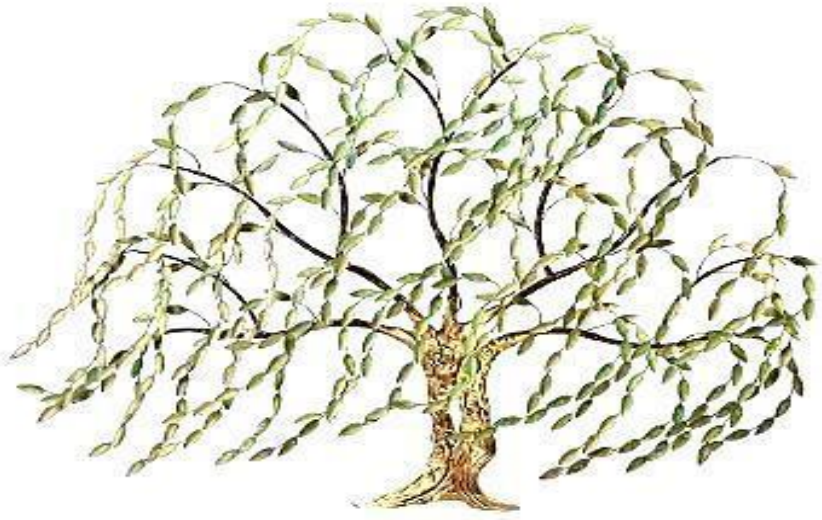

Willow Tree Academy

Science Policy 2020/2021

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Contents:

Statement of intent

At Willow Tree Academy, we understand the importance of science teaching and its pertinence to everyday life. As one of the core subjects, we offer an ambitious curriculum which goes above and beyond the national expectation and exposes children to the real world. As an academy, staff and pupils also work to a set of agreed science principles, which are our core principles of the teaching and learning of science.

1. Legal framework

The 2014 National Curriculum for Science aims to ensure that all children:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- Are equipped with the scientific skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this.

2. Roles and responsibilities

2.1 Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way that they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way in which science will affect the future on a personal, national and global level.

2.2 Our objectives in the teaching of science are for all our children:

- to ask and answer scientific questions;
- to plan and carry out scientific investigations, with the correct use of equipment (including computers);
- to know about life processes;
- to know about materials, electricity, light, sound and natural forces;
- to know about the nature of the solar system, including the earth;
- to know how to evaluate evidence, and to present conclusions both clearly and accurately.
- to understand the term science capital and what it means to them.

Implementation

Teachers at Willow Tree Academy actively involve students in their own learning, teach pupils to develop a conceptual framework as well as to develop problem solving skills. Equally, we promote pupil discussion, collaborative learning and help students experience science in varied, interesting ways, creating positive learning experiences.

3. Curriculum objectives

3.1 Science is a core subject in the National Curriculum. The school uses the national scheme of work for science as the basis of its curriculum planning. The national scheme has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork.

3.2 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 studies in each term during the Key Stage. The science subject 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, other times the children study science as a discrete subject.

3.3 Our medium-term plans, which we have based on the national scheme of work in science, give details of each unit of work for each term. The science subject leader keeps and reviews these plans.

3.4 The class teacher is responsible for writing the daily lesson plans for each lesson (short-term plans). These plans list the specific learning objectives and expected outcomes of each lesson. The class teacher keeps these individual plans, and s/he and the science subject leader often discuss them on an informal basis.

3.5 We have planned the topics 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 scheme of work, so that the children are increasingly challenged as they move up through the school.

4. Subject content

See science progression document:
https://docs.google.com/presentation/d/1Cft4LrgQp0FuVp4jH1HYV79A6QKg0A1ydYPT9lc9lhE/edit#slide=id.g86f47ae4ec_0_55

5. Equal opportunities

5.1 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 and an additional language, and we take all reasonable steps to achieve this. For further details, see individual whole-school

policies: Special Educational Needs; Disability Discrimination; Gifted and Talented Children; English as an Additional Language (EAL).

5.2 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, 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.

5.3 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.

6. Cross-curricular links

6.1 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 the Literacy Hour are of a scientific nature. The children develop oral skills in science lessons through discussions (e.g. of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

6.2 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. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers.

6.3 Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of PSHE and citizenship. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way in which people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping poor or homeless people. Science thus promotes the concept of positive citizenship. Thirdly, science supports the understanding of healthy lifestyles such as healthy eating, hygiene and well-being.

6.4 Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, e.g. 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, alcohol and other drugs 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 in which 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.

6.5 ICT

ICT 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 through the use of IPADS 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.

7. Health and safety

It is our aim to ensure that all children feel safe and secure in science lessons and never come to any harm. All children can ensure this by being sensible at all times and following teacher instructions and the basic school rules. it is the duty of all members of staff, ie, teachers, teaching assistants and other support staff to ensure the safety of our children. To do this we will ensure that children:

- Always stand for practical activities
- Follow instructions carefully during practical activities
- Wash hands following practical activities
- Report spills and accidents to the teacher immediately
- Never leave equipment unattended
- Always wear safety equipment in the correct way
- Keep work area tidy
- Carry equipment safely as directed by the teacher
- Tidy equipment away safely

8. Teaching and learning

8.1 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. 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, e.g.

investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

8.2 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 (we do not expect all children to complete all tasks);
- grouping children by ability in the room, and setting different tasks for each ability group;
- providing resources of different complexity, matched to the ability of the child;
- using classroom assistants to support the work of individual children or groups of children.
- teaching through the medium of numeracy and literacy,
- use of drama for more abstract concepts.

9. Planning

9.1 Science is a core subject in the National Curriculum. The school uses the national scheme of work for science as the basis of its curriculum planning. The national scheme has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork.

9.2 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 studies in each term during the Key Stage. The science subject 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, other times the children study science as a discrete subject.

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10. Assessment and reporting

10.1 Teachers will assess children's work in science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it, and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work.

10.2 Formal assessment will be made at the end of a unit of work using the foundation subject assessment tracker. Subject leader will complete an analysis at the end of each term.

10.3 We report on the progress in science to the comprehensive schools through transition meetings and discussions around the areas of science covered in the curriculum.

11. Resources

11.1 We have sufficient resources for all science teaching units in the school. We keep these in a central store, where there is equipment for each unit of work.

12. Monitoring and review

12.1 The co-ordination and planning of the science curriculum are the responsibility of the subject leader, who also:

- Supports colleagues in their teaching, by keeping informed about current developments in science and providing a strategic lead and direction for this subject;
- Gives the headteacher an annual summary report in which s/he evaluates the strengths and weaknesses in science and indicates areas for further improvement;
- Uses specially allocated regular management time to review evidence of the children's work, and to observe science lessons across the school.

12.2 This policy will be reviewed at least every three years.

Appendices

Science Progression document