Lewknor Church of England Primary School

Science Investigation Policy

September 2024 – September 2026

Christian Vision

Building strong foundations for a happy and successful life

Like the wise man who built his house on rock (Matthew 7:24-27), ewe seek God's wisdom to enable us to nurture our school community so that all can flourish and achieve their best in every aspect of school life.

Rationale

To develop pupil's curiosity, enjoyment, skills and a growing understanding of science knowledge, through an approach in which pupils raise questions and investigate the world in which they live. (This rationale is in common with the school science policy, which this document is intended to run alongside)

Aims

- To teach the National Curriculum for Science effectively across the school
- To provide outstanding coverage of the 'Working Scientifically' strand of the Science national curriculum.
- To develop investigational skills through relevant and practical tasks
- To promote positive attitudes to the learning of science
- To ensure there is a clear progression of skills across the school

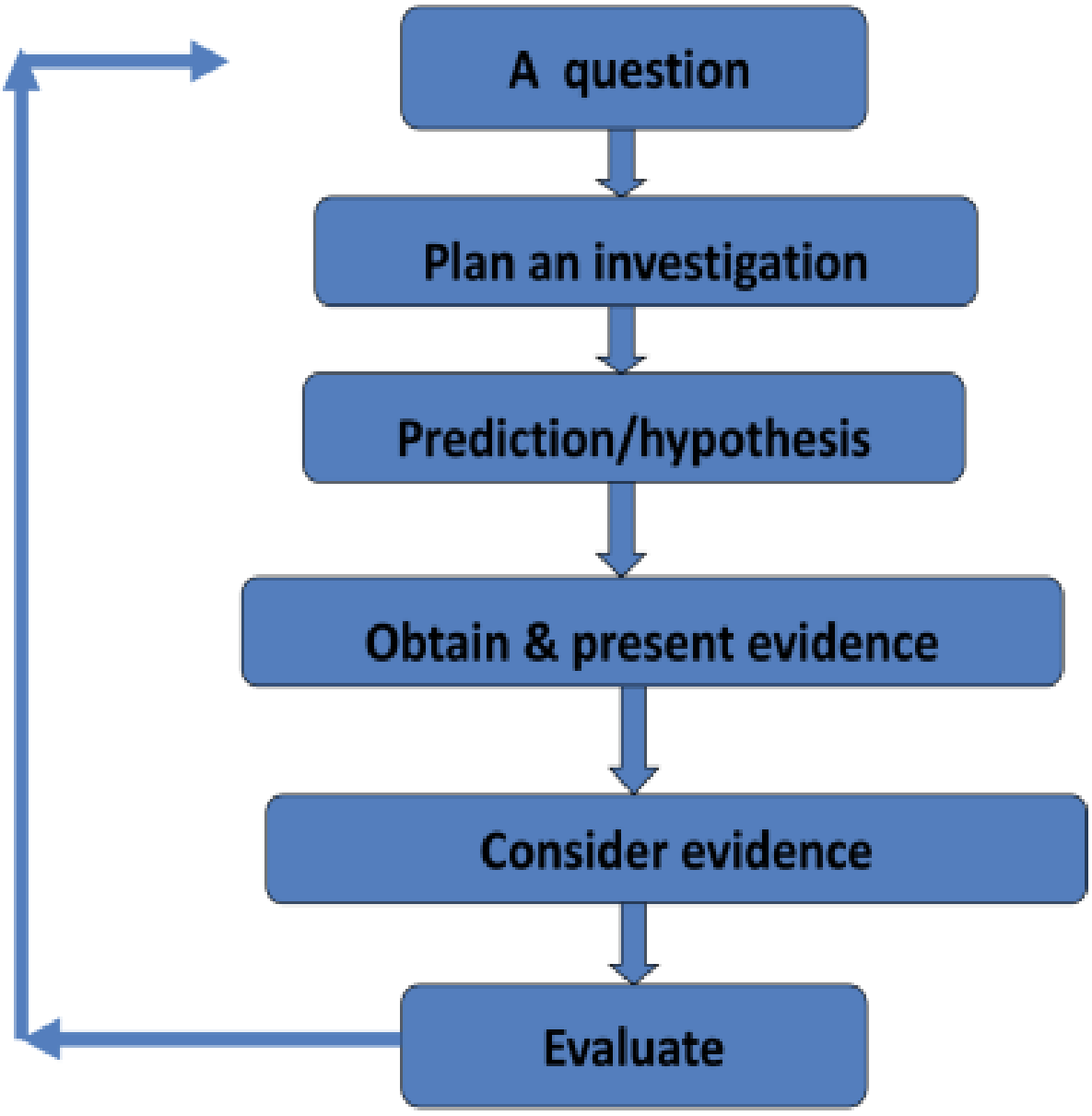
Guidelines

A minimum of one full investigation will be completed in each class each half term.

