

Learning and Growing Together

Who You Are Makes a Difference

Our Golden Aims

Successful Learners

Confident Individuals

Responsible Citizens



Our Golden Principles

I am responsible

I am resilient

I show respect

I learn well



BRADSHAW HALL
PRIMARY SCHOOL

Our vision for Science

- Through rich experiences, children will learn about the knowledge, processes and uses of science in the modern world. Children will develop a conceptual scientific knowledge through active, rich and challenging learning experiences. They will be encouraged to see how science can be used to explain events, predict how things behave and analyse causes. The school also encourages a sense of excitement, wonder and curiosity in science, giving children the opportunity to develop and explore their own scientific wonderings.

Our Science Principles

- Children are asking and researching their own questions
- Children come up with how they are going to find answers and what the significance is of their discoveries
- Children are engaged in their own learning
- Children are taking part in practical activities
- Children are taking part in activities that are relate to their life experiences
- Children are not following a pre-set scheme ... we are extending children's questions or interests as they come about

Our School Development Plan 2014-2015

Curriculum 2014-15 Overview: To adapt the VISION of Curriculum 2014 to meet the requirements of the school's aims and golden principles.

Through our own trials and using research such as Sutton and Hattie's reports we believe the following 'Key Aspects of Learning' have the greatest influence on learning. Attainment and skills awareness is raised through:

Staff's pedagogical trials and research

Metacognition

Assessment for learning

Creating assessment literate children

Collaborative learning

Real engagement in learning (children with clarity as to why they are learning) Personalising the curriculum (children having input into what they are learning) Enabling children to adapt to problems and life situations

A2 There is a clear vision for the teaching and learning of science

A3 The current School Development Plan has appropriate and active targets for Science

BRADSHAW HALL PRIMARY SCHOOL

DEVELOPMENT PLAN 2014-2015 FOR CURRICULUM 2014

Science

The school aim to achieve the Primary Science Quality Mark silver award. There have been many successful science trials run in the school – the outcrop of these trials is that we have identified the following model for improving learning outcomes in science:

- Have powerful, practical contexts for immersing children in areas of study
- Develop schemes of work based around children's questions, areas of interest or misconceptions based on the initial immersion
- Make active use of assessment for learning to plan science activities (including practical activities) built around the children's needs.

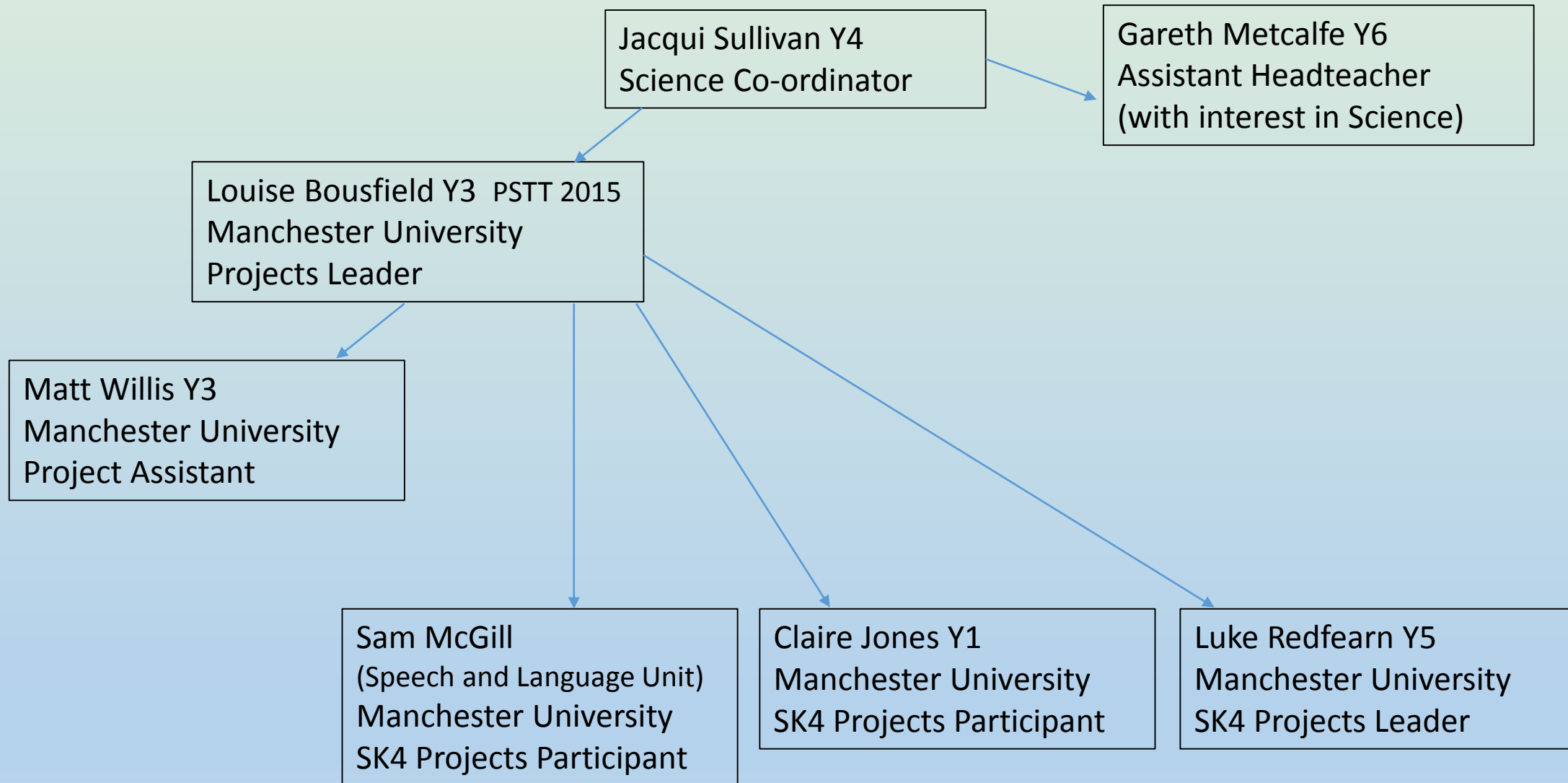
We will also increase the awareness and exposure of children to science. There will be an upper KS2 school trip to Jodrell Bank, and the science coordinator will increase the parents' awareness of Science at Bradshaw Hall. Teachers will be part of local science projects to develop science teaching across all key stages. These teachers will be used to drive the professional development of science throughout the school.

