

I love  
Science!

# Cambo First School

## PSQM

### GILT Award

Sunday has  
turned into  
Science day in  
our house!

When are we  
doing science?

I wish science  
was like this  
when I was at  
school!

I am amazed at the  
progress the  
children are making  
in relation to their  
working  
scientifically  
objectives and  
vocabulary



I feel like I am  
clearer how  
to approach  
teaching  
science now.

What science can we  
do this weekend?

Can we do another  
assembly to talk  
about science?

When I say we are  
going to do  
science everyone  
cheers!

## Key

Red type-  
parents,  
governors  
community  
comments

Blue type-  
children's  
comments

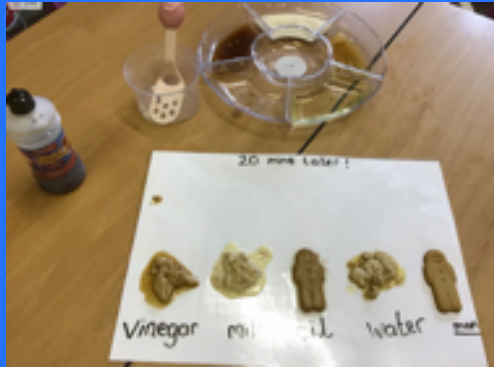
Green  
type-Staff  
comments

Purple type-  
School  
documents

# Cambo Principles of Good Teaching and Learning in Science

Children make links across the curriculum

Rec/Y1 read The Gingerbread Man in **Literacy** and asked the question "Would the Gingerbread Man have made it across the river without the fox's help?"



Children are enthused and challenged by their learning



Identifying and Classifying Things

Yad could investigate the metals systematically.  
Do the metals all share the same properties?  
most metals are smooth and shiny but some are magnetic and some are not like aluminium.



Children are **challenged and extended** in their learning with concept cartoons from The Royal Society of Chemistry. Y3 and Y4

Children ask scientific questions

How does sound travel?  
How does the vibration change?  
Does sound float?  
Can sound go round corners?



Y3 and Y4 **asking questions** about sound and, using materials provided, to **design experiments** and **draw their own conclusions**.

"Which is the best material to soundproof the pre-school conservatory. The children then wrote to the pre-school leader to explain their findings.

Children are challenged to **extend their learning** through marking. Y2. Do all metals have the same properties?

The impact of the principles is clear in the children's reflections on their learning. They are **using and quoting the principles independently** in their self reflections.

I can Set up Practical enquiries  
I can ask Scientific questions  
my favourite topic is Light

scientific answers. He nee this - 10.1.20. Good explanation  
I can ask scientific questions  
I can make careful observations  
my favourite thing to do in science  
forces and magnets

# Cambo Principles of Good Teaching and Learning in Science

Children explore and design their own investigations

Year 4 investigating soundproofing using a data logger  
**designing the whole context and experiment**

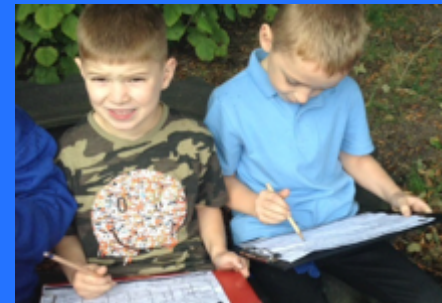
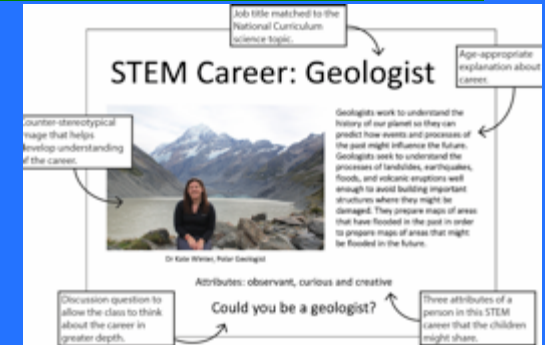


Rec and Year 1 **leading their own investigation** into habitats for mini beasts; exploring what they eat, where they live and how they move

Children develop real life learning experiences



Lessons are started with a **link to a specific career** using NUSTEM so Y3 and Y4 learned about being a geologist before starting a Rocks unit and investigating the uses of different rocks around school



Children use a variety of environments



Rec and Y1 exploring seasonal habitats around **school and Wallington grounds** using their forest school skills



Y3/ Y4 working in a **science lab**



Year 2 exploring **local woodland**. Living Things and Their Habitats



Rec carrying out a science investigation in the **classroom**



## SL1: There is a clear vision for the teaching and learning of science

### Broad Success Criteria:

Children will use a range of enquiry types to answer scientific questions about the world around them.

Children will work independently to ask scientific questions; plan how to investigate them; carry out and evaluate investigations

Staff will have a shared understanding re the purposes of assessment in science and use current best practice to improve science teaching, learning and assessment.

There will be a school wide commitment to Science Improvement

The school community will feel empowered and confident in supporting and promoting their child and will take part in initiatives that encourage all children to think that science is relevant and important to their everyday lives and their future.

Staff will engage positively in a sustained programme of CPD to develop their knowledge, understanding, skills and assessment

The subject leader will provide regular, sustained support for colleagues in response to development needs.

The subject leader will be an excellent role model developing/introducing new ideas/strategies

Teachers will use and evaluate a range of evidenced based strategies for teaching science, which challenge and support learning needs of all children.

Resources will be centrally organised within classrooms and staff/children will be able to access them independently and safely Excerpts from SDP



Steps have always been in place to review science teaching and learning in school but PSQM has made it a **central focus of the SDP** with positive steps to support children, teachers and the wider school community

Impact: The children feel empowered by the principles as they have been part of the process of developing them. (Pupil questionnaire) This gives them ownership of science and the children are engaging actively in their own learning. The children interact with the principles daily. They are identifying in lessons. The children have commented they feel they have knowledge to give their parents about science and can explain to them how science is important and relevant. The principles raise the profile of science in the community through regular assemblies to share science.



Science principles are displayed in the hall for all children, staff, governors and community groups. Examples of **how these principles are realised** are also displayed. A set of principles are also displayed in each classroom. Children are encouraged to **identify principles** being used in lessons. The principles are displayed on our new school science page with photos of science activities the children are engaging in. Currently the home learning tasks are shared through Tapestry and Learning Logs but this aspect will be developed on the website.



## SL2: There is a shared understanding of the importance and value of science

Community assembly to share science principles Jan 2020



Interactive classroom displays which children share with parents when coming into school or using after school facilities encouraging the sharing of science around school. Parents comment on their science learning at home through Learning Logs.



