

Jerry Clay Academy



Science Guidance Document

Updated September 2022



Policy for Teaching and Learning in Science

Introduction

Science is a core subject within the National Curriculum. This policy outlines the purpose, nature and management of Science taught at Jerry Clay Academy. It reflects the consensus views of all the teaching staff and they are responsible for its implementation.

This policy should be read in conjunction with the New Curriculum 2014 documentation which sets out in detail what pupils will be taught in different year groups as of September 2014.

Vision

'For children, Science is the exploration of the world around them through investigation'

Science is the study of the physical world, involving a collection of facts from observations, physical experiments and working scientifically (Living Processes, Materials, Physical Processes) from which children form ideas of their world.

It is important that children are given the opportunity to explore and understand the world in which they live. Science at Jerry Clay Academy is about giving children the tools to develop their ideas and ways of working that enable them to understand the world through investigation with independence, resilience and enjoyment. This is done with an emphasis on investigation involving prediction, observation, testing and evaluation.

Intent

Aims and objectives of Science education and Jerry Clay Academy

In line with the National Curriculum (2014), we aim to:

- 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 children to answer scientific questions about the world around them
- ensure that children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Implementation

Curriculum Content Provision

The core of the Science provision at Jerry Clay Academy is based on the year-group objectives set in the National Curriculum (2014). Where possible, Science objectives are linked into the topics that children are learning about.

Effective learning in Science:

We use a variety of teaching and learning in science lessons to develop children's knowledge, skills and understanding:

- Sometimes this is 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.
- Children have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs as part of their scientific enquiry.
- Children sometimes use ICT in science lessons where it enhances their learning.
- Children take part in discussions and sometimes 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-life' scientific activities.
- Children are given opportunities to investigate their own questions and how they will investigate. They are given opportunity to choose apparatus (rather than this being specified given this). This allows them to see what works what does not.
- Investigative skills and reports are taught. Classes may sometimes write up each part of an investigation. At other times, they may be focusing in on a certain part.
- Pupils have opportunities to apply their scientific skills in different contexts across the curriculum. They develop enquiry skills useful for science and across the curriculum.

Health and Safety

The school's Health & Safety Policy outlines the safe codes of practice for our school and provides the necessary guidance on the response and the reporting of all incidents.

Children are encouraged to assess hazards and discuss the appropriate precautions. Children are taught the appropriate safe practice when using equipment. This will include:

- How to use equipment correctly and in accordance with health and safety guidelines.
- To behave in a considerate and responsible manner, showing respect for other people and the environment; both in school and on trips outside the classroom.

Equal Opportunities and Inclusion

All children are encouraged to participate in Science lessons regardless of gender or ethnic background. The school will react positively to gender-typical attitudes and encourage the breaking of them.

Our school is committed to the principle that all pupils can access the curriculum to their full potential. Each individual's well-being, needs, education and learning will be met through a broad and balanced curriculum, high expectations and suitable targets, well-trained staff and a sense of belonging.

Therefore, whatever their needs, children will have access to the Science curriculum. Where possible, activities are differentiated or adapted to ensure full participation for specific pupils.

Strategies to support children with SEN

At Jerry Clay Academy, in Science, we use a number of evidence-based strategies to support children with SEN. Strategies include:

Scaffolding

- Support for SEN children with learning vocabulary; this may include flash cards, word mats, word banks
- Visual aids, stories and pictures to support learning
- Hands – on and multi -sensory experiences
- Support in writing sentences eg, missing words rather than writing the whole sentence when doing essay writing

All scaffolding follows a 'I do, you do, we do' approach.

Explicit Instruction

- Pupils may be supported in their thought process in Science
- Pupils will be given specific opportunities by adults to practise specific skills that are barriers to learning.
- Visual aids and concrete examples (where necessary) will be used to support learning.