Led by Jacqui Sullivan

Science trials run by Louise Bousfield and Matt Willis. Jacqui has asked Lynne Bianchi that Sam McGill (Speech and Language Centre and Clare Jones Y1) join the SK4 science project.

A2 There is a clear vision for the teaching and learning of science

Bradshaw Hall Science Family Tree



Science Displays



A4 Science displays around the school show how science is valued and enjoyed

C3 Children enjoy their science experiences in school

D1 Science supports other curriculum areas and contributes to maximising whole school initiatives while retaining its unique status

Whole School Science Competition

THE BRADSHAW HALL SCIENCE COMPETITION

3 amazing Science prizes for winners!

All entries need your name and class written or attached. Give your entry to Miss Sullivan or ask your teacher to pass it on.

HAVE LOTS OF SCIENTIFIC FUN!

The subject leader organised a school wide competition to engage children in Science outside the school domain. Children were encouraged to visit MOSI, or to take part in an experiment with parents as Science assistants!

All you have to do is prove that you did something scientific outside school.

It's all about the EVIDENCE!

This could be:

- * A ticket/leaflet to a Science Museum (MOSI, for instance). You could say what was your favourite part of the Museum ☺
- * A drawing/photo of an investigation/experiment you did at home
- * A Scientific fact sheet about something that you're interested in, for example, Food Chains or the Solar system
- * A profile of your favourite scientist

As long as it's proof you did something to do with Science!

Entries need to be in by **Friday, 16th January 2015**. A special Science assembly will be held the following week revealing the winners.



A1 There is an effective subject leader for Science

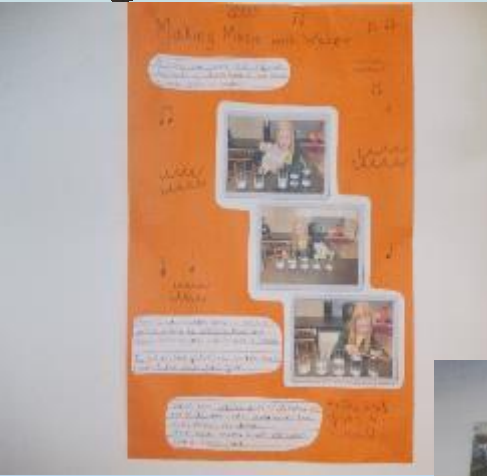
A4 Science is valued as a subject

C1 Pupils are actively engaged in their own learning and achievement; making decisions, answering their own questions, solving real problems

C3 Children enjoy their science experiences in school



Phenomenal response to the competition!



Whole School Science Competition



The Bradshaw Hall Science Competition 2015 **Chris Bagnall (HT) and Lynne Bianchi**

A1 There is an effective subject leader for Science

A4 Science is valued as a subject

C1 Pupils are actively engaged in their own learning and achievement; making decisions, answering their own questions, solving real problems

C3 Children enjoy their science experiences in school

There is an effective subject leader A1 A4 A5 C1 C3

MANCHESTER
1824
The University of Manchester

Miss Sullivan

http://www.fascinate.manchester.ac.uk/about-us/news-and-events/

News and events | The Univ...

Quotes taken from:
<http://www.fascinate.manchester.ac.uk/about-us/news-and-events/>

• Bradshaw Primary School's 2015 Science Competition Winners, with Dr Lynne Bianchi and Head teacher, Chris Bagnall.

Dr Lynne Bianchi commended the work lead by Jacqui Sullivan, Science Subject Leader, saying, "It was thoroughly invigorating to see the high quality science investigations the children had come up with - all credit to a school who has really put science at the heart of their whole school innovations!".

Get in touch if you'd like us to help you run your own Primary Science events in your region: lynne.bianchi@manchester.ac.uk.

Events we regularly host or attend:

- The University of Manchester's Science Spectacular - October/November
- The Science and Engineering Education Research and Innovation Hub's Children-to-Children Conference, June/July
- Conferences and Events in conjunction with the Primary Science Teaching Trust
- The International Symposium on Engineering Education

