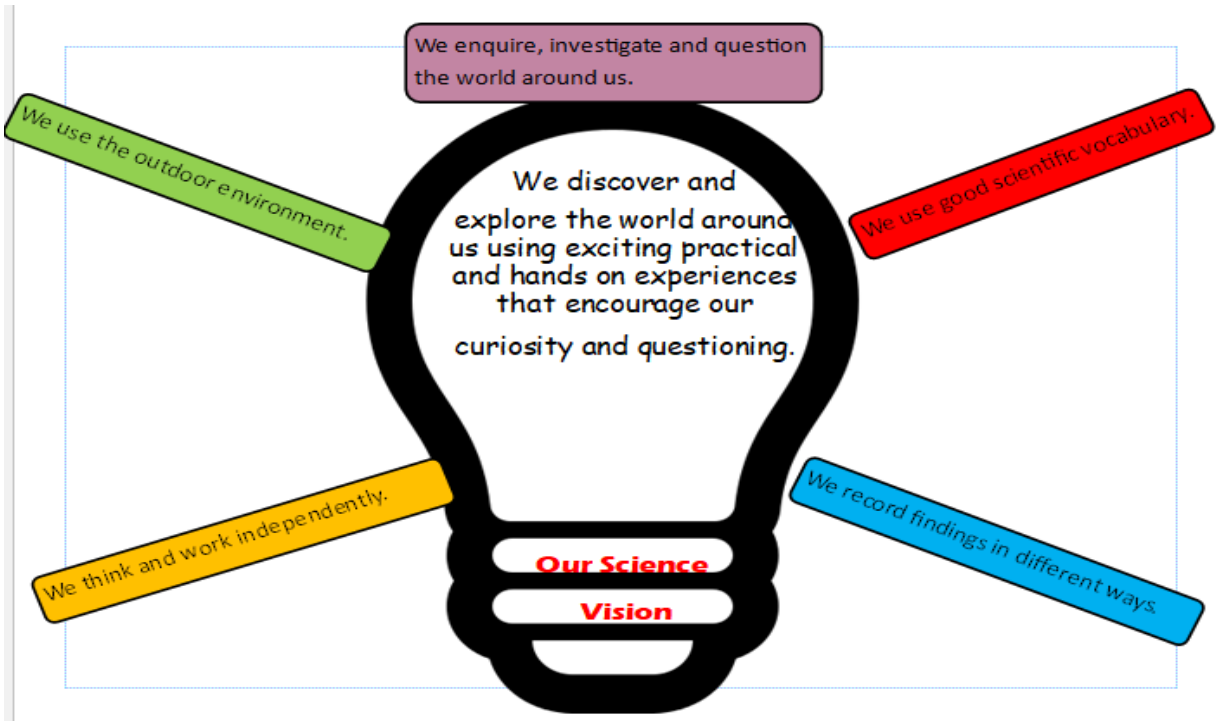
Science Policy January 2021

The vision and key principles of Science at Seven Stars



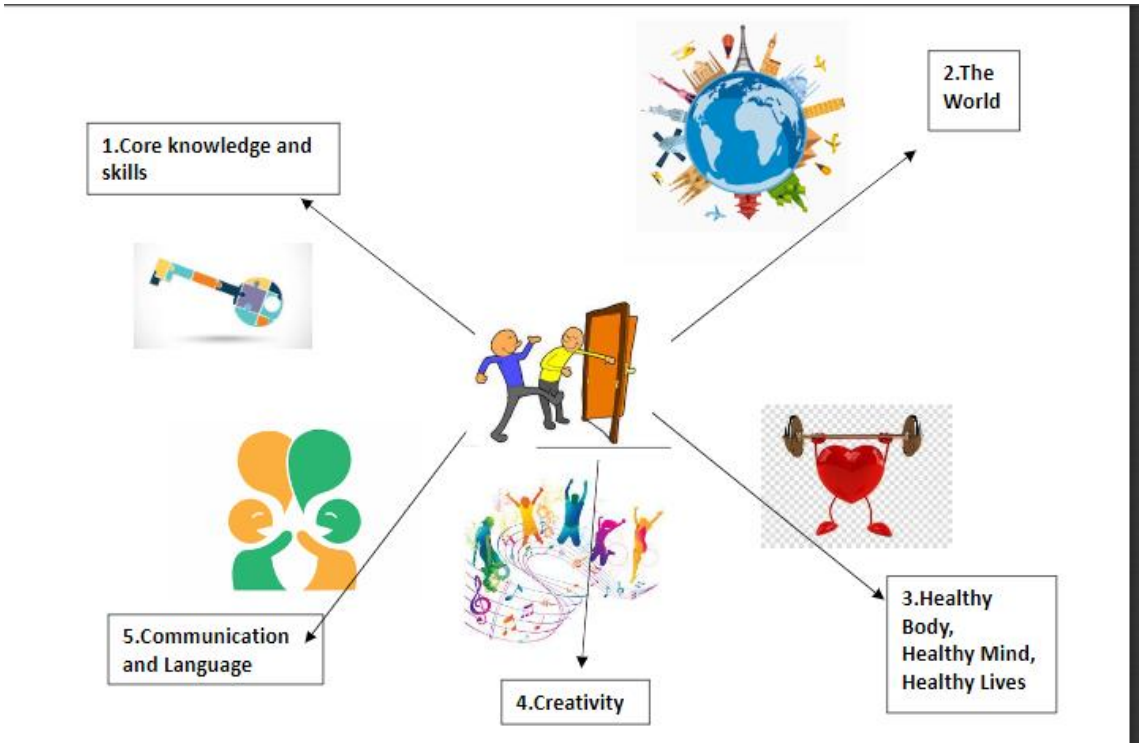
(Discussed and decided by Seven Stars Staff and have become our key principles to be updated yearly 8/7/19)

