

Our Lady Star of the Sea Catholic Primary School

Science Policy

Mission Statements

"You are precious in my eyes"-Isaiah 43

- *Our Lady Star of the Sea Catholic Primary School is committed to the widest and fullest education of all pupils in partnership between home, school, parish and community.*
- *Our school aims to create a happy, ordered environment where all members feel secure, valued and respect each other.*
- *Our school aims to be a positive force within the Catholic church inspired by the life of Christ in the Gospels.*

Aims

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology; a practical way of finding reliable answers to questions we may ask about the world around us. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying their process skills.

We believe that a broad and balanced science education is the entitlement of all children. Our aims in teaching science include the following.

Preparing our children for life in an increasingly scientific and technological world:

- Fostering concern about, and active care for, our environment.
- Fostering curiosity and a questioning mind.
- Nurturing confidence to question and test, to evaluate and reflect natural processes
- Helping our children acquire a growing understanding of scientific ideas and enabling them to work scientifically.
- Helping develop and extend our children's scientific concept of their world.
- Developing our children's understanding of the international and collaborative nature of science.

Attitudes

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work cooperatively with others.
- Providing our children with an exciting experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills

- Giving our children an understanding of scientific processes.
- Helping our children to acquire practical scientific skills allowing them to work, think and process scientifically.
- Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, recording and techniques.
- Understanding and using scientific vocabulary accurately and effectively throughout science lessons and other curricular subjects.
- Developing the use of computing in investigating, recording and researching and becoming fluent when using computing in lessons.
- Enabling our children to become effective communicators of scientific ideas, facts and data.

Our Teaching Aims

We aim to teach science (NC 2014) in ways that are imaginative, purposeful, well managed and enjoyable; giving clear and accurate teacher explanations and offering skilful open questioning. Links between science and other subjects is a feature of practice throughout the school and can be viewed on the Curriculum overviews for each year group. There are four main areas of study:

- Scientific enquiry;
- Life and living processes;
- Materials and their properties;
- Physical processes.

Our role is to teach scientific enquiry through the contexts of the three main content areas. Further to this the children will learn about health and safety in the context of scientific enquiry. Children in the Foundation Stage - the reception class - are taught the science elements of the foundation stage document through the Early Learning Curriculum: Knowledge and Understanding of the World and People and Communities.

How science is structured/planned through the school

Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of the National Curriculum. The teachers work in teams (Foundation, Years 1&2, Years 3&4, and Years 5&6) over these two years a clear balance is achieved between the areas of science, for example: Year 3 studies the physical process topics of magnets and electricity, while Year 4 covers sound and light, similarly Year 3 covers skeletons and digestion, while Year 4 covers plants. The overview of coverage can be seen on the curriculum overviews for each year group and they are available on the school website. Science is generally taught weekly, usually 1.5 hours in Key Stage 1 and for 2 hours in Key Stage 2. However, teachers often block work, so children may experience a whole day, or week or fortnight on a science topic. The teacher will link English, Maths and computing to the science concept(s). Timetables are flexible, allowing all teachers to make creative decisions about lesson delivery, with the aim of maximising the impact of the learning opportunities.

All lessons are planned with a focus on practical scientific enquiry. Planning takes account of the need to place immersion and scientific enquiry at the centre of learning. See appendix one. Here you will find exemplar planning, there is a cyclical design to the plan, firstly pulling the learner in through a “Wow” lesson designed to inspire **awe, wonder and curiosity** then a series of practical activities, through which **immersion and exploration** can take place, leading to a **focused investigation** and a **real outcome**. Teachers currently use the Lancashire science scheme (Inspiring Science), supported by other material sourced by teachers from books and the internet. Inspiring Science outlines creative context through which each scientific topic can be covered. Firstly, the key learning has been separated into ten areas as shown below;

Animals	Health	Plants	Environment	Forces
Material Properties	Material Changes	Light/ Astronomy	Electricity	Sound

These areas are covered in a cycle of learning as mentioned above. For the learning to be Scientific the staff at Our Lady’s recognise that the children need to be provided with opportunities to inspire **awe, wonder and curiosity** about the world around them and to be **immersed** in a scientific concept (e.g. light) in as many different ways as possible through the different types of scientific enquiry. Further to this they need to be provided with an opportunity to **investigate** a phenomena **in some detail** developing investigative skills and problem solving. We also recognise that this learning needs to have **a real purpose** for finding something out and **a real audience** to report their findings to.