25/11/2015

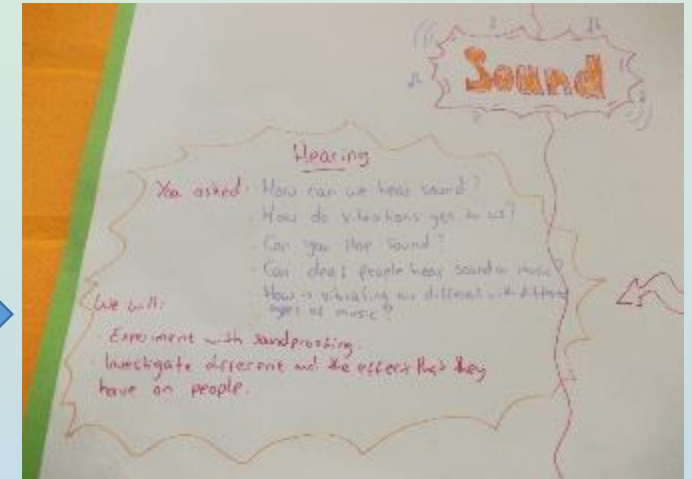
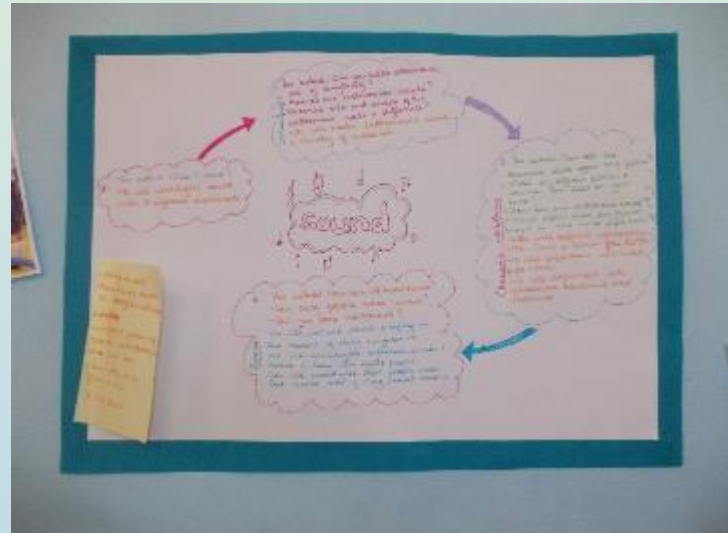
'...all credit to a school who has really put science at the heart of their whole school innovations!'

Dr Lynne Bianchi 'commended the work led by Jacqui Sullivan' (A1)

'...invigorating to see high quality Science investigations!'

Planning by children's questions Y3/4

Bradshaw Hall is driving to *personalise* the science curriculum by children having a real input into what they want to learn. Teachers still ensure that required learning objectives are covered but children discuss what and when to learn an area.

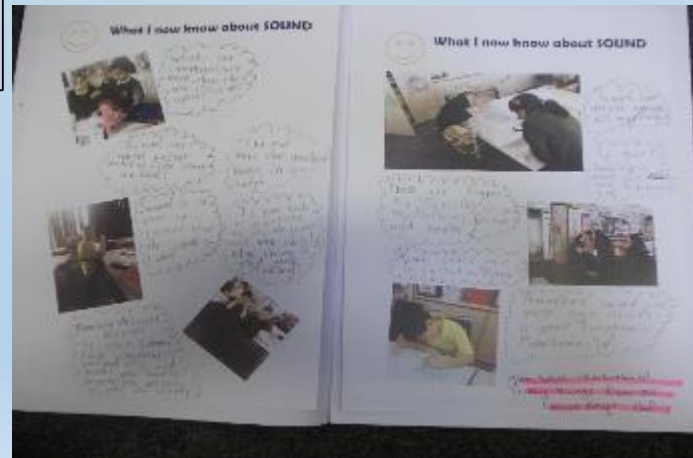


Y3/4 Sound Topic Question stage

Planning stage

Focused planning stage

Assessment and Reflection stage



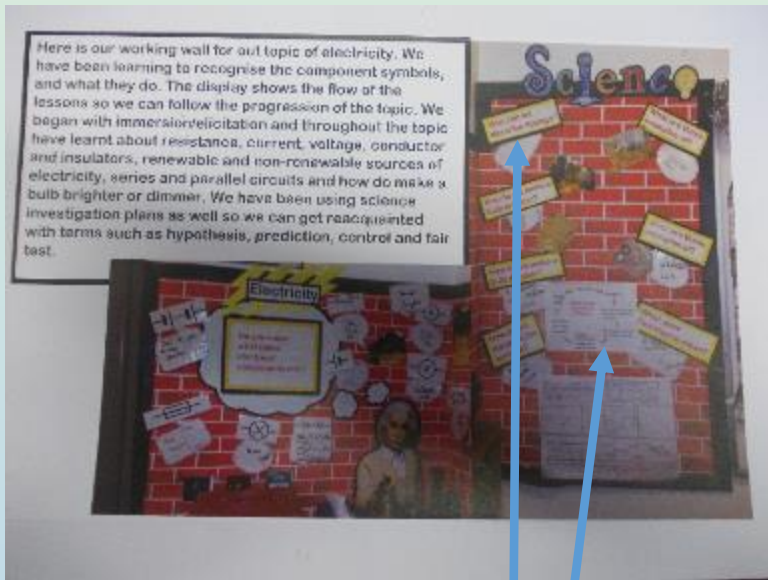
Immersion stage (eg .. The Liverpool Philharmonic Orchestra)

D1 Science supports other areas D2 Links to outside agencies to enrich Science

- A2 Vision for teaching and learning Science taking place in the classroom
- A4 Science is valued
- B2 Range of teaching and learning approaches
- C1 Children actively engaged in own learning
- C2 Teachers using a range of assessment approaches
- C3 children enjoy their science experiences

Planning by children's questions Y5

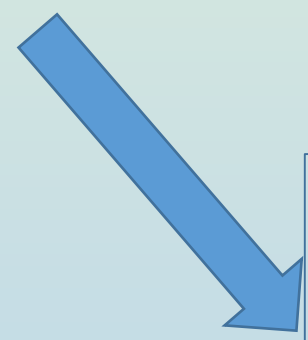
Bradshaw Hall is driving to *personalise* the science curriculum by children having a real input into what they want to learn. Teachers still ensure that required learning objectives are covered but children discuss what and when to learn a topic.