Impact: "AT KS1 attainment remains highest in science. " SDP

The whole school community understand the importance of science at Cambo and contribute to its implementation. Girls and boys achieve equally in science at Cambo school. 60% of children stated "We are scientists (unprompted when asked what a scientist is on a questionnaire). Parents are extremely enthusiastic in being involved in science at home and this is evidenced in our online journal, Tapestry. This is evidenced in detail later in this portfolio .The combination of science linked assemblies, our online journal, Learning Logs and now our website has linked the whole community together in a joy of science. Teachers are asked weekly by parents "Can I come in to talk about...?" The enthusiasm is clear in the 100% participation.

Parents, governors, teachers and outside agencies currently involved in Lego, Raspberry Pi and STEM groups



Parent comment about my homework

Poppy enjoyed looking for the different seeds and learning about the different trees and plants and where the seeds come from and that different seed pods have different amounts of seeds in them

Science students in the local community are encouraged to share their expertise.



## SL3: There are appropriate and active goals for developing science

Science is being developed through **children's voice, staff meetings (reviewing planning and assessment), Partnership meetings, hub meetings**. The science leader and other staff took part in the Three Rivers Federation meetings to establish what a **Partnership scientist** would look like and from this established what a Cambo scientist looked like. The science leader was instrumental in creating a hub to **continue to evaluate** these statements.

**Impact:** Science has a strong presence in the SDP and performance management. Our approach to teaching science, developed further through the PSQM process, has been used to reflect all learning in the Cambo Curriculum statement. This has created a connected vision of teaching and learning.

The curriculum in our school is planned via teachers and children. It is sequenced using a creative 'skills based' approach. Where possible a variable mixture of whole school topics, mini projects and themed days are developed, motivating and capturing the interest of our children. Rigorous teaching of discreet subject specific skills and knowledge is delivered alongside opportunities to apply those skills in a cross curricular context. We feel that this helps our children to make links in their learning. We aim for our children to have: ownership of the curriculum; to be inspired by their learning, to develop enquiring minds, a sense of their own identity and respect for other cultures.

Cambo curriculum statement reflects and reinforces science principles

What will a Morpeth Partnership Scientist look like?

|                          | At the end of EYFS they will have the following skills:  | At the end of Year 2 they will have the following skills:   | At the end of Year 4 they will have the following skills:   |
|--------------------------|--|---|---|
| <b>Being a Scientist</b> | <p>The principal focus of science teaching in Early Years is to enable pupils to develop emerging science skills required as precursors to the statutory requirements of Working Scientifically in Science for Key Stage One.</p> <p>Children should:</p> <ul style="list-style-type: none"> <li>be encouraged to show curiosity about objects and people.</li> <li>know how to take risks, engage in new experiences and learn by trial and error.</li> <li>find ways to solve problems, find new ways to do things and test their ideas.</li> <li>develop ideas of grouping, sequences, cause and effect</li> <li>know about similarities and differences in relation to objects, materials and living things</li> <li>comment and ask questions about aspects of the natural world</li> </ul> | <p>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as</p> | <p>The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</p> |

Teachers constantly seek out innovative and creative ways to teach the inspiring curriculum. They understand all subjects very well across all areas of the curriculum. Teachers use this knowledge to plan high-quality lessons, which contribute to pupils' outstanding progress. Local Authority annual review Autumn 2019 carried out by SP

Knowledge organisers for each unit of work in science have been developed for the whole Three Rivers Federation by the SL.

| Important Questions  | Key Knowledge  | Vocabulary  |
|--|--|---|
| 1. What are the different parts of a flowering plant?                  | 1. To identify the different parts of flowering plants   | 1. Flowers The part of a plant to attract insects and where the seeds are formed.                   |
| 2. What are the functions of the different parts of a flowering plant? | 2. To be able to describe the functions of different parts of flowering plants                     | 2. Formation How something is created   |
| 3. What do plants need to grow?  | 3. To explore the requirements of plants for life and growth and how they vary from plant to plant | 3. Leaves The part of the plant where food is produced  |
| 4. How is water transported in plants?                                 | 4. To understand the way in which water is transported in plants                                   | 4. Nutrients These are necessary for the plant to make energy, grow, develop and reproduce          |
| 5. What is pollination?  | 5. To understand the process of pollination and the importance of bees in this role                | 5. Photosynthesis The process by which the leaves turn sunlight into food                           |
| 6. How are seeds formed?   | 6. To explain how seeds are formed   | 6. Pollination The process by which the pollen is transferred from one flower to another to another |
| 7. How are seeds dispersed?  | 7. To discuss the different ways that seeds can be dispersed                                       | 7. Roots The part of the plant that secures it in the ground and takes in water from the earth.     |
|  | <b>Key Skills</b>  | 8. Seed dispersal How seeds are transferred from the plant to reproduce                             |
|  | 1. Ask relevant questions about the effect of different factors on plant growth                    | 9. Stem/Trunk The part of the plant that transports water and holds the plant upright               |
|  | 2. Make use of careful observations to discover what plants need to grow                           | 10. Transport How something travels from one place to another                                       |
|  | 3. Use oral and written explanations to report on findings e.g. water transportation               |   |
|  | 4. Set up a practical experiment to discover the effect different factors have on plant growth     |   |
|  | 5. Make use of drawings, labelled diagrams, bar charts and tables                                  |   |



## SL4: There is a commitment to the professional development of subject leadership in science

Impact: the development of subject leadership in science has led to increased CPD, a continuous reflection and review of science teaching and learning, improved resources and use of resources, outstanding home/ school links in science and extended links with other schools . The subject leader has been instrumental in starting a science hub for first schools locally.

Previously there was no hub. We have met twice now to carry out moderation, share ideas on how to ensure all enquiry types are being carried out, look at ways to use knowledge organisers and consider different ways to assess.

The subject leader, **through leading CPD** has encouraged staff to use a range of different resources from The Royal Society of Chemistry, ASE resources and exemplars of work, Explorify in classrooms daily, concept cartoons and Marvin and Milo.

The subject leader has led the **inclusion of science in the School Development Plan** as part of GILT award and carried out the implementation of action plans.

**Subject leader worked with staff in other schools** in the Partnership (First, Middle and High) to develop a vision of science and devised knowledge organisers for each science unit. The science leader was responsible for knowledge organisers across the Federation for Year 2, 3 and 4.