Teachers can select learning opportunities from the ‘Creative Contexts’ of the “Inspiring Science” scheme to plan the children’s learning, ensuring they include the main features of the Learning Cycle Plan. It is assumed that medium term plans are a working document and will undergo amendments as children are involved in making decisions about the direction of their learning. The Learning Cycle might go through more than one cycle within a project.

Different types of Enquiry

The ‘Immersion/Exploration’ section of the Learning Cycle Plan covers different aspects of scientific enquiry. Teachers should aim to include as many of the different types of enquiry as possible within a project as these give a **variety** of ways to **immerse** children practically in the area of science that they are learning about. At our Lady’s we recognise that Primary Science should be about **finding out** about the world in which we live, exploring both natural and manmade aspects. The different types of scientific enquiry describe the different ways we can find out. These include:

- Asking and raising questions
- Exploring / Observing / First hand experiences
- Sorting / Grouping / Comparing / Classifying
- Modelling to show alternative ways to represent real science
- Research – asking an expert, asking others, secondary sources,
- Carrying out investigations (fair tests and pattern seeking surveys)
- Solving problems / Science challenges

The different types of Scientific Enquiry provide opportunities for children to **think about, talk about, and do** science linked to the concept that they are learning. Planning for different types of scientific enquiry also encourages teachers to plan for a variety of practical science beyond fair testing. This is beneficial in order to practise and develop skills such as thinking, discussing, questioning, describing, explaining, problem solving, researching, communicating and collaborating as well as more specific science skills such as observing, measuring, sorting and classifying, modelling, planning, doing and reviewing, etc...

Assessment for learning (AFL)

AFL is central to learning and teaching throughout Our Lady's. Teachers skilfully ask open questions and challenge children to quantify answers and to give examples. Children are encouraged to be open and share observations and understanding with their learning partners and with the class. The children's responses are used to plan further lessons. Teachers also mark work. In science written responses are not the main focus of the lesson, practical enquiry is. It is therefore essential that teachers record responses that demonstrate deeper understanding, or, misunderstanding so learning can be moulded to support, challenge or reinforce in the future. Oral feedback and further questioning is a feature of all lessons. Marking follows the marking policy, in science teachers often ask questions in their marking and leave room for a child's response. They also identify what shows understanding, and what is needed to gain a key skill.

Teacher assessments takes place after each topic on a tracker document. The teacher makes a judgement using classroom observations or more formal questioning, to determine whether a child is: entering, developing, secure or secure plus for their age related key learning targets in science. These are indicated through a colour key:

Entering	
Developing	
Secure	
Secure plus	

With older children, teachers in school, may use the code to indicate to the child an area of science they need to focus on. This will be accompanied by support in lessons and through oral and written feedback.

Special educational needs

Within science lesson teachers will ensure that all children receive equal opportunities.

IEP targets may indicate the need to change or modify a science task, practical and written so the needs of the child in question are met. When children show deep curiosity and take their own learning forward, challenges are set; all children are challenged to think deeper. Our expectations do not limit pupil achievement and assessment does not involve cultural, social, linguistic or gender bias.

Equal opportunities

We make links across the curriculum in science and seek to take advantage of multicultural aspects of the subject. We draw examples from other cultures, recognising that simple technology may be superior to complex solutions. In science lessons we support children with English as an additional language in a variety of ways. eg. Repeating instructions, speaking clearly, emphasising key words, using picture clues, playing games, encouraging children to join in. This ensures that lessons are accessible to all.

Books

Children's work is collated in their own individual books. Books across the school reflect the learning taking place within science lessons and contain a range of different methods of recording (for example children's comments, photographs, spreadsheets, enquiry outcomes and investigation work). Children are expected to take pride in every piece of work they complete and their presentation should reflect this.

Review

This science policy will be reviewed by the science curriculum leader and the senior leadership team.