Y5 Electricity Topic Questions and flow chart of planning



Immersion

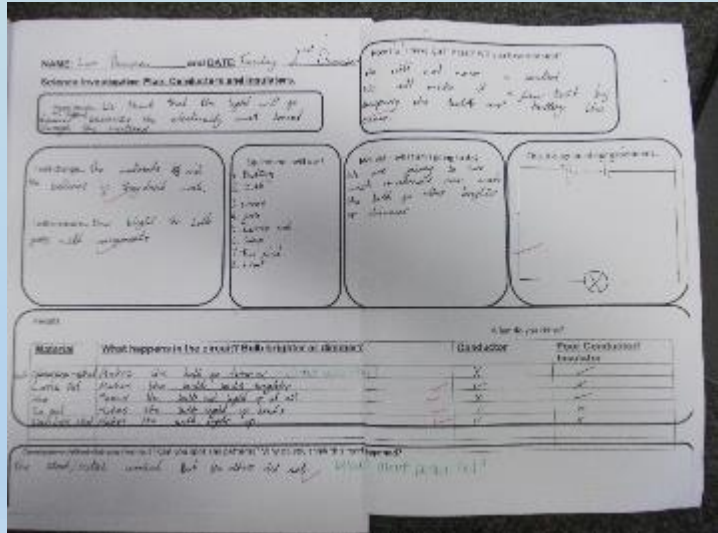


Planning and further investigating

I know how to make a parallel switch. I know that there are different voltage of batteries.



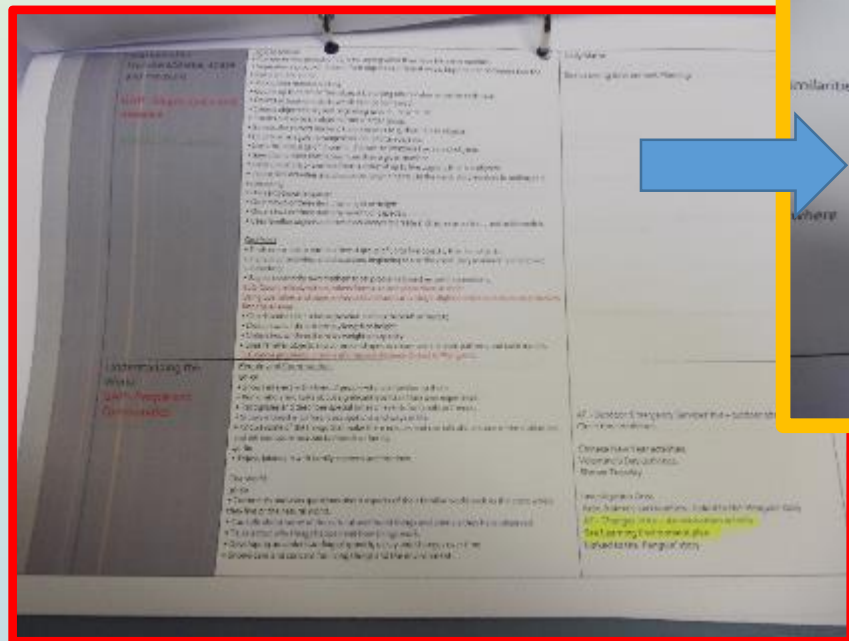
Assessment and Reflection



D1 Science supports other areas ...

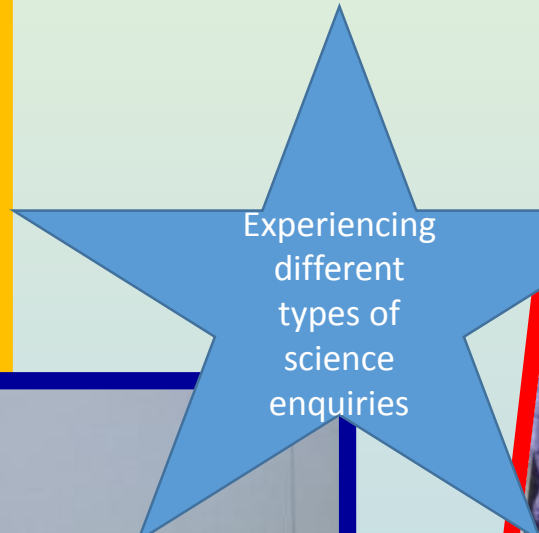
- A2 Vision for teaching and learning Science taking place in the classroom
- A4 Science is valued
- B2 Range of teaching and learning approaches
- C1 Children actively engaged in own learning
- C2 Teachers using a range of assessment approaches
- C3 children enjoy their science experiences

EYFS ●●●● an example of Topic / Medium planning (also an example of Outdoor Environment Science)



Similarities:
AF - Outdoor 'Emergency Services' hut – outdoor observations
Circle Time Activities.
Chinese New Year activities.
Valentine's Day activities
Shrove Tuesday

Where:
Investigation Area
Arctic Animals and habitats – linked to the 'Penguin' story
AF - Changes in ice – ice excavation activity
See Learning Environment plan
Linked to the 'Penguin' story



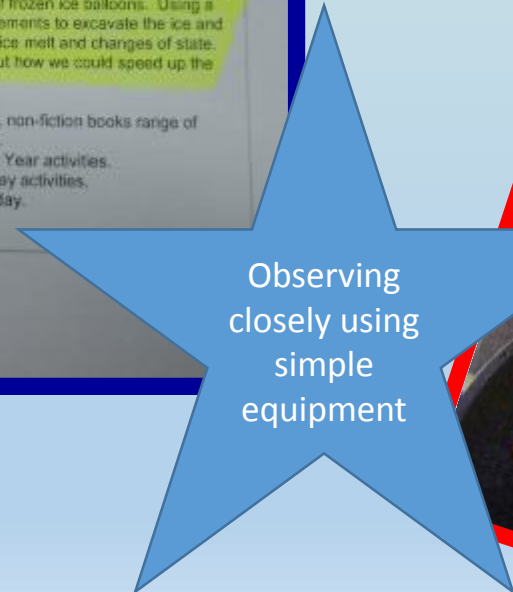
experiences:
• Plays cooperatively as part of a group to develop and act out a narrative. (EAD/MM 40-60)

INVESTIGATION
• Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.
• Can talk about some of the things they have observed such as plants, animals, natural and found objects. (UW/TW 30-60)
• Looks closely at similarities, differences, patterns and change (UW/TW 40-60).

