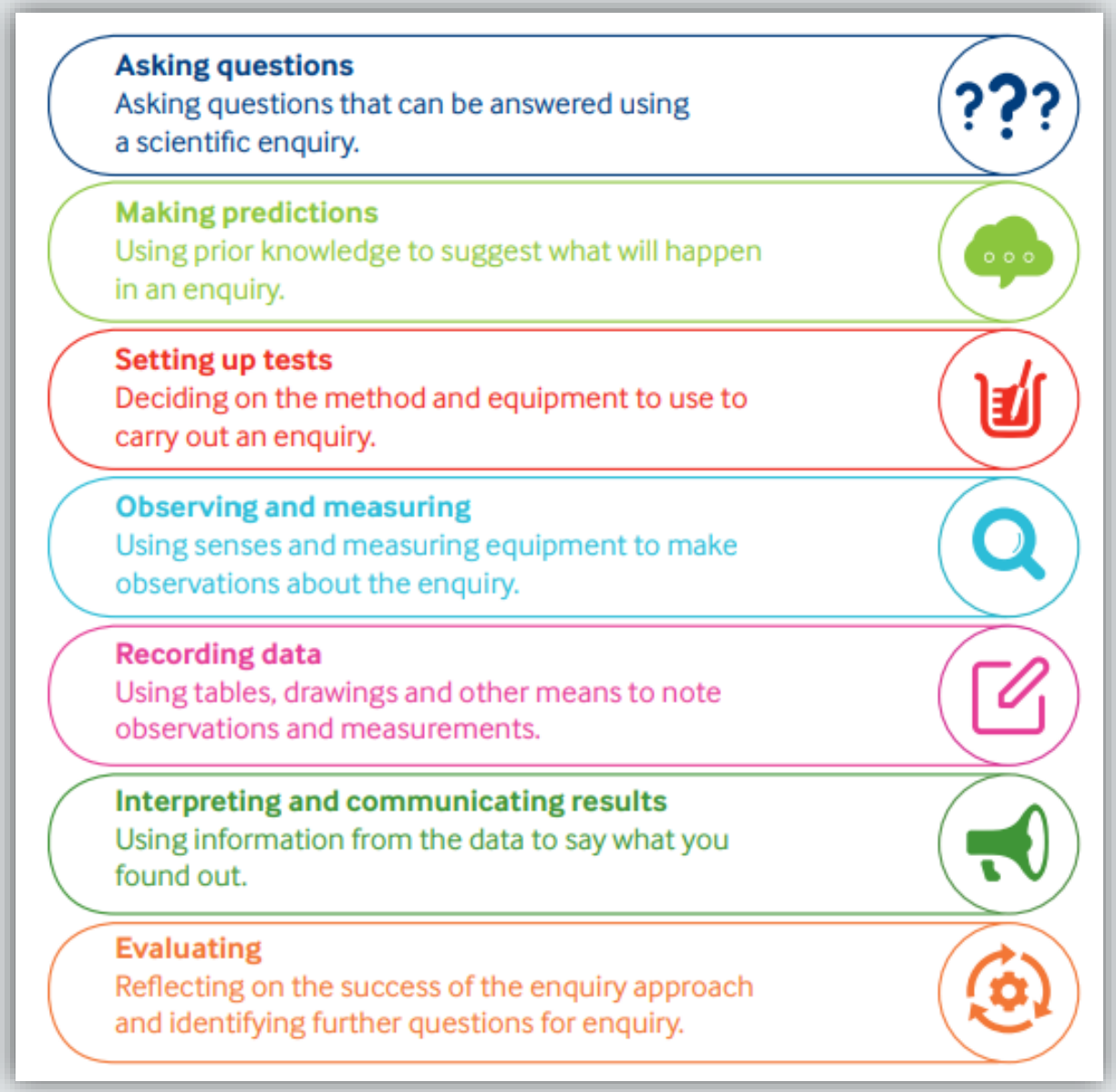
Science Skills Progression (Disciplinary Skills)

Elmhurst School

D. Hanwell - Version 1

Science Skills Progression



There are three aims in the English primary science curriculum, to ensure that all pupils:

- 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 knowledge required to understand the **uses and implications** of science, today and for the future.

These learning journeys provide progression to support the second of these aims.

In order for primary school children to operate as successful scientists, they should be taught a wide range of essential enquiry skills. These skills should build upon earlier opportunities they have had to play, explore, create, engage in active learning, and think critically in the Early Years Foundation Stage.

All types of science enquiry skills can be recorded by the teacher in a floor book.

