Science Investigation Policy

Name of Policy: Science Investigation	**Version/Last Review Date:** May 2016
Documents linked to policy: Curriculum Map Year Group Long Term Plans Debvelopment Matters Welsh Foundation Stage Curriulum International Primary Curriulum End of KS Expecations http://www.cleapss.org.uk/ http://www.ase.org.uk/resources/primary/ Be Safe (Ase)	**Previous review date:** June 2013
Other Policies linked to this policy:	**Next Review Date:** May 2019
Governor Committee Responsible	Curriculum/Research

WNA Vision: All children will achieve their full potential, with holistic support, whilst enjoying and driving their own learning, gaining self-respect, self-esteem and self- belief. Our classroom extends to rich, exciting environments within the forest, the beach, the city and the community as a whole.

Science Investigation Policy

All children (Y1 -6) should take part in at least **6 fair test investigations per year**. These should include fair test investigations **and** pattern seeking investigations (**pattern seeking** can never be a fair test – see appendix 1).

This approach will hugely benefit assessment in science and will make the use of assessment much easier.

The plan laid out below is a guide for teachers to follow and is an example of good practice which should be followed.

Planning an investigation.

When planning an **investigation**, it is important to take the following into account:

- Experiment. Go through the experiment as a phase in planning, coming up with all the possible ways it could be done (all the different variables you could have, all the different measurements you could do and your predictions).
- Equipment. Ensure the equipment works and that there is enough of it before you plan it – this gives the science coordinator time to order spares if necessary.
- Health and safety is also an important aspect to consider. For all health and safety queries please refer to the 'Be Safe!' booklet, located in the staff room.

Children in Year 1

Below is a list of what is expected from a child who is either at L1 or is working towards L1.

- We are trying to find out…
- We will compare…
- We think that…
- We found out…

Children need to be given time to talk, observe and explore the materials that are part of the experiment.

They should be given time to observe what has happened and try explaining their observations e.g. "I can see that the water has turned red."

They should **not** be expected to explain **why** they think certain reactions have happened, **nor** should they be expected to **explain** anything using **scientific language**.

However, their own ideas and general knowledge expressed in age appropriate language is acceptable.

Children in Year 2/3

Below is a list of what is expected from a child who is either at L2/L3.

- Our question is…
- We will change…
- We will measure/observe…
- To make this a fair test we will keep these things the same…
- We predict…because…
- Table of results
- Attempt a graph to display results

Children should be given time to talk, observe and explore the equipment that are part of the experiment/investigation.

In Year 1 and 2 they should explain what they can see/hear/smell/feel happening and begin to describe how this is happening e.g. "I can see that it has turned the water red. It started by just turning a little bit red at the top but now all of the water has gone red because the red has sunk."

At a more advanced level or in Year 3 they should complete the above and try to give an explanation as to why this may have happened e.g. "I can see that it has turned the water red, but it turned it red slowly and started at the top. Now it is red everywhere and the bits of tea are at the top and the bottom. I think this has happened because the water has made the bits of tea heavier so they have sunk to the bottom and that is why the red colour has spread."

The use of scientific language is still sparse, however their explanations are becoming more in depth and slightly more scientific.

Children should be taught to 'post-it plan' (see appendix 2) as a whole class/group, led by the teacher. All children may join in, writing suggestions on post-its which are to be collected by the teacher. This can then be photocopied for books or written up by the children, depending on their ability and time constraints.

Children in Years 4, 5 and 6

Below is a list of what is expected from a child:

- We are investigating…
- The variables we could change…
- The variables we could measure/observe…
- Our question is…
- To make it a fair test we will…
- Our predictions are…
- Table of results
- A graph
- Which prediction most closely supports the results?
- Can you explain why using scientific language?
- Are their any unusual results/anomalies? Can we explain why?
- Have we answered the question?
- Our conclusion is…
- How could we improve our investigation?
- How could we change the plan to get better results?

Children should be taught to use the 'post-it' planning approach in groups (they will have completed this as a whole class previously).

For **children in Year 4**, much of this could be photocopied therefore minimising the need for children to copy from the sheet. However, they will need to draw their own, labelled, diagram to show what experiment they did, create their own graph and write up the review section themselves.