Enhance Autumn Investigation area with Autumn books (fiction and non-fiction). Winter picture making with twigs, snowflakes, snowballs, glass beads and pom poms.

Ice excavation activity – exploring how to get animals out of frozen ice balloons. Using a range of implements to excavate the ice and watching the ice melt and changes of state. Thinking about how we could speed up the process.

Winter words, non-fiction books range of labels, books.
Chinese New Year activities.
Valentine's Day activities.
Shrove Tuesday.



In Early Years children explored how they could get an animal out of a frozen balloon.

A5 The SL knows about the science teaching and learning across the school

B2 There is a range of teaching and learning approaches

C1 All pupils are engaged

C2 Teachers are using a range of assessment approaches

C3 Children enjoy their science experience in school

D1 Science supports other curri

OBSERVATION		
Name: Chloe		
Date: 26.1.15		
Observer: B2		
Area: cactobots		
Child initiative / Adult-led Activity		
Grouping:		
Photo: Yes / No		
What is happening? / What is the child doing or saying? Children popping the frozen ice balls to reveal a creature. Chloe said "There are balls more in the freezer" like "weather" had to be warm for the ice to melt, if you leave the water in there (points to the water tray) it will turn to ice because its very cold."		
Characteristics of Learning:		
Playing and Exploring	Active Learning	Creating and thinking
'Engagement'	'Motivation'	critically 'thinking'
Showing Curiosity	Motivated	Thinking of ideas
Exploring	Enthusiastic/Excited	Problem Solving
Using Senses	Making choices	Adapting/Changing
Engaged/Focused	Persevering	Predicting/Estimating
Showing specific interests	Attentive/focused	Ordering/sequencing
Risk taking	Confident	Describing
Engages in new activity	Shows pride	Planning
Role play/Imaginative Play	Energetic	Evaluating
Joining in and taking part	Enjoys achieving	Collaborative Play

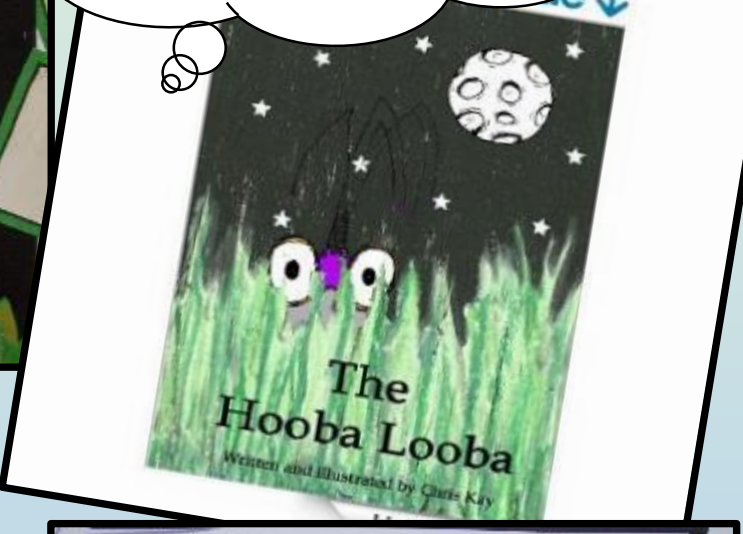
Year 1 Cycle 1 planning of 2 cycles

Bradshaw Hall Primary School
KS1 Topic Yearly Overview
Overview of Science in Year 1
Science in Year 1 enables children to experience and observe the world around them. Children are encouraged to be curious and begin to ask questions about what they notice. We help them to develop scientific ideas by finding different ways to answer their own questions, observing changes over time, grouping things and carrying out simple tests.

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1 Cycle 1	Around the World		Let's Play (Loss)		Beasts (On Sea)	
Science content	Animals including humans (link to continents) • Identify and name a variety of common animals (incl fish, amphibians, reptiles, birds and mammals) • Identify and name a variety of common animals that are carnivores, herbivores, omnivores • Describe and compare the structure of a variety of common animals. Seasonal changes (ongoing) • Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies.		Everyday Materials • Distinguish between an object and the material from which it is made • Identify and name a variety of everyday materials (incl wood, plastic, glass, metal, water and rock) • Describe 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		Plants • Identify and name a variety of common wild and garden plants (incl deciduous and evergreen trees) • Identify and describe the basic structure of a variety of common flowering plants (incl trees) Animals including humans (link to sea creatures) • Identify, name, draw and label basic parts of human body and link to senses.	
Science skills	• Asking simple questions and recognizing 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					



Have you ever wondered how the stars stay so bright? Or how the grass keeps its greeny green?



Author visit: Chris Kay visited Year 1 to enrich their Science topic of Animals around the World

- A5 The SC knows about Science teaching and learning across the school
- B2 There is a range of teaching and learning approaches
- C1 All pupils are actively engaged
-
- C2 Teachers are using a range of assessment approaches
- D1 Science supporting Literacy
- D2 Author enriching Science

Animals, including humans	<ul style="list-style-type: none"> know about similarities and differences in relation to living things make observations of animals and plants and explain why some things occur, and talk about changes.
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<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (including pets) Identify and name a variety of common animals that are carnivores, herbivores and omnivores

Year 1 Science Topic: Science Assessment	<ul style="list-style-type: none"> How well children and differently abled children observe, identify, describe and group things The children's links of their observations with their own ideas and how they are able to They have observations of animals and plants and explain why some things occur, and talk about changes
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Identifying and naming a variety of common animals, including fish ...