At Seven Stars Primary School, we consider science as a fundamental part of our broad curriculum. The children use scientific knowledge and key skills, through their enquiry, which is encouraged in every science lesson and extra-curricular activity.

Science stimulates and excites pupil's curiosity about natural phenomena and events in the world around them. Using our key principles and scientific skills we encourage and develop this curiosity by working scientifically. Our children engage regularly in practical science to engage learners at many levels. Through Science, pupils understand how major scientific ideas contribute toward technological change – impacting on industry, medicine, business and improving quality of life. They learn to question and discuss science based issues that may affect their own lives, the directions of society and the future of the world.

1 Aims – Open Doors Curriculum

At Seven Stars we want to open doors for our children that might otherwise be closed in order to provide them with the knowledge, understanding and skills for them to become successful learners who can aspire to a life of flourishing and contribute to the flourishing of others in society.



Opening Doors in Science

1. **Core knowledge and skills**
   The teaching of science knowledge is embedded through practical enquiry and investigation. This hands on approach develops the children's enquiry and investigation skills. We use a number of strategies that makes the knowledge stick and the knowledge and skills progress over the child's time in school.

2. **The World**
   At Seven Stars our children enquire, investigate and question the world around them. From early years through to year 6, our children spend time outside exploring and understanding our environment. We look at the impact of humans on our world and how we can play a vital role in protecting our planet.
   Our classes regularly go on trips, residential and invite visitors in school to get different experiences and perspectives of science in the wider world that they wouldn't normally get.

3. **Healthy body, Healthy Mind and Healthy Lives**

Each year group at Seven stars focuses on the human body and how it works. By year 6 we aim for our children to have a good understanding of themselves and what is going on as they grow and develop.

Science links with both our PE and PSHE curriculum looking at how exercise or lack of affects our body and mind. The children explore how we can keep our bodies healthy thinking about diet, exercise but also what might be harmful to us.

4. **Creativity**
   At Seven Stars we recognise that each children learns and develops as an individual and we all see the world through different eyes. We encourage creativity in science by recording and reporting in a variety of ways using drama, ICT, models and observational drawing. You might find us recording our knowledge on T-shirts, tables or windows! We work practically as often as we can and celebrate new ways of recording and sharing our work.

5. **Communication and language**
   Language is a key element in our scientific knowledge which is why scientific vocabulary can be seen throughout school. We aim for children to be able to think and explain like a scientist. Discussion and questioning is used in every lesson and children are encouraged to use key scientific language in their discussion and explanation.

Teaching and learning

We use a variety of teaching and learning styles in Science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry-based research activity. Children work both individually and in science groups for enquiry and investigation. We encourage the children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They use ICT in science lessons because it enhances their learning. They take part in role-play and discussions, and they present reports to the rest of the class. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in real scientific activities, for example, investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

Teachers use a range of resources to suit a variety of needs. Teachers also support their own CPD in science with support from the subject leader and using the Reach Out online CPD training.

We recognise that in all classes children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- Setting tasks which are open-ended and can have a variety of responses;
- Setting tasks of increasing difficulty (Structuring and scaffolding where needed so all children can achieve this);

- Providing lines of enquiry using What if statements to promote further thinking
- Providing specific resources for learning but also allowing children to choose appropriate resources they would use.
- Using classroom assistants to support the work of individual children or groups of children.
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Home Learning

During circumstances where the children at Seven Stars are required to work from home, it is essential that they have access to a good quality standard of learning on same level that they would receive in class. We provide home learning for Science using the Dojo online platform. On this platform children have access to the required learning and any resources they need for support. This includes links to websites and videos, school videos, documents and PowerPoints. Children are able to respond in different ways by uploading their work into their portfolios. The staff can then respond and assess the work they have completed giving feedback if necessary. Regular contact with children who are working from home is essential. This is done through video conferencing so any extra support on learning can be given.

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Science curriculum planning

The school uses the National Curriculum 2014 for Science as the basis of its curriculum planning.

We carry out our curriculum planning in Science in three phases (long-term, medium-term and short-term). The long-term plan maps the scientific topics studied in each term during the key stage. The science subject leader and curriculum leader works this out in conjunction with teaching colleagues in each year group. In some cases we combine the scientific study with work in other subject areas, especially at Key Stage 1; but most of the time the children study science as a discrete subject.