Teachers constantly seek out innovative and creative ways to teach the inspiring curriculum. They understand all subjects very well across all areas of the curriculum. Teachers use this knowledge to plan high-quality lessons, which contribute to pupils' outstanding progress. Local Authority annual review Autumn 2019 carried out by SIP

The subject leader regularly attends STEM CPD and reviews need in school for staff and sources relevant courses.

### Objective 1 – Professional development

To further develop Science across the school and gain The Primary Science Quality Mark at Gilt level

#### Objectives

- To take a leading Science role in the shared Coordination Process
- To audit Science Provision across the school and use these 13 action plans to develop provision and excellence in science.
- To audit science resources and ensure that children have access to high quality resources which are used safely- including the outdoors.
- To ensure that all resources are well organised, accessible and are freely available for children's use across the school
- To continue to use the audit to improve teaching and learning in Science via Science Quality Mark [PSQM-Gilt]
- To develop a shared understanding of the purpose and process of science enquiry with staff and children across the school
- To develop home school links with the child as an EXPERT in Science
- To develop a whole school/shared understanding re the purposes of science assessment and current best practice
- To ensure that there is a whole school commitment to develop every child's Science Capital
- To audit skills/knowledge and understanding in Science and develop a Science CPD timetable for individual staff
- To make use of STEM funding and prioritised funding for Science re CPD across the school
- To engage in high quality CPD and embed these principles into high quality teaching, learning and assessment across the school e.g. TAPS / AFL

#### Success Criteria

- I will have taken a leading role in reviewing the science policy, curriculum across the partnership and school with colleagues ensuring it establishes a clear vision and progression for science across the age ranges
- I will continue to develop pupil voice within Science
- I will continue to attend training linked to achieving PQSM

Science has an **ongoing strong emphasis** on the subject leader's performance management.

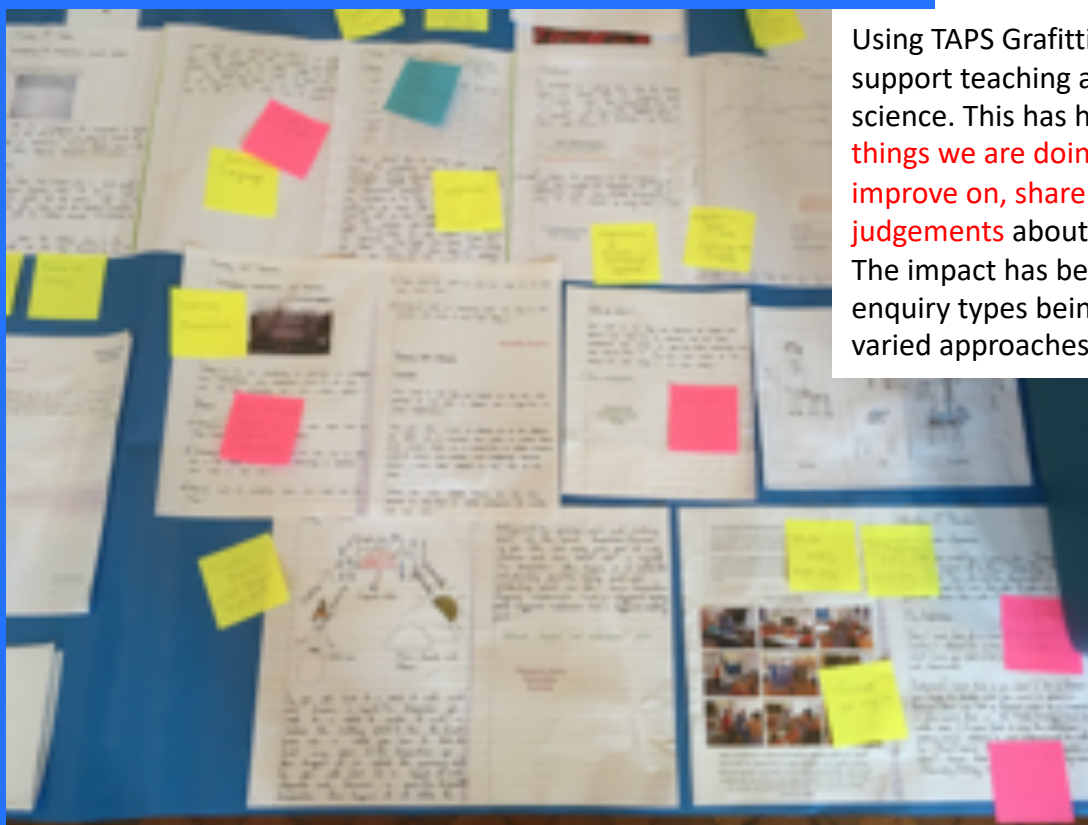
## SL5: There are monitoring processes to inform the development of science teaching and learning

| Mandatory assessment | Cambo Data |      |      | LA Data |     |      | National Data |     |      |
|----------------------|------------|------|------|---------|-----|------|---------------|-----|------|
|                      | EM/T       | Exp  | Dpth | EM      | Exp | Dpth | EM            | Exp | Dpth |
| EYFS GLD             | 0%         | 100% | N/A  | 25%     | 75% | N/A  | 28%           | 72% | N/A  |
| Phonics Y1           | 18%        | 82%  | N/A  | 16%     | 84% | N/A  | 18%           | 82% | N/A  |
| Phonics Y2           | 0%         | 100% | N/A  |         |     | N/A  | 9%            | 91% | N/A  |
| SATs Y2 Read         | 10%        | 90%  | 30%  | 22%     | 78% | 29%  | 25%           | 75% | 25%  |
| SATs Y2 Write        | 10%        | 90%  | 10%  | 27%     | 73% | 19%  | 31%           | 69% | 15%  |
| SATs Y2 Math         | 0%         | 100% | 30%  | 21%     | 79% | 24%  | 24%           | 76% | 22%  |
| SATs Y2 Science      | 0%         | 100% | N/A  | 15%     | 85% | N/A  | 18%           | 82% | N/A  |

Data is monitored using Sims. (this data July 2019) Science is 15% higher than the LA and 18% higher than the national data. Maths data has improved by 11% on last year in part due to improved skills in science in areas of data handling, division (from calculating density) and problem solving.

Assessment in books has been developed using PLAN ASE documents and exemplars. Marking is used more to **extend and reinforce** learning (feed forward) rather than simply comment on how objective has been met.