Name: MIAA Date: 11.11.14

Classifying Animals

Amphibians		Birds	
Fish		Reptiles	

Assessment documents:
Emerging, Expected, Exceeding

Year 1 Cycle 1 planning of 2 cycles

Bradshaw Hall Primary School		
Subject	Learning Objective	Success Criteria
Science	<ul style="list-style-type: none"> To sort toys according to whether float or sink. To make a prediction and take part in a scientific experiment. 	<ul style="list-style-type: none"> I can group a toy according to whether it will float or sink. I can make a prediction. I can take part in a scientific experiment.
Task / Activity		
<p><u>Lesson 1 - See Flipchart</u></p> <p><u>Introduction:</u> Explain that we are looking at answering another of our questions 'What do we want to learn about toys' questions.</p> <p>Which toys float?</p> <p>Sort pictures toys into toys that they think will float and sink. Introduce the idea of making a prediction.</p> <p>Introduce worksheet activity.</p> <p><u>Activity:</u> Children complete worksheets. (Lego, paper aeroplane, puppet, old wooden toy, bouncy ball, metal toy)</p> <p>Draw toys into the different categories according to whether they think it will float or sink. Chn can record in their own way if they want to.</p> <p>Then after play children test the toys.</p> <p><u>Lesson 2</u></p> <p><u>Introduction:</u> Continue to think about the question Which toys float? Recall expt and discuss which toys floated and which sank.</p> <p>Chn record findings on sheet and check if their predictions were correct.</p> <p>Back to discussion with TA. Can they notice anything regarding which materials float and which materials sink.</p> <p>Then they need to write sentences to draw a conclusion about which type of toys float and which sink. Then see if they can use any scientific descriptions about why that is the case, eg waterproof, absorbent, heavy, light etc.</p>		

Success Criteria		Assessment Opportunity
<ul style="list-style-type: none"> I can group a toy according to whether it will float or sink. I can make a prediction. I can take part in a scientific experiment. 	<ul style="list-style-type: none"> Worksheets Questioning Observations 	
Task / Activity	Notes for Future Planning	
<p>Introduction: Explain that we are looking at answering another of our questions 'What do we want to learn about toys' questions.</p> <p>Sort pictures toys into toys that they think will float and sink. Introduce the idea of making a prediction.</p> <p>Introduce worksheet activity.</p> <p><u>Activity:</u> Children complete worksheets. (Lego, paper aeroplane, puppet, old wooden toy, bouncy ball, metal toy)</p> <p>Draw toys into the different categories according to whether they think it will float or sink. Chn can record in their own way if they want to.</p> <p>Then after play children test the toys.</p> <p><u>Lesson 2</u></p> <p><u>Introduction:</u> Continue to think about the question Which toys float? Recall expt and discuss which toys floated and which sank.</p> <p>Chn record findings on sheet and check if their predictions were correct.</p> <p>Back to discussion with TA. Can they notice anything regarding which materials float and which materials sink.</p> <p>Then they need to write sentences to draw a conclusion about which type of toys float and which sink. Then see if they can use any scientific descriptions about why that is the case, eg waterproof, absorbent, heavy, light etc.</p>	<p>Draw comparisons between what we found and materials list: sink.</p> <p>Chn need more work on why things float/sink. Lo except for Ben, who think Benji, Lego</p>	

Which toys float?

Toy	Prediction	What happened?	Material
PUPPET	float	float	fabrik
car	SINK	SINK	metal
lego	float	float and sink	Plaste
rubber	sink	SINK	rubber
block	SINK	float	wood
PLAEN	float	float and sink	paper

What did you notice about which objects floated and which sank?
 The wood did float because it was light.
 The car and lego were sink because 1st metal and metal is heavy.

Predicting, gathering and recording data to help in answer questions (D1 cross curricular with Maths)

- A5 The Science co-ordinator know about science teaching and learning across the whole school
- B2 There is a range of teaching and learning approaches for Science
- B3 There is a range of up to date quality resources
- C2 Teachers are using a range of assessment approaches
- D1 Science supports and links with other curriculum area

Notes for future planning and assessment notes

Year 2 investigation

Senses Investigations

What are we learning today?

- To choose ways in which you might answer scientific questions.
- To make sensible predictions.
- To use simple scientific language.
- To be aware of the concept of a fair test.

Success Criteria

- To answer simple questions and predict what might happen.
- To contribute sensibly to group work.
- To suggest ways in which an investigation could be made fair.
- To offer alternative ideas.

What is the best material for blocking sound?

How far can we see?

Can I recognise someone by their smell?

What do I want to investigate about senses?

Which materials are the smoothest?

What sort of tastes do we prefer?

What do I want to investigate about senses?

Individual activity

Whole class activity

Teachers use a range of teaching and learning approaches for Science. Here is evidence of whole, group and individual learning. At the heart of this activity is the SDP where children raise the questions (A2 A4 A5 B2 B3 C1 C2 C3)

Science Planning Trail

What do we want to find out?

What are we going to do?

What will we use?

What do you think will happen?

How will we make it fair?

What did you find out?

Whole class activity

I found out that you can recognise your family by their smell and recognise their clothes.

Individual activity

Whole class activity

Can We Recognize People By Their Smell?