Our medium-term topic plans give details of each unit of work for each term and the skills that will be assessed. It also shows how the science will link into the topic if applicable. The skills come from the LPDS NC Assessment Materials from Lancashire. The science subject leader and creative curriculum leader looks at and reviews these plans.

The class teacher is responsible for writing the lesson plans for each lesson (short-term plans). These plans list the specific learning objectives and expected outcomes of each lesson.

We have planned the units in Science so that they build on prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit, and we also build progression into the science units, so that the children are increasingly challenged as they move up through the school. One termly topic a year has Science as its main focus. In this case all subjects are planned around the science topic.

The Foundation Stage

We teach Science in early years as an integral part of the topic work covered during the year. As the reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, for example through investigating what floats and what sinks when placed in water. The foundation stage use their own outdoor environment for scientific enquiry.

The contribution of Science to teaching in other curriculum areas

English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in English are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. The children are also encouraged to present the outcomes of their enquiry or investigations to both the class and staff. They develop their writing skills through writing reports and projects and by recording information. The children expand their scientific vocabulary during lessons and use these words in their scientific explanations. This feeds through to non-fiction writing in English lessons.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Children regularly use measures in Science in various units. Through working on investigations they learn to estimate, measure and predict in a practical and meaningful format. They will analyse and compare results over time looking at changes on graphs and charts. They develop accuracy in their observation and recording of events. The children's recording includes data that is analysed in their conclusions.

Personal, Social and Health Education (PSHE) and Citizenship

Science makes a significant contribution to the teaching of PSHE and citizenship. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way people recycle material and how environments are changed for better or worse. Children look at the importance of a healthy diet and how substances can affect our bodies.

Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping the poor or homeless. Science thus promotes the concept of positive citizenship.

The science aspect of changes of our bodies as we grow and develop also links with SRE units for PSHE

Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking, and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet, and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people. Children also look at a variety of scientists but men and women and particularly ones who are currently making significant contributions to the science today.

Science and ICT

Information and communication technology enhances the teaching of science in our school significantly, because there are some tasks for which ICT is particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly in the classroom. Data loggers are used to assist in the collection of data and in producing tables and graphs. Children use ICT to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. Children learn how to find, select, and analyse information on the Internet and on other media.

Science and inclusion

At our school we teach science to all children, whatever their ability and individual needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our science teaching we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this. For further details see individual whole-school policies: Special Educational Needs; Disability Non-Discrimination; Gifted and Talented; English as an Additional Language (EAL).

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom (a trip to a science museum, for example) we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

At Seven Stars we celebrate individual achievement. Gifted and talented children in science are expected to have an independent approach to scientific enquiry. Teachers encourage broader thinking in this subject allowing gifted and talented children to have a deeper knowledge and understanding by taking their own leadership in enquiry and investigation skills.

Assessment for learning

Teachers will assess children's work in Science by making informal judgements during lessons as the learning is taking place. This will be through a number of methods

. Discussion
. Questioning
. Pupils work and responses
. peer assessment
. next steps response

Teachers can then use this for targeted planning and next steps learning. They can give appropriate feedback and the chance for children to reflect on their learning. They will adapt the challenge and pace of the lesson according to the needs of the children. Older children are encouraged to make judgements about how they can improve their own work.

At the end of a unit of work s/he makes a summary judgement about the work of each pupil in relation to the National Curriculum and the subject specific skills from the LPDS National Curriculum Assessment Materials (LCC 2015). The teacher looks at the skills that highlight scientific knowledge, conceptual understanding and working scientifically. The teacher highlights the skills achieved which show whether the child has achieved the expectations for that year group. We use these skills as the basis for assessing the progress of each child, and we pass this information on to the next teacher at the end of the year.

The results of these assessments are shared with parents as part of the child's annual school report.

The subject leader can access evidence of the children's work in each teachers assessment folder, and uses these to demonstrate the expected level of achievement in Science for each age group in the school.

Teachers are supported with assessment through the subject leader, curriculum leader and using the TAPS materials for assessment.

pstt.org.uk/resources/curriculum-materials/assessment

Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store.

Perishable resources such as batteries, ingredients and disposable equipment is replenished yearly. The library contains a good supply of science topic books and computer software to support children's individual research. For Specific science topics, we have topic boxes that contain specific resources for that

theme the class is studying. We also loan library boxes with unit specific books if needed.

The children have access to tablets where they can use apps and websites with scientific content.

Monitoring and review

It is the responsibility of the subject leader to monitor the standards of children's work and the quality of teaching in science. The subject leader is also responsible for supporting colleagues in their teaching, for being informed about current developments in the subject, and for providing a strategic lead and direction for science in the school. The subject leader gives the head teacher an annual summary report in which s/he evaluates strengths and weaknesses in science, and indicates areas for further improvement. The subject leader has specially-allocated time for fulfilling the vital task of reviewing samples of children's work, and visiting classes to observe science teaching. Staff meeting time is also allocated for Science when needed.

This policy will be reviewed at least every two years.

Signed: Mrs S Wheatland

Date: 12/1/21
Reviewed and edited:
Edited to include open doors 7/10/21