Mrs. Robson curriculum governor and vet came into school to review teaching and learning including monitoring and assessment. Her report commented that she was “so impressed with how the children could talk about their science learning with such knowledge and enthusiasm.” Science is an **annual focus** of governors’ visits and linked to the SDP. Autumn 2019



Using TAPS Grafitti Wall activities to support teaching and learning in science. This has helped us to **identify things we are doing well, areas we could improve on, share ideas and agree judgements** about the children’s work. The impact has been a wider variety of enquiry types being used regularly, varied approaches to assessment

This is a school where monitoring and evaluation of attainment and progress occurs naturally as part of close team working. All staff know the children well, both socially and academically and frequently discuss pupil progress...formative assessment is continuous and effective. Local Authority Annual Review Autumn 2019



# T1: There is engagement with professional development to improve science teaching and learning

pupils' When, - their understanding regularly checked - clear - timely support. Good feedback from TA - left after 10 minutes with task well underway and all pupils consolidating knowledge/ learning with explanations. This observed - inspirational experiment (see over). After a T demonstration the pupils undertook the practical. As in class 1 observation, scientific language & explanations of processes was excellent, as was T questioning, checking of pupil understanding, and clear and timely support for all pupils. Through a task which was both "tricky and possibly "embarrassing" T was sensitive on v. calm - positive - as a result, pupils learnt extremely well. Judgements - children highly motivated, curious, expanding on previous knowledge. Excellent co-operation between of respect T/P and P to Pupil. Excellent co-operation between. Excellent vocabulary development. The learning across the ability groups was outstanding. Resources were excellent. Support staff v. well - the latter were also used. AFI - nothing of significance!

Impact: Increased and focused CPD has led to improved teaching and learning in Science. Described as outstanding and inspirational when observed by School Improvement Partner. (Local Authority observation Jan 2020.) The staff questionnaire helped to focus CPD needs – essential for a two teacher school-and ReachOut CPD provides regular training for each topic taught.

I feel I have identified my CPD needs more carefully and matched courses more specifically to what I needed.

Subject leader CPD alongside regular hub meetings with other science leaders has enabled the development of teaching and learning

STEM training has been most effective as subject leader in terms of curriculum planning and Ofsted preparation but the Reach Out CPD is having a great impact on seeing new ideas in the classroom

I love ReachOut CPD. It refreshes my knowledge and inspires new ideas for teaching. It doesn't take long but has a big impact.

The science leader conducted a detailed staff questionnaire about all aspects of science teaching including identifying CPD needs. This was then matched to specific courses . Oct 2019.

|  |   |  |
|--|---|--|
| Exploring and observing skills               |   |  |
| Grouping and classifying skills              |   |  |
| Questioning skills                           |   |  |
| Research skills                              |   |  |
| Modelling skills                             | ✓ |  |
| Collaborating skills                         | ✓ |  |
| Planning and testing skills                  | ✓ |  |
| Using equipment and measures                 | ✓ |  |
| Communicating skills                         | ✓ |  |
| Describing results                           | ✓ |  |
| Explaining results                           | ✓ |  |
| Year group appropriate scientific vocabulary | ✓ |  |

## T2: There is a range of effective strategies for teaching and learning science which challenge and support the learning needs of all children

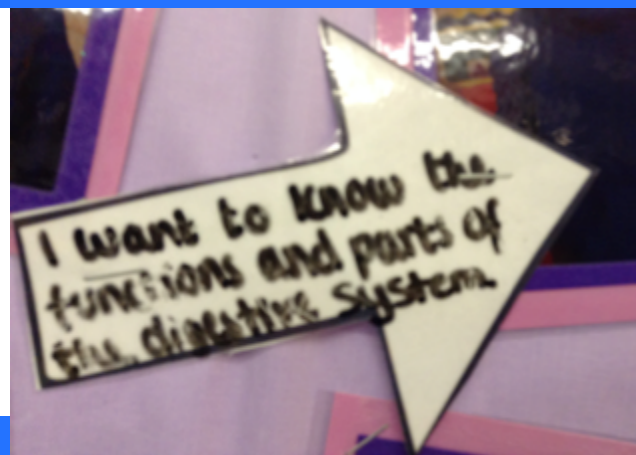
### Key Learning (continued)

#### LKS2: Year 3 – Plants

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- Investigate the way in which water is transported within plants.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
- Roots grow downwards and anchor the plant.
- Water, taken in by the roots, goes up the stem to the leaves, flowers and fruit.
- Nutrients (not food) are taken in through the roots.
- Stems provide support and enable the plant to grow towards the light.
- Plants make their own food in the leaves using energy from the sun.
- Flowers attract insects to aid pollination.
- Pollination is when pollen is transferred between plants by insects, birds, other animals and the wind.

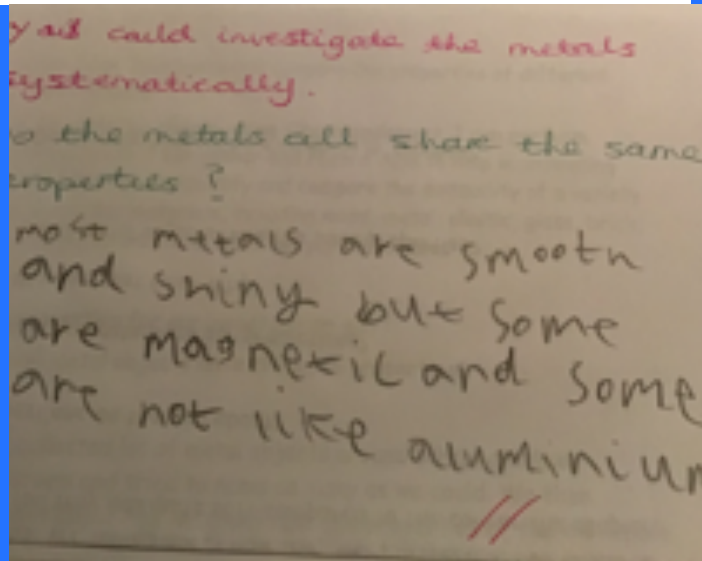
Key learning is established for each unit of work in science (using Lancashire Inspiring Science) and acts as a draft plan but this is adaptable to take into account children's own interests and the needs of individual children. In this way, planning and teaching strategies can ensure that pupils can work on **their own individual objectives** within this framework. This was suggested in our last Ofsted, which rated Cambo as outstanding, but suggested personalised learning could be further implemented in such a small school. The objective for one pupil might be to name parts of plants while another may to describe its function.

Children are encouraged to **set their own learning goals** for science. This is recorded on a target board in the classroom linked to Cambo marking policy.



**Feed forward marking** is being developed to support and extend pupils on an individual basis. Year 2 book. After testing the properties of different metal objects, the teacher asks "Do all metals share the same properties?" Children are encouraged to develop their responses. This child gives a range of examples.