ASKING QUESTIONS

Asking questions that can be answered using a scientific enquiry.

Transition to Year 7

Year 6

- Explore ideas and ask own questions about scientific phenomena.
- Plan different types of scientific enquiry to answer questions.
- Decide which variables to control.
- Make predictions based on scientific knowledge and explain why confidently.

Year 5

- Begin to explore ideas and ask my own questions about scientific phenomena.
- Begin to plan different types of scientific enquiry to answer questions.
- Begin to decide which variables to control.
- Make predictions based on scientific knowledge independently

KS2

Year 3

- Ask some relevant questions about the world around us.
- Use some different types of scientific enquiry to answer questions.
- Begin to decide which type of enquiry is best to answer my question.
- Make a simple prediction using my prior scientific knowledge and understanding

Year 4

- Ask relevant questions about the world around us.
- Use different types of scientific enquiry to answer questions.
- Begin to decide which type of enquiry is best to answer my question.
- Make simple predictions and give an explanation based on my everyday experiences and knowledge

Year 2

- Ask simple questions about the world around us.
- Begin to use different types of enquiry to answer questions.

Year 1

- Ask a few simple questions about the world around us.
- Recognise that questions can be answered in different ways.
- Begin to use some different types of enquiry to answer questions.

KS1

Reception

Nursery

- Being curious and starting to ask questions.
- Asks questions about aspects of their familiar world.

EYFS

ELMHURST SCHOOL
ASPIRE. CREATE. THINK.

MAKING PREDICTIONS

Using prior knowledge to suggest what will happen in an enquiry.

Transition to Year 7

Year 6

- Make predictions based on scientific knowledge and explain why confidently.
- Base predictions on findings from previous investigations.

Year 5

- Make predictions based on scientific knowledge independently

Year 4

- Make predictions and give a reason using simple scientific vocabulary.

KS2

Year 3

- Make a simple prediction using prior scientific knowledge and understanding to give a reason about the prediction.

Year 2

- Begin to make predictions with support.

Year 1

- Begin to say what might happen in an investigation.

KS1

Reception

- Prediction - a simple guess – what might happen?

Nursery

EYFS

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ASPIRE. CREATE. THINK.

SETTING UP TESTS

Deciding on the methods and equipment to use to carry out on enquiry.

Transition to Year 7

Year 6

- Select and plan the most suitable line of enquiry in a variety of comparative and fair tests.
- Set up a range of comparative and fair tests.
- Explain which variables need to be controlled and why.
- Suggest improvements to the test, giving reasons

Year 5

- Sometimes set up a range of comparative and fair tests.
- Begin to explain which variables need to be controlled and why.
- Begin to suggest improvements to the test, giving reasons.

Year 4

- Set up simple practical enquiries. Including comparative and fair tests.
- Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables.

KS2

Year 3

- Discuss enquiry methods.
- Describe a fair test and recognise when a simple fair test is necessary independently.
- Set up some simple practical enquiries.
- Begin to help decide which variables to keep the same and which to change

Year 2

- Do things in the correct order when performing a simple test.
- Begin to recognise when something is unfair.

Year 1

- Follow instructions to complete a simple test individually or in a group.

KS1

Reception

- Generating a variety of ideas for testing (not always realistic/ appropriate).

Nursery

EYFS

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ASPIRE. CREATE. THINK.

OBSERVING AND MEASURING

Using senses and measuring equipment to make observations about the enquiry.

Transition to Year 7

Year 6

- Make a series of accurate measurements adequate for the task independently and confidently.

Year 5

- Make a series of measurements adequate for the task.

Year 4

- With increased accuracy, I can use standard confidently measure to the nearest whole or half unit or mixed units.

Year 3

- Use standard measures and confidently measure to the nearest whole or half unit.

KS2

Year 2

- Say what happened in an investigation

Year 1

- Begin to say what happened in an investigation.
- Begin to identify and classify.

KS1

Reception

- Using senses to observe and look closely
- Looking closely at things and noticing changes
- Talk about similarities and differences
- To use non-standard units of measure.

Nursery

EYFS

RECORDING DATA

Using tables, drawings and other means to note observations and measurements.

Transition to Year 7

Year 6

- Choose the most effective approach to record and report results, linking to mathematical knowledge.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar graphs, line graphs
- Confidently use the correct scientific language when appropriate.

Year 5

- Begin to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar graphs, line graphs.
- Begin to choose how best to present data.
- Use some scientific language in work.

Year 4

- Collect data in a variety of ways, including labelled diagrams, bar charts and tables.
- Help decide how to record data.
- Use some scientific language in my work.