Date for next review of this document 2022

Year 5 Science 2016/17 Circulatory System— The Blood and the Heart Mrs Hotchkiss

Key Learning Curriculum 2014

Pupils should be taught:

Identify and name the main parts of the circulatory system.

Describe the functions of the:

Heart, Blood, Blood Vessels

Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Describe the ways in which nutrients and water are transported within animals, including humans.

Key skills Curriculum 2014

Exploring and questioning: Launch lessons and all practical tasks

Grouping and classifying: Jugs and herrings lessons

Research: Blood and the different parts—note taking: How to take care of your heart posters

Collaborating: Completing heart rate experiments

Planning and testing: Completing—is there a relationship between the heart rate and the level of exercise

Using equipment and measures: Timers and spreadsheets

Considering results and making conclusions: Continuous data collected and a line graph created and then interpreted

Opportunity for extended writing: Explanatory text all about the heart

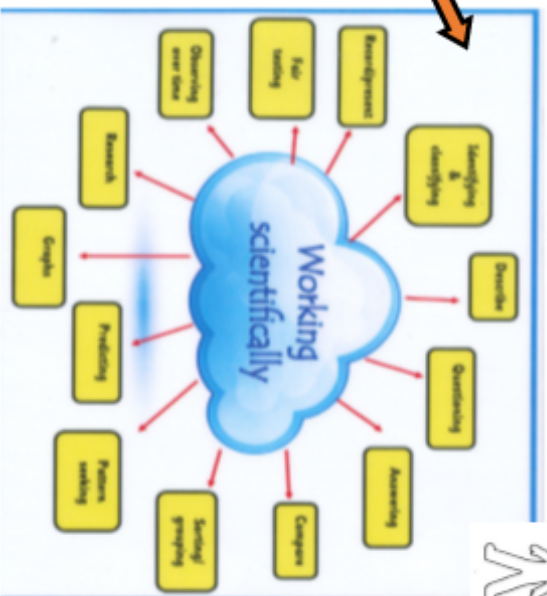
Real outcome reporting to a real audience

Children write an explanatory text about blood

Children produce educational posters about keep your heart healthy

Launch Lesson

The children have a list of idioms about the heart. They then try to find the person in the room with their matching explanation. The children then work in pairs and draw the outside of a body and then draw the internal organs and how they are connected—What do



Have a go / Focused Investigation:

Fair test investigation / pattern seeking surveys
And / Or Science Challenge: Create, invent, design

PLAN Does the about of effort required for exercise affect the heart rate.

DO

REVIEW

Immersion / Exploration Blood/Blood Vessels and the heart

Exploring / Observing / First Hand Experiences:

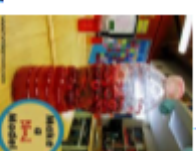
These lessons will be taught during the Health and Happiness week in the summer term: The children will begin the morning answering a general health questionnaire to launch the week before taking part in the science lunch lesson

Health and Happiness Questionnaire	
1. How often do you exercise?	
2. How often do you eat fruit and vegetables?	
3. How often do you drink water?	
4. How often do you sleep well?	
5. How often do you feel stressed?	

Blood: Firstly the children make blood. They learn there are four components and they learn the proportions of each. After this the children watch a video explaining what blood is made of and what each part of the blood actually does:

<https://www.youtube.com/watch?v=VOzKreTNis>

This video is watched twice. The children make notes related to the video so they can write an explanatory text during their next English lesson. See the resources for a notetaking prompt sheet (teacher made).



Teacher teaches about the heart-see PowerPoint on the heart. During this the children have their own photocopied hearts they label these focusing on the chambers and the entering and exiting veins and arteries. The children then go outside and together the class recreates the heart's function. Eight children are the right side of the heart & the right side one the lungs another the body then the children left are the blood cell flowing correctly and changing colour blue to red.

Research: The children work in pairs to research different ways to keep your heart healthy. Together they produce a poster.

Experiment: What effect does ever increasing effort (exercise) have on the heart. The children work in different roles: Tech support, Timer/controller and test subject. The children open a spreadsheet write their aim then their method and then results in the form of a spreadsheet. The children then carry out their experiment and record independently. Conclusions are sought and recorded next to the line graph produced.

Jugs and Herrings lessons delivered by the nurses (2 hours)