Cognitive and Metacognitive Strategies

- Tasks may be 'chunked' into smaller steps.
- Visual prompts may be used to aid learning
- Story maps can be used to explain e.g. how our digestive system works
- Depending on ability, children with SEN may be asked to evaluate their own progress and discuss what they can do to move their learning forward.

Flexible Grouping/Fading

- Temporary groups may be established to support learning a particular concept.
- Pre-teaching and support with new learning.

Use of technology

- Tasks set may include useful apps/websites to move learning forward as well as multi – sensory experiences including outdoor areas.

Equipment and Resources

The science leader carries out an annual audit of the resources and re-orders any consumables when necessary. New resources can be purchased through negotiation between class teacher and co-ordinator, within the amount allocated in the annual budget.

All Science resources are stored in labelled trays outside the Year 4 classroom. **It is the responsibility of all teachers to ensure that the trays remain tidy.**

Planning

Class teachers are responsible for the planning and delivery of Science lessons, in line with the National Curriculum (2014) objectives, for their own classes.

Long term planning is produced and saved on the staff shared area at the start of each year and is adapted where appropriate. Medium term planning is completed at the start of each term and displays Science objectives being taught in a particular class, each week. This is then transferred into a teacher's short term plan; a smartboard which clearly states the Learning Objective, Success Criteria as well as key aspects being taught in the lesson.

Early Years Foundation Stage

We teach Science in the Reception class as an integral part of their themed work covered during the year. We relate the scientific aspect of the children's work to the objectives set out in the Early Learning Goals included in Knowledge and Understanding the World.

Vocabulary

Vocabulary for each subject is evident on Unit Overviews and Programmes of Study. This is vocabulary taken from the National Curriculum and other guidance. Teachers will use this in lessons and working walls in classrooms. This is not a comprehensive list, teachers can and should add to this.

Example of vocabulary on Unit Overviews and Programme of Study

Year 1 - Key vocabulary taken from knowledge organisers				
Working scientifically (Working scientifically objectives cover Y1 and 2)	Plants	Animals, including humans	Every Day Materials	Seasonal Changes
<ul style="list-style-type: none"> question answer observe observing equipment identify classify sort group record - diagram, chart, map data compare, contrast describe biology chemistry physics 	<ul style="list-style-type: none"> Plant- A living thing that grows in one place such as an oak tree, a sunflower or a tomato plant. Root- The part of a plant that acts as an anchor, fixing the plant into the ground. They also absorb water and minerals to help the plant to grow. Stem- The part of the plant that grows above the ground. The leaves and flowers grow from it. The stem is also used to transport water and minerals around the plant. Leaves- A plant's leaves absorb sunlight and turn it into energy that the plant uses to grow. seed The small part of a flowering plant that grows into a new plant. Disperse- To spread out over a wide area. deciduous A tree that sheds its leaves during autumn. 	<ul style="list-style-type: none"> Fish- combination of gills, fins and the fact that they live only in the water, make fish different from all other animals Reptile- a cold-blooded animal (as a snake, lizard, turtle, or alligator) Mammal- a mammal is an animal that breathes air, has a backbone, and grows hair at some point during its life. bird -warm-blooded, egg-laying animals that have vertebrae, or a backbone amphibian -a group of cold-blooded vertebrate animals that have gills and live in water before adulthood but breathe air as adults herbivore- something which feeds on plants omnivore something that eats plants and animals Carnivore- something that is a meat-eater Scales- are a small, strong part of an animal's skin which provides protection 	<ul style="list-style-type: none"> Absorbent: able to soak up easily. Stiff: not easily bent or changed in shape Stretchy: able to stretch. Opaque: not able to be seen through. Transparent: able to be seen through. Rough: not smooth or level. Waterproof: keeps out water. Flexible: can bend without breaking. Rigid: unable to bend or be forced out of shape. Opaque: A material that does not let light pass through. Transparent: A material that lets light through and you can see things very clearly through it. 	<ul style="list-style-type: none"> Observe temperature season elements shadows rainfall gauge rainfall precipitation Thermometer Climate Axis Tilt Orbit Sun Fog Rain Snow Warm Cool

Jerry Clay Academy
Subject Knowledge Organiser

Subject: Science (Everyday Materials) Year Group: 1 Term: Autumn

Core Learning of This Unit:

- To describe and compare the simple physical properties of a variety of everyday materials.
- To name a variety of everyday materials, including wood, plastic, glass, metal, brick, paper, fabrics, elastic, foil water, and rock.
- To know the difference between an object and the material from which it is made.
- To be aware of the physical properties of materials such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent.