- Investigations will be clearly planned for in medium term plans.
- Cross curricular links should be made where possible to give investigations a clear and interesting context.
- The guidelines for safety – ASE 'Be Safe' Guidelines are a minimum requirement of health and safety standards. Teachers should notify the science subject leader of any suggested amendments.
- Investigations should be open ended and pupils should be taught to develop increasing independence about how they are going to conduct their investigations.
- Links to skills in other curriculum areas, especially maths, computing and technology should be developed where possible, giving pupils an opportunity to apply their knowledge in other areas.
- Resources need to be cleaned after use and returned.
- Investigations should be marked using the schools marking policy.

The investigation process

All science investigations from the Early Years through to Year 6 should follow the same process, with skills and recording methods being developed as outlined in this document. The model to be used is as follows:



A question – All science investigations need to start with a question. Wherever possible this should be linked to the current Enquiry focus, to a real-life issue or another interesting stimulus. Investigation questions should be purposeful so pupils can put their science learning in a context.

Plan the investigation – This may take the form of a whole class or group discussion where the pupils are given a chance to plan what they are going to do to answer the investigation question. As pupils move through the school this process should become increasingly independent with them taking greater control of the investigation.

Prediction/hypothesis – Once pupils have been given an opportunity to plan the investigation, they should predict what they think is going to happen. Their predictions should be based on their scientific knowledge and explained as clearly as possible.

Obtain and present evidence – Pupils then carry out their investigations and record their results. Lower down the school pupils will need to be taught appropriate methods for recording results and support will be needed for drawing tables and other recording methods accurately. As pupils progress through the school they should take greater responsibility for selecting a recording method which is most suitable for the type of data they are gathering.

Consider evidence – Pupils must be given time to look at and analyse the results that have been collected. Lower down the school this may be as a class discussion in which the teacher supports them in identifying trends, as they get older pupils should have a greater understanding of what their results tell them and be able to use them to draw conclusions.

Evaluate – After the investigation is complete pupils should be given the opportunity to reflect on their learning. They should be able to suggest ways to improve their investigations and identify questions that they may wish to follow up

Science Investigations in Reception

Pupils should:

- Use their senses to practically explore and describe natural materials
- Explore collections of materials with similar or different properties
- Talk about changes to materials
- Plant seeds and take care of plants
- Understand the key features in the life cycle of a plant and an animal
- Recognise the need to care for the natural world
- Explore and talk about different forces
- Recognise some similarities and differences between life in this country and life in other countries.
- Recognise some environments that are different to the one we live in
- Understand the effect of the changing seasons on the world around them

Useful Science Equipment

Magnifying glasses
Beakers
Trays
Measuring jugs
Pipettes
Plastic test tubes
Rulers
Scissors
Tweezers

Investigative Vocabulary

Same
different
why
how
what
predict
investigate
results
conclusion

Resources to support investigations in Reception

http://www.bigeyedowl.co.uk/science/ - various EYFS Science ideas

http://www.education.com/activity/preschool/science/ - quick and easy science activities

50 Summer Science Activities and Experiments for Kids (science-sparks.com)http://www.sciencekids.co.nz/experiments.html - interesting, easy to set up investigations

http://www.bigeyedowl.co.uk/science/ - EYFS Science ideas

Recording Investigations in Early Years

The structure of an investigation should follow the outline described above as closely as possible, starting with a question and giving the children opportunities to plan and carry out their work.

Recording may include:

- speech bubbles, written by adults or children about their predictions
- photographs with annotations of children participating in investigations
- simple tables which children fill in independently or with adult assistance
- speech bubbles to show conclusions that the children have made based on what they have observed
- as children move through reception they may be able to write simple, short sentences giving instructions for setting up an investigation.
- pictures could be sequenced to show what the children have done.

Some investigations may be recorded as a whole class, either in a display or a floor book with contributions from all children (through speech bubbles and photographs) that show the investigation following the different stages.

Individual recording of investigations should begin in Reception as when children are able to write simple sentences independently to explain what they have done. To minimise long writing children could write part of the experiment, for example the conclusion to go alongside an adult scribed prediction and a photograph of what they have been doing.

The expectation is that there is evidence of all children having participated in an investigation every half term.