As at KS1, the progress made by groups of pupils is **consistently strong**. Those who are disadvantaged or have special educational needs and/or disabilities continue to make outstanding progress. Local Authority Autumn 2019 review





### T3: There is range of up-to-date, quality resources for teaching and learning science which are used regularly and safely



Impact: Science was already a well resourced subject but some resources did need updating . Investment in new data loggers have meant they have been used more frequently as they are more suitable to a wider range of primary investigations. Reading the data has improved data handling in maths with children making the links between the lessons. Some of the best resources have been low cost .A greater range of new science books have seen children selecting these to read independently and subscriptions to This Week and National Geographic Kids has led to self initiated experiments and scientific reasoning at home and school.



Children as young as reception are encouraged to use resources safely.

Children are being “trained” on a rota to work as technicians to encourage **respect and responsibility** for resources alongside safe use. CLEAPPs videos are used to support safe use of equipment.



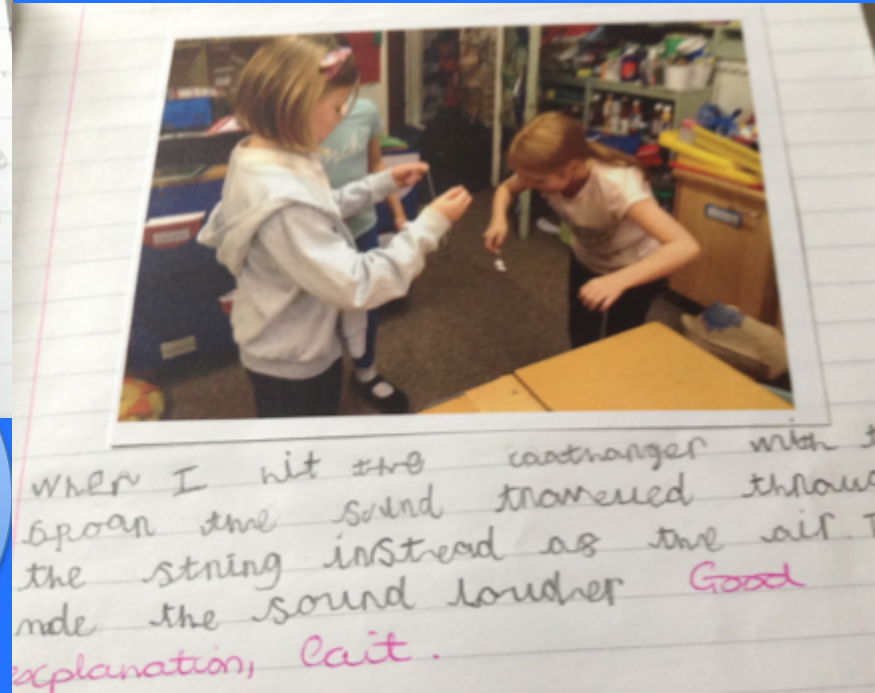
The data loggers are so cool. I love using graphs  
James

New up to date and primary specific data loggers have been purchased and have been used to measure light sources and sound proofing to date.

Each topic is being audited for resources as part of initial planning to develop quality resources. This is being recorded on a spreadsheet. A topic by topic approach is ensuring essential but creative resources are bought that are easily stored and accessed by staff and pupils.

# L1: There is a shared understanding of the purpose and process of science enquiry

Y3 and Y4 asking **questions** about sound. The entire topic is then approached by providing resources and the children used these to **find the answers to their** initial questions. They recorded their understanding. (From a PSTT Explore Engage Extend activity)



Dear Isahane  
I have tested five different materials and my results show that the best material to soundproof your pre-school conservatory is sugar paper. It is the best material because it absorbed the most sound vibrations from the CD player. After the sound had travelled through air and in to the solid. Everyone did not get the same results which might be because we lined the box differently or because of noise from Isahane in the kitchen.

Letters to the pre school leader after planning and investigating which material would be best to soundproof the pre school room. Letters show **children's evaluation** of an experiment and factors that may have affected it.

We can't do it like that. It wouldn't be fair! We'd have two variables.  
Archie

If we are observing how our rubbish decomposes, we are doing observations over time but is it not also a comparative test? Tommy

Let's make a list of equipment we are going to need.  
Thomas

Recordings of children planning investigations in science week March 2020

"Given a range of resources, the children decide for themselves how to gather evidence to answer the question. "Plan ASE progression document.

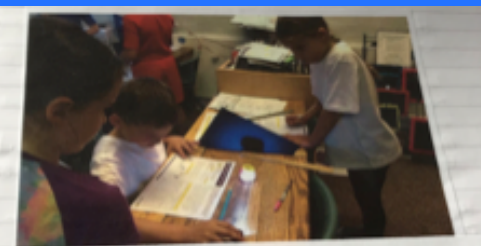
The subject leader used the document in CPD sessions to encourage teachers to develop their **purpose and process of science enquiry**.



# L1 There is a shared understanding of the purpose and process of scientific enquiry



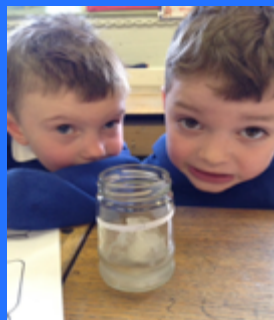
Rec and Y1 finding out about good and bad bacteria and growing germs!  
**Identifying and classifying**



18/9/19

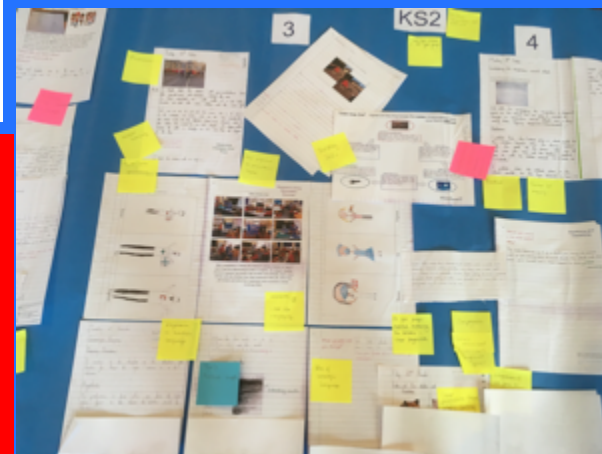
L.O. 1 recognise that shadows are formed when a solid object blocks the light from a light source.  
I can find patterns in the way that the sizes of shadows change.