Year 3

- Begin to collect data in a variety of ways, including labelled diagrams, bar charts and tables.
- Begin to help decide how to record data.
- Begin to use some scientific language in work.

KS2

Year 2

- Collect simple data.
- Record data in a table that the teacher has provided.
- Communicate findings in a variety of ways.

Year 1

- Observe close.
- Begin to collect simple data.
- Begin to record data in a table that the teacher has provided.
- Begin to communicate my findings in a variety of ways.

KS1

Reception

- Making simple records of what I notice or how things change.
- To use simple comparative language e.g. smaller/bigger.
- To record ideas simply e.g. pictures/images.

Nursery

EYFS

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INTERPRETING AND COMMUNICTAING RESULTS

Using information from the data to say what you found out. .

Transition to Year 7

Year 6

- Draw valid scientific, causal conclusions using the results of an enquiry to justify ideas.
- Explain conclusion using scientific knowledge and understanding.
- Identify scientific evidence that has been used to support or refute ideas or arguments.
- Distinguish between opinion and facts.
- Use my findings to set up further enquiries.
- Begin to use abstract models to explain ideas.

Year 5

- Begin to draw scientific, causal conclusions using the results of an enquiry to justify ideas.
- Begin to explain conclusions using scientific knowledge and understanding.
- Begin to distinguish opinion and facts.
- Begin to use findings to make predictions and set up further enquiries.
- Begin to use abstract models to explain ideas

KS2

Year 3

- Begin to draw simple conclusions based on the results of an enquiry.
- Begin to answer own questions using the results of an enquiry.
- begin to use findings to make new simple predictions, suggest
- improvements and think of new questions.

Year 4

- Draw simple conclusions based on the results of an enquiry.
- Answer own questions using the results of an enquiry.
- Use findings to make new simple predictions, suggest improvements and think of new questions.
- Begin to think of cause and effect in explanations.

Year 2

- Talk about what I have found out to suggest answers to questions.
- Explain how I carried out my enquiry.
- Van suggest simple changes to my enquiry.

Year 1

- Begin to talk about what I have found out.
- Begin to explain how I carried out my enquiry.
- Begin to suggest simple changes to my enquiry.

KS1

Reception

- Simply talking about what has been done and noticed

Nursery

EYFS

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EVALUATING

Reflecting on the success of the enquiry approach and identifying further questions for enquiry.

Transition to Year 7

Year 6

- Identify and explain causal relationships in data and identify evidence that supports or refutes findings, selecting fact from opinion.
- Make practical suggestions about how working methods could be improved.
- Use results to identify when further tests and observations might be needed.

Year 5

- Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.

Year 4

- Identify, with help, changes, patterns, similarities and differences in data to help form conclusions.
- Use scientific evidence to support findings.

KS2

Year 3

- Gather, record and use data in a variety of ways to answer a simple question.

Year 2

- Identify simple patterns and/or relationships using simple comparative language.

Year 1

- Use every day or simple scientific language to ask and/or answer a question on given data.

KS1

Reception

- To begin to say what went well when they try
- things out.

Nursery

EYFS

ELMHURST SCHOOL
ASPIRE. CREATE. THINK.

VOCABULARY

Vocabulary relating to working scientifically

Transition to Year 7

Year 6

- hypothesis
- variable
- constants
- evaluate
- plan
- conclude
- interpret
- classify
- categorise
- database
- enquiry
- control
- repeat
- support
- refute
- degree of trust
- scatter graph

Year 5

- classify
- interpret
- pattern
- relationship
- prediction
- analyse
- interpret
- conclude
- evaluate
- rank
- variable
- constants
- control
- repeat
- key
- relationship
- line graph

Year 4

- similarities
- differences
- research and source
- scientists
- discovery
- process
- cycle
- measurements
- conclude
- evaluate
- rank
- plan
- vary
- keep the same, constant
- bar graph
- table
- tally

KS2

Year 3

- gradually
- identify
- observe
- recognise
- investigate
- record
- units
- table
- fair
- evidence
- research
- length
- observations
- Prediction

Year 2

- observe
- change
- slowly
- quickly
- describe
- name
- identify
- label
- record
- measure
- bigger smaller
- pattern
- notice
- cycle
- predict

Year 1

- What…?
- How ….?
- Why …?
- similar
- different
- best and worst
- change
- plan
- look
- compare
- sort and group
- biggest and smallest

KS1

Reception

- experiment
- fair
- find out
- explain
- reason
- Why… ?
- Change

Nursery

EYFS