Prior Learning:

From Foundation Stage:

Knowledge of similarities and differences in relation to objects and materials (e.g. clothes they wear in winter).



Significant People

Revathi S. Kamath is an Indian architect in Delhi. She is a pioneer of mud architecture in India. She is also credited with building the tallest stainless steel structure in India.

National Curriculum Statements:

Pupils should be taught to:

- Distinguish between an object and the material from which it is made.
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Key Vocabulary:

- Absorbent: able to soak up easily.
- Stiff: not easily bent or changed in shape
- Stretchy: able to stretch.
- Opaque: not able to be seen through.
- Transparent: able to be seen through.
- Rough: not smooth or level.
- Waterproof: keeps out water.
- Flexible: can bend without breaking.
- Rigid: unable to bend or be forced out of shape.
- Opaque: A material that does not let light pass through.
- Transparent: A material that lets light through and you can see things very clearly through it.

Assessment

Assessment is in line with the school's Policy. Assessment opportunities are included in the study of each unit of work. Assessments are based on the National Curriculum level descriptors.

Teachers will assess children's work in Science throughout the year. There will be a strong focus on Assessment for Learning (AFL) and children will be encouraged to assess their own work where appropriate. pre planning may support this and guide direction of coming lessons.

Teachers will use different retrieval techniques to check that children remember information and to formatively assess what needs teaching. This may be quizzes, rapid recall, be the teacher etc.

Assessment can be carried out informally during the course of teaching. It enables the teacher to identify a child's understanding and progress in particular aspects, to inform their immediate teaching and to plan for their coming lessons. Likewise, assessments of children's work are carried out after the lesson where the teacher marks a child's work, using the school's marking policy. Work can be followed up during 'Strive Time' in the next Science lesson.

Teachers will complete the relevant Science Assessment pro-forma for the particular unit taught in their year group by highlighting against the expectations (*See below*). This can be found in the front of children's Science books (Tried in Year 2 during Spring 1 2017 then shared with whole staff to use from Spring 2 2017)

Parents are informed of the pupil's progress during parents meetings and in end of year reports.

Links with Other Agencies

These include:

- Communication between 'Outwood Together' cluster schools.
- Communication with 'Change 4 Life' to run schemes in school to promote healthy living (*See PE Policy*).

Impact

The impact of what has been implemented is constantly reviewed by the subject co-ordinator and evidence is recorded in the subject leader file.

Subject Leadership

Science is monitored as part of the Jerry Clay Academy subject leadership monitoring cycle (*See subject leadership file*). Throughout the year, the Subject Leader carries out book studies and will observe lessons through formal observations or drop ins. Through their monitoring of the subject, the subject leader should be confident in leading the subject and assisting staff when needed. The monitoring cycle should be rigorous in Science and should allow the opportunity for staff to receive and act upon feedback given through staff meetings or staff training.



Teaching

Through implementing the key steps identified in the Action Plan, Science should be heightened across the school and children should be confident in talking freely about the subject, what they are currently learning and what they have previously learnt. Teachers should be confident in teaching Science and should be teaching it weekly, identified on LTP and MTP.

Pupils

In ensuring that the points made in the 'Implementation' section of the policy are followed rigorously, pupils enjoyment, and therefore attainment in the subject will be of a high standard. This will be monitored by the subject leader.

Miss J L Karlsson MAT Leave/ Mrs K Longley - Science Subject Leader