Y3 and Y4 looking for naturally occurring **patterns** and relationships. Investigating changing shadows



Whole school investigation How much water is there in snow?  
**Child led investigation**  
**Observing Changes over Time**

Classroom displays reinforce understanding of different enquiry types.

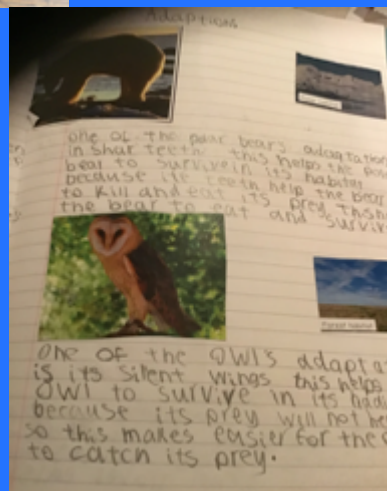


Impact: All enquiry types are used evenly. Children are able to articulate enquiry types and to suggest the most appropriate for carrying out a specific investigation. Children can ask questions, plan, carry out and evaluate an investigation. They can suggest if another enquiry type might have been more suitable.

Book scrutiny analysing teaching and learning including **identifying the use of different enquiry** types across the year groups. The impact has been seen in greater balanced coverage of all enquiry types. There will be ongoing audits to maintain this.



Year 3 and 4 collecting different items in science week to compare decomposition rates. **Comparative and fair tests and observation over time.**

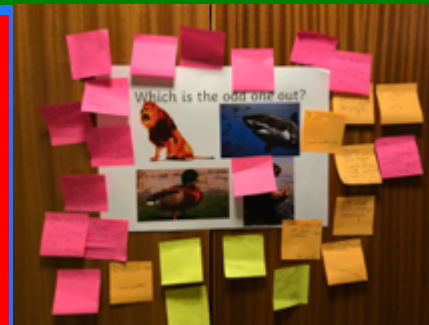


Y2 researching using **secondary sources** to explore animal adaptations

## L2: There is a shared understanding of the purposes of science assessment and current best practice



Impact: Before and after TAPS . Using TAPS and ASE exemplars the subject leader carried out CPD to develop methods to assess science. There is now greater use of peer assessment, self assessment, feed forward marking and a Cambo booklet to give examples of secure expected levels. This has also been used with older children to peer and self assess; comparing their work to that in the book and setting their own next steps.



Assessing learning in Rec/Y1 Animals including Humans. Odd one out activity. Checking vocabulary and understanding of word meanings. Inspiring **critical and lateral thinking** skills. Observation and discussion skills.



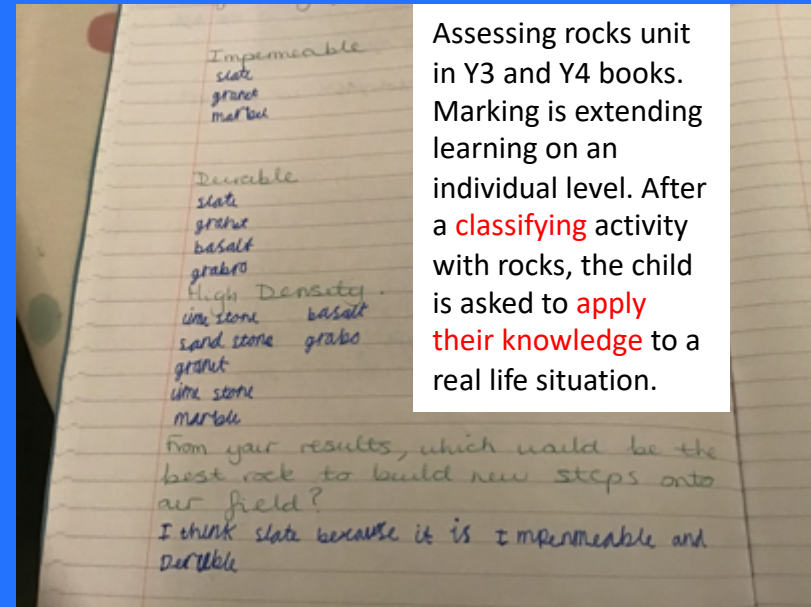
An example of the use of Plan ASE exemplars to assess understanding in Rocks following CPD by subject leader Y3 Y4 Child chose durable as criteria to sort.



Impact: As a result of an ongoing process of observations, book scrutiny, moderation and staff meetings, it was decided not to carry out "tests" such as the previously used RisingStars. It was felt that such tests were not telling us anything significant. Books and practical activities are now used to assess, extend and reinforce learning.



Y1 testing materials to safely catch Humpty Dumpty when he fell. Children were given materials and asked to **design an investigation**. Assessing knowledge of materials at end of unit



Assessing rocks unit in Y3 and Y4 books. Marking is extending learning on an individual level. After a **classifying** activity with rocks, the child is asked to **apply their knowledge** to a real life situation.



# L3: There is a commitment to developing all children's science capital

Week commencing 2nd March 2020

Science is all around you every single day, inside, outside, everywhere. Watching things change from liquid to solids, watching ice melt and water freeze, cooking – that's all science. Science is about observation. You can take a magnifying glass in the yard and look at trees and bugs. What are you noticing, any signs of spring? Changing bread into toast is science; it's an irreversible change. What else do you change that can't be changed back again? Animals all around you, the food they and you eat, the weather... it is all science.

As we run up to Science week, we are asking you to think of the science you have all round you at home.

## Take a science look around the house (suggestions)

- Take a look through your storybooks, are there any linked to science? Hungry Caterpillar, Funny Bones, Oliver's milkshake or vegetables stories about animals, Owl who was afraid of the dark, Mob on the moon, Aliens' love underpants!
- Do you have any non fiction books that are linked to science
- Do you have any science kits that you have used at home –Horrible science
- Have you built a wormy, been on a bug hunt or looked at a butterfly
- Watched birds feeding on a bird feeder and compared different types of bird, noticing differences and similarities

## What can I do?

- Take photographs to record the science you spot at home
- Bring into school the storybook you find containing science – maybe you could record what science you spotted in the book
- IF you have any kits, maybe you could bring them in to share with your friends
- Put on you 'science goggles' and take a science walk and look for signs of spring, animal tracks or evidence of food eaten by herbivores, carnivores or omnivores
- Bake or cook and take photographs of the changes.