Name	Who do you recognise?	Number of correct person	Right or Wrong?
Alice	X V X X X	2	0
John	X X X X X	4	0
Rainier	X X X X X	1	0
Anna	X X X X X	3	0
Total number children who chose correctly			

Individual activity



Group work activities

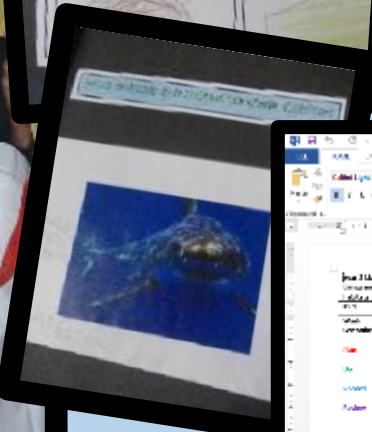
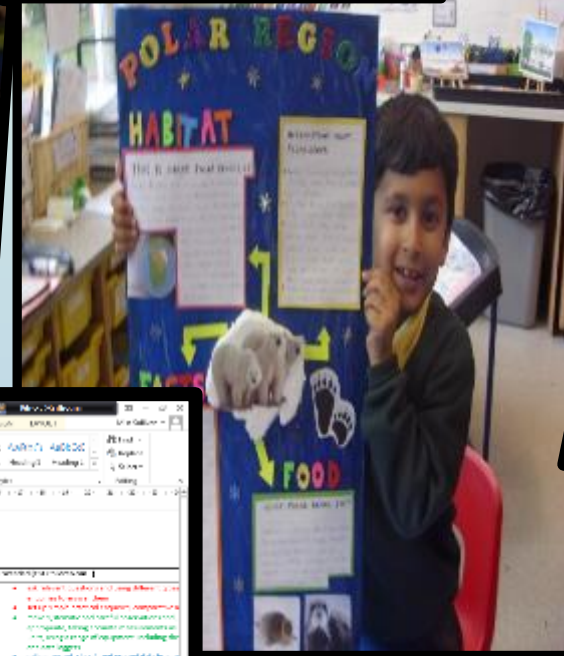
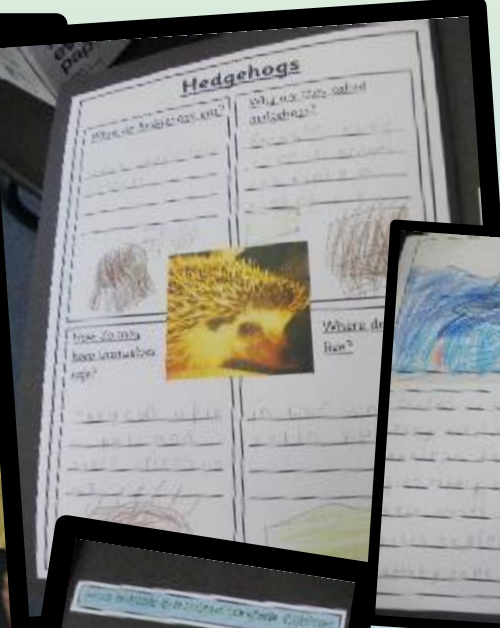
Year 2
Habitats

'Real engagement in learning ...'
extract from SDP 2014-2015

Class work and homework
projects A5 B1 B2 C2 C3
D1



Miss McCauley (NQT) brought in her pet hedgehog



Progression scales used for assessment

Year 2 Learning Objectives	Progression Scale 1	Progression Scale 2	Progression Scale 3
Identify the main parts of a habitat.	Identify the main parts of a habitat.	Identify the main parts of a habitat.	Identify the main parts of a habitat.
Describe the main parts of a habitat.	Describe the main parts of a habitat.	Describe the main parts of a habitat.	Describe the main parts of a habitat.
Explain the main parts of a habitat.	Explain the main parts of a habitat.	Explain the main parts of a habitat.	Explain the main parts of a habitat.



Year 3 / 4

Subject Science Sound

Tasks

Children will answer the question 'what is sound?' by taking part in a carousel of investigations.

1. Blow the candle out with sound vibrations
2. Make rice vibrate by playing a loud instrument nearby
3. Listen to sound waves as they travel through solid materials into the ear.

The children will record their findings at each station in their science books using pictures, labelled diagrams and key scientific words.

Extension : Do children notice a difference in the vibrations between different materials? Which are best conductors of sound? Which areas of the school are the noisiest and what affect does that have on the vibrating rice?

Learning Intention

To answer the question 'what is sound'.

To establish that sound is caused by vibrations.

To recognise that sound travels through a medium to the ear.

Resources

Lengths of pipe, tea light candles and matches, balloons, safety mats for candles.

Coat hangers, string, a variety of metal and non-metal objects

Large bowls, rice, clingfilm, drum or tambour

Assessment opportunities

Do children make links with prior learning? Do they apply knowledge to the new situations? Do they ask further questions to be investigated? Do they explain clearly how the investigation is showing what it is.



Led by Mrs Bousfield (PSTA 2015) pupils were encouraged to investigate the questions 'What is Sound?' Children took part in a range of activities eg blowing out a candle, making rice vibrate on a drum, children had to note their observations in Science journals. Children then had to report what they had found out to the rest of the class.

A2 There is a clear vision for the teaching and learning of science

A4 Science is valued as a subject

A5 The SL knows about the Science teaching and learning

B1 Staff continue to have opportunities for CPD

B3 There is an up to date range of resources

C1 All pupils are actively engaged in their own learning...

C3 Children enjoy their science experiences in school

D1 Science supports and links with other curriculum areas (music and D&T here)

D2 There are clear links other outside agencies (PSTA)

'Through rich experiences, children will learn about the knowledge, processes and uses of science in the modern world.' Bradshaw Hall Science vision 2014

Year 4 taking ownership of their learning!



We organised our own Sound lessons. We did this by asking questions and discussing what was important to learn this year!

See slide 3 A3

I didn't know that whales can communicate 100 miles apart

The orchestra visit was fun

I loved making my loud hailer!