Science Investigations in KS1

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

Useful Science Equipment

Magnifying glasses
Beakers
Trays
Measuring jugs
Pipettes
Plastic test tubes
Rulers
Scissors
Tweezers
Egg timers
Microscope
Keys for classification
Balancing scales
Tape measures

Investigative Vocabulary

observe
data
identify
classify
fair test
predict /hypothesis
investigate
results
conclusion
same
different
why
how
what

Resources to support investigations in KS1

http://www.schoolscience.co.uk/primary/resources

Pzaz Science

Activities - Explorify – lots of activities to help develop enquiry skills

www.saps.org.uk – Schools and Plants

Primary science teaching resources for 4-7 years | RSC Education – Royal Society of Chemistry

Recording Investigations in Year 1 and 2

- Depending on the needs of individual children, at the beginning of Year 1, it may be necessary to use some of the recording strategies used in EYFS to ensure that children have the opportunity to effectively record their investigations.
- Recording should take place as they investigation is going on to minimise the need for extended writing at the end of the investigation.
- Sections of recording should be modelled to the children so that they know how to present information in their books.
- Although writing frames may be necessary at times, the need for these should be questioned, and where possible children should be recording their work independently in their books. For children who need to build up their writing stamina it may be that they record only part of the investigation themselves and then have support from an adult to complete write up. It is important that children have the opportunity to finish recording, with or without adult support, because they need to be able to show their developing scientific knowledge.
- Where necessary tables may be printed in advance for children to complete as this is a skill that needs to be taught and it can be very time consuming for young children to draw accurate tables.
- The format recording an investigation can be developed throughout KS1 – subheadings that could be used are – Question (what are they investigating), Prediction, Method, Results, Conclusion.

Science Investigations in LKS2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings

Useful Science Equipment

Magnifying glasses
Beakers
Trays
Measuring jugs
Pipettes
Plastic test tubes
Rulers
Scissors
Tweezers
Egg timers
Microscope
Keys for classification
Precise scales
Tape measures
Thermometers
Data loggers

Investigative Vocabulary

comparative test
systematic
evaluation
similarities
observe
data
identify
classify
predict/hypothesis
same
different,
why
how
what
charts
graphs
tables

Resources to support investigations in LKS2

http://www.schoolscience.co.uk/primary/resources
Pzaz Science
Activities - Explorify – lots of activities to help develop enquiry skills
www.saps.org.uk – Schools and Plants
Primary science teaching resources for 4-7 years | RSC Education – Royal Society of Chemistry
www.stem.org.uk – A broad range of curriculum based science investigations

Recording investigations in Year 3 and 4

- Recording should take place as the investigation is going on to minimise the need for extended writing at the end of the investigation.
- Sections of recording should be modelled to the children so that they know how to present information in their books.
- For children who need to build up their writing stamina it may be that they record only part of the investigation themselves and then have support from an adult to complete the write up. It is important that children have the opportunity to finish recording, with or without adult support, because they need to be able to show their developing scientific knowledge.
- Tables may be printed in advance in some circumstances, but it is important that children are taught how to setup their own tables and draw them accurately.
- Children should have the opportunity to display their work in other ways such as bar charts and diagrams.
- Children should be familiar with the expectations for recording an investigation from KS1. Once children are confident with the expectations of what needs to be included, they should start to take greater responsibility for presenting their work in a style of their choice.

Science Investigations in Year 5 and 6

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

Useful Science Equipment

Precise use of scientific equipment including test tubes, syringes, Newton meters
Ability to make choices from a range of equipment they are used to using.
Magnifying glasses
Beakers
Trays
Measuring jugs
Pipettes
Plastic test tubes
Rulers
Scissors
Tweezers
Egg timers
Microscope
Keys for classification
Precise scales
Tape measures
Thermometers
Data loggers
Chrome book apps to record

Investigative Vocabulary

controlled environment
variables – independent and controlled
trust in results
hypothesis /predict
comparative test
systematic
evaluation
similarities
observe
data
same
different
why
how
what
investigate
results
conclusion
evaluation
charts
graphs
tables

Recording investigations at Year 5 and 6

- Children should be taking increasing responsibility for deciding how their investigations are going to be presented. They should have a good understanding of what needs to be included and the expectations for presentation.
- Recording should take place as they investigation is going on to minimise the need for extended writing at the end of the investigation.
- Individual sections of the investigation, for example how to draw scatter graphs, should be taught separately throughout the science unit so that children are familiar with these presentation methods when they come to write up their own investigation.
- Children should be confident to write independently themselves. Where children have additional needs adult support should be given to ensure that children have the opportunity to record in a way which shows their scientific knowledge.
- Children should be increasingly confident drawing tables to display their work neatly and effectively.
- Children should have the opportunity to display their work in other ways such as bar charts, scatter graphs, line graphs and diagrams. They should have increasing independence as to which method is going to be most effective for the data they have collected.

Science Resources Available in School

The UKS2 science cupboards are well equipped with resources which are available for use in lessons. In addition to the boxes for different areas of science the following investigative resources are available.

Timers
Stopwatches
Scales
Sieves
Beakers
Measuring jugs
Thermometers
Test tubes and racks
Weights
Newton meters
Syringes
Models of body parts
Respiration system
Glass slides
30x pairs of safety goggles
Plant cell model
Finger pulse oximeters
Petri dishes
Tape measures
Crocodile clips
Bulbs
Buzzers
Batteries
Switches
Torches
Mirrors
Microscopes

Please ensure that all equipment is cleaned and returned ASAP.