Parent comment about my homework

Peer comment (completed back at school)

My comment about my work

Teachers comment



Impact: Using Explorify daily, taking part in more competitions, specific learning log homework, encouraging children to share their science at home and school has led to an enthusiasm and “buzz” around science. The excitement is shared on Tapestry with the whole community taking part. “We are all scientists” said 60% of children on a recent questionnaire. EVERY child in school has contributed. Many children took part previously but the PSQM focus has raised participation to 100%



Children access local museums such as Centre for Life and Discovery Museum. On our bi-annual London trip we visit the Science museum. All children will visit before leaving Cambo.

Bridge building as part of Crest Award



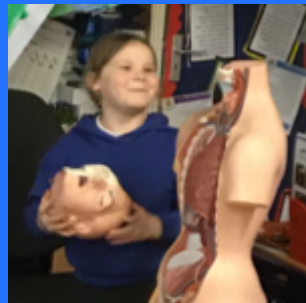
Whole School took part in a national challenge to invent a way to reduce the use of single use plastic



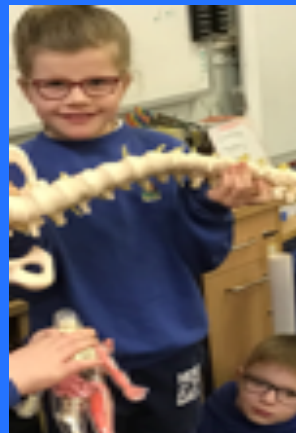
Learning Log homework across the school to encourage children to explore science at home and bring in any science resources they wished to share.

Sharing a homemade volcano eruption

Sharing mum's first aid models



Sharing dad's knowledge and enthusiasm for bones!



We have applied for a STEM ambassador in school but while waiting have involved science students in our local community to support. Working with Maddey a final year student at Manchester Metropolitan University BSC Nutritional Science supporting Animals Including Humans unit in Year 1 and 3



# WO1 There are appropriate links between science and other learning

Science is everywhere!  
Rebecca

Emma says science is important for any job because you need it in all subjects.

I like that we do science in other subjects  
Anna



Rec and Y1 making careful observations of seasonal changes to sketch snowdrops.  
**Art and science**

Making a sandwich is science! Wow I didn't know that!  
Cait

DT designing and making earthquake proof buildings linking **science, geography and DT** Years 2, 3 and 4



Linking **science and geography** with a geologist visit across the school enhancing learning about different rock types and volcanoes; how they form, where in the world we find them and why.

Science book of the week (all ages) celebrating **Literacy and Science**. Also through science newsletter and writing science news stories for learning Log homework



|  |  |  |
|--|--|--|
| <b>Literacy/ Spelling/ Phonics</b><br>Pearson Wordsearch Planning<br><b>Non-Fiction</b> - The Most Incredible Sport: Distinguishing between fact and opinion. Writing a newspaper report. Using skills in how to write a newspaper report to write a science newsletter. Choose editor.<br><b>Fiction</b> - The Iron Man. Focus on simile, noun phrases and powerful verbs.<br>Poetry-Exploring poetic form including kenning and raga.<br>Spelling: Oxford Owl programme.<br>Letters to Gambian children. | <b>Mathematics</b> Abacus Spring planning<br>Place value 3 digit numbers<br>Fractions-equivalence and adding to a whole.<br>Geometry-perimeter, angles<br>Telling the time to nearest minute and calculating time intervals.<br>Column addition and mental subtraction (number line)<br>Grid method of multiplication.<br>Capacity-Calculating density based on "Ancient Greek Science." | <b>Science</b><br>Rocks/ Animals including Humans. Backs link to Geography and geologist visit<br><b>Visitors</b><br>Dr. Mike Sarsett/21g consolidate animals including human.<br>Y3 Food and Nutrition Webquest visit Nutrition-how to plan a healthy sandwich.<br><b>Science week</b> - Our Diverse Planet-visit from <b>Calid</b><br>Rocks to carry our Geology workshops. Focus on volcanoes.<br>Great world activities.<br>Link to Gambia/discussion of plastic use |
| <b>Geography</b><br>Place knowledge<br>Compare UK/Gambia to Africa/Gambia and Madagascar.<br>America<br>Human and Physical Geography Extremes Earth-volcanoes, earthquakes, tsunamis, tornadoes. Link to America, Mount St Helens <b>study</b> Link to Rocks help Geologist visit. <b>Calid</b> Rocks.<br>Parent visit: Mrs Abercrombie. The science of winds and clouds when flying a helicopter.<br>Geographical skills and Feedback 5 and 4 figure grid references                                      | <b>Eco Kids</b><br>Y3  | <b>Expressive Art</b><br>ART - Watercolours- visit to Using art gallery to start the topic. Artist-Turner<br>Use sketch books to record ideas<br>Make - Mrs Hedley Music and violin<br>Mrs Anderson Friday 2D arts outreach/ tuned instrument and singing/duke group<br>Peripatetic lessons on guitar, keyboard<br>Wellington art installation project   |
| <b>PE/E/ RE</b><br>Easter Story with <b>Whitby</b> Church Journey Science and religion<br>Internet safety week-identity<br>Stanswell LGBT / Jigsaw planning<br>Operation Endeavour/Encamp work with Sarah  | <b>PE</b><br>Dance Michele Hankinson<br>Gymnastics- Sam Dransfield<br>Swimming- Ponteland Instructors<br>Dorey Hooper outdoor PE   | <b>Design Technology</b><br>Designing and making an earthquake proof building  |

**Cross curricular planning** is used to link science to other subjects. This has always been done but we are building in more parent/ community visits as a matter of course and analysing that science has been linked to all subjects across a year.

Linking **science and maths** with work on density following a trip to The Centre of Life exploring Ancient Greek Science! Year 3 and 4



Rec and Y1 **science and maths**- measuring work during an experiment



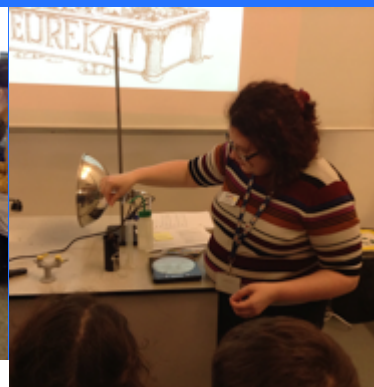
## WO2 There are appropriate links with families, other schools, communities and outside organisations to enrich science learning



**CeledRocks** working with the whole school on science and geography. Exploring different types of rock and volcanoes



Dr. Mike ( a **parent, local doctor and governor**) talking to Rec and Y1 about good and bad germs



Attending workshops at the **Centre for Life** enriching learning in Science and history. We also saw how science was relevant to lives in the past and how we have developed this science today.