C1 C2 C3

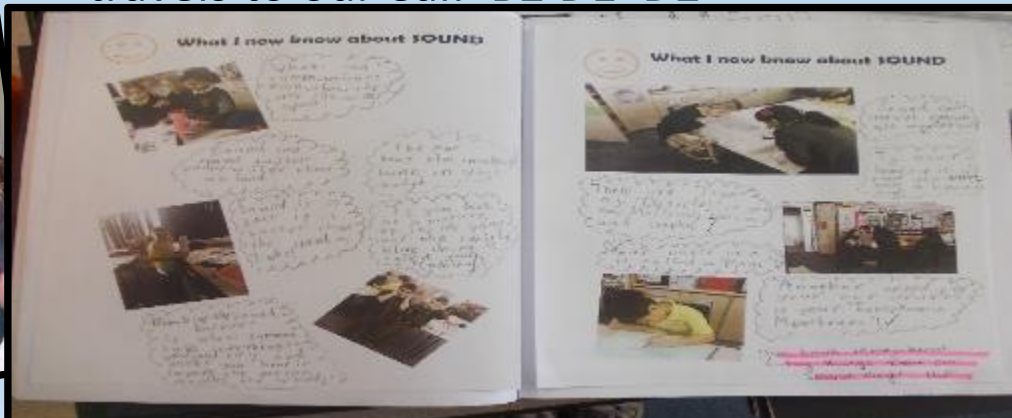
How does sound travel?

What does a vibration look like close up?

Can sound travel under water?



The Liverpool Philharmonic Orchestra visited us to explain how we hear music, how sounds can be made higher and lower, plus they explained how sound travels to our ear. B2 D1 D2



Year 5 and 6

(led by Gareth Metcalfe AztraZeneca Science Teaching Trust Keith Bishop Award 2011)

In Years 5 and 6 activities are designed to develop children's skills in scientific investigation and to encourage them to use those skills in furthering their knowledge and understanding. Furthermore, investigations tend to be more open ended, children have to justify and agree on choices, use scientific language and co-operative behaviour as the norm.

YEAR GROUP	5 and 6 Cycle 1	YEARLY PLANNER		
	AUTUMN	SPRING	SUMMER	
Being a Scientist During the first few weeks, we introduce what it means to be a scientist in various scenarios.	Electricity We introduce electricity in a range of ways, immersing them in different uses of electricity. We experiment with conductivity as well as troubleshooting incomplete circuits.	The Human Condition In this module, we will carry out an extended scientific enquiry measuring and analysing human behaviour. It was a project that was pioneered by the Primary Science Teaching Trust at Bradshaw Hall as a vehicle for running extended scientific enquiries.	Properties and Changes of Materials During this term will investigate properties of their materials through real life examples including: the best way to insulate an ice-lolly solubility of biscuits.	Living their H Through and di discer of anir their f
We learn to:	We learn to:	We learn to:	We learn to:	We lea
plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	think creatively to try to explain how living and non-living things work, and establish links between causes and effects	compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets	descri things into b
take measurements, using a range of scientific equipment, with increasing accuracy and precision	compare and give reasons for variations in how components function, including the brightness of bulbs and the loudness of buzzers	ask questions that can be investigated scientifically and decide how to find answers	know that some materials will dissolve in liquid to form a solution,	descri differ life cy mann amphi insect and cl
record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs	make systematic observations and measurements	make systematic observations and measurements	know how mixtures might be separated, including through filtering, sieving and evaporating	descri repro anima
use test results to make predictions to set up further comparative and fair tests	use their scientific knowledge and understanding to explain observations, measurements or other data and conclusions	use their scientific knowledge and understanding to explain observations, measurements or other data and conclusions	give reasons, for the particular uses of everyday materials,	Anima humas becom with t system
report and present findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations			demonstrate that dissolving, mixing and changes of state are reversible changes	recogn impact quiet, exercise, drugs and lifestyle on the way their bodies function
identify scientific evidence that has been used to support or refute ideas or arguments.			explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	describe the ways in which nutrients and water are transported within animals, including humans.



'Have powerful, practical contexts for immersing children in areas of study...'
School Development Plan 2014/15

Year 5 and 6 (led by Gareth Metcalfe AztraZeneca Science Teaching Trust Keith Bishop Award 2011)

Philosophy in Science developed by Gareth and now taught by Y5 & Y6 teachers



Dear Associate Member,
 Thank you for attending our meeting at the 'Bureaux for Scientific Development'. We appreciate your input, and are glad to receive your support and advice on a range of different issues that affect our work. We would like to ask you to fill in the following questionnaire, so that we can formally record your opinions on the matters discussed. Please explain your opinions as fully as you can. Any additional comments that you would like to make regarding our work would be gratefully received - Science Development Team

Should we continue to invest in space travel?
 I don't think that people should put an investment on space travel because if you think of the health side of things and ebola crises ^{and} if it came over in the UK or America we would want to find a cure urgently. ^{Does it have to be or the UK?}
 Are there some questions that the science community cannot, or

can't answer
 questions because if ~~it~~ ^{it} ~~is~~ ^{is} about questions ~~we~~ ^{we} ~~started~~ ^{started} before the world started? And also what before god created
 Also did God create the world?

- A4 Science is valued as a subject
- A5 The Science co-ordinator know about the Science teaching
- B1 Staff continue to have opportunities for CPD
- B2 There is a range of teaching and learning approaches
- D2 There are clear links to outside agencies/organisations

Title - Cialdini, Vincent, Lewis, Catalan, Wheeler & Darby (1973). Reciprocal concessions procedure for inducing compliance: The door-in-the-face technique. *Journal of Personality and Social Psychology* 31(2), 206-215.

Hypothesis - the way