Children in **Years 5 and 6** should be given the freedom to select how they wish to present their write up (as part of APP) but should still be expected to include all of the headings **and** take part in 'post-it planning' in groups.

Additionally, the use of scientific language in their explanations should become more evident e.g. "I can see that the water has turned red. This started slowly towards top of the cup but has now **filtered** through all the water. I think this has happened because the tea **particles** have **absorbed** the water and therefore have become **more dense** and have sunk. That has then caused the water to become a deeper red.

SEN and G&T

Children with special educational needs should still be included and expected to join in as much as possible. They will need to have the activities appropriately differentiated for them, but still be included in whole class investigations. This can be done by:

- Setting fewer expectations e.g. they must only explain their observations, not why they think it happened.
- Photocopying group work and using an adult to write out what the child thinks.
- Working in mixed ability pairs, having a higher ability child do the recording with a mix of ideas on it and then photocopy.
- Taking photos of the experiment for the child to label as opposed to them drawing a diagram.
- Place yourself or TA with a smaller SEN group and go through the experiment more slowly.

Children who are considered gifted and talented need appropriate challenge. For children who are in KS1, this can come in the form of further expectations (from the next phase). For children at the top end of the school, this can be done by:

- Asking them to resource their own experiments (what will they need?)
- Posing them a question and leaving them to discover the answer, planning the experiment on their own.
- Using further scientific language e.g. not just variable but independent/dependent variable or hypothesis.

We are trying to find out

……

We will compare…

We think that…	We think that…	We think that…	We think that…

We found out…

Our question is…

Change

We will change…

We will measure/ observe…

We predict…

because…

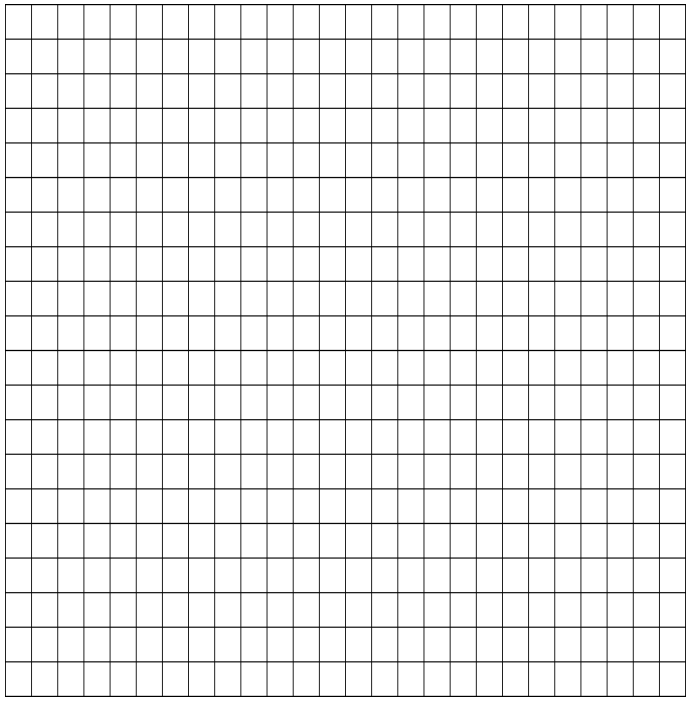
We predict…

because…

Table of results	
We will change	We will measure/observe

Measure

Our graph…



We found that…

Glossary

Anomalies – unusual/irregular result/s in an experiment.

Conclusion – what happened in the experiment.

Control variable – all the variables which remain the same in an experiment.

Dependent variable – the measurement of your independent variable e.g. if you are measuring how a plant grows in response to the amount of light it receives. Your dependent variable is the growth in the plant.

Diagram – a labelled picture of the experiment.

Fair test – an experiment in which only one variable is changed, everything else remains the same.

Hypothesis – prediction.

Independent variable – the variable that is changed in an experiment.

Investigation – an examination in order to discover facts to answer a question.

Pattern seeking – an experiment that can never be a fair test e.g. can people with a larger hand span pick up more multilink? This can never be a fair test due to the different ways in which the children can 'grab' the multilink/the strength of their grip.

Prediction – what you think may happen in an experiment before you complete it.

Variable – everything that you could change in an experiment e.g. in an experiment about plants growing effectively you could change the amount of water, light, plant food, seeds the plant receive