**Warburtons** holding a workshop on nutrition

We have always had visitors in school to support science teaching and other subjects but we have been able to develop the links to include different groups in the community and discovered that our school community have a lot more to offer!



Working with **local churches together, WI and local volunteers** to celebrate Easter comparing science and RE thinking

**Zoolab** visits with a focus on Rainforest habitats



# Children across the whole school taking part in science

We went litter picking and nature spotting today at home. We saw lots of birds and were getting our eye in to identifying them before we take part in the big bird watch. Highlight was seeing a lesser spotted woodpecker! (posted to Tapestry) Rec and Y2



Y1 following up their friendly germs work at home making sourdough bread

Y1 planting seeds at home

Impact: This is the first of two remaining slides illustrating the fantastic impact of our PSQM GILT process. It needs an extra slide to convey the enormous amount of science being carried out at home by the parents of Cambo children and shared through Learning Logs and Tapestry (online journal). What greater impact than the enthusiasm and enjoyment of science across our small school (Rec to Y4) and both classes with 100% contribution.

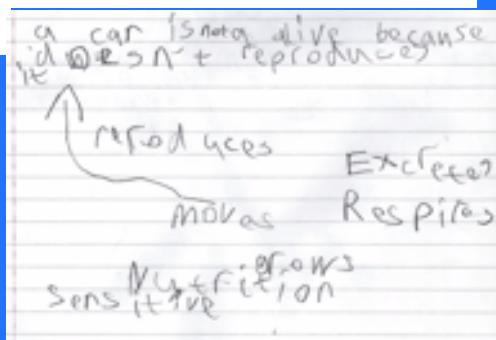
All Rowan wants to do at home is science! Y4 mum



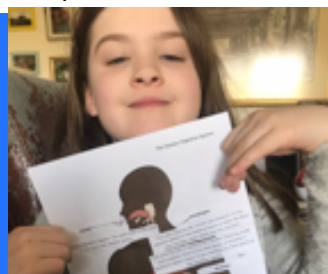
Year 3 and 4 moving a paperclip with sound vibrations. (Pyjama experiment!)



Can light be poured? Marvin and Milo. Year 3 and 4 home challenge. Parents posted videos of experiment to Tapestry.



Home jottings about alive/never alive and life processes Y2



Y4 researching the digestive system at home



Y3 exploring surface tension at home



Exploring sound with mum's best glasses! Year 3

James took a trip with daddy to the field to look at soil science (farming science at its best) They captured a photo of the grass, worms and also manure spread on the land to help regenerate the soil. Daddy has explained to James how worms and the manure benefit our soil.



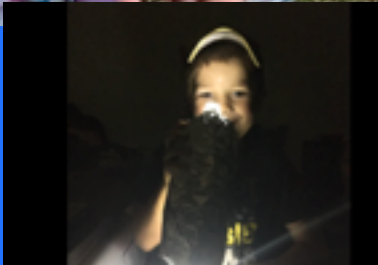
Y3 having fun with a range of science kits at home!



Whilst playing in the garden, I set the children a task of looking for signs of spring. We discussed seasons and both children agreed it was now spring. They enjoyed this task and identified plants starting to grow such as: small sycamore trees starting to shoot, daffodils, daisies, hellebore's, crocuses, tulips, primroses and new buds to the trees. All signs of growth and 'spring'. We found a lady bird crawling, obviously out of hibernation in this fair weather. Other things we considered were the loud bird song in the trees and the birth of new life, the lambs! Which are born every spring time. See photos. Mum of pre school and Y2 child



Archie and I found this very interesting. You really don't realise what is in your food. We went through all the nutrients and what they all mean and looked at some different foods. Spaghetti hoops are quite healthy! Mum of Y3 child



Y3 exploring light at home using torches and mirrors



Seed growing at home Y3 and Y1



Exploring nutrition and flavours. Y3



Y4 Making instruments exploring sound



Reception-carrying out a colour chromatography experiment at home!



Using a science kit at home listening carefully to the effect of combining vinegar and bicarbonate of soda. Y2

So this morning James and I decided to see what items around the house are waterproof and what is not waterproof. James put them into 2 piles and we tested them. James was surprised that the bit of wood seemed waterproof, but as we discussed maybe not forever 😊 and we are waterproof Dad of Y1 child

### Summary of impact on children

On a school questionnaire March 2020 ALL 48 children in school (100%) stated they **loved** science.

On the same questionnaire 80% of children thought science was taught most days and the remaining 20% thought science was taught at least three times a week.

There is always an investigation on the go! At school or at home. Children are always asking “What can we investigate next?” Currently in school ALL children are at an **expected** level for science.

In answer to the question “what is a scientist?” Children stated “I am a scientist, the study of everything, a person who studies the World.”

Comments were equally positive for boys and girls. 100% of girls thought they could be a scientist (and boys!) Children are being specific.

E.g. “I want to be a marine biologist, geologist, chemist...”

No child could think of anything they did not like about science and could think of nothing to improve (except to do even more science). The children’s comments and their science involvement at home support our aim of there being a “buzz’ about science.

### Summary of impact on staff

Staff at Cambo have always enjoyed teaching science and children have enjoyed learning. The process of the PSQM award has ensured that best practice is highly consistent across school and regularly evaluated and improved via science focused staff meetings , science hub and moderation meetings with partnership schools. A more regular evaluation of how science is developed is now in place.

As a staff, the focus on science through this award has meant staff have felt more “confident and empowered” to teach science. (100% of staff)

New ways to build science capital and science into everyday (Explorify, PSTT, concept cartoons) have been introduced. New planning has helped to make lessons accessible to all children and ensured that 100% of children are achieving well in science. Ideas for assessment (such as ASE exemplars of evidence) have ensured staff feel more confident about their judgements.

The creation of a science hub by the science leader has ensured further moderation across schools and that a development cycle of evaluation is firmly established within and beyond Cambo school.

### Summary of impact on wider community

45% of school parents have commented on how they are enjoying doing science at home. They are requesting more as it is “fun” homework.

Footfall in school during science week increased (3/4 of families) with parents attending to share activities and their experiences of science. Especially on Friday of science week when EVERY child in school had a parent/guardian attending a special assembly to celebrate our science work.

Two parents have come into school asking for advice on how to get into teaching as they have been inspired by science work in school.

One parent said “I had forgotten how much I love learning and love science and seeing children so inspired!”

The online learning journal has been flooded across the year with photos of science at home activities; some encouraged by school but some completely independently and following the child and parent interests. 100% of families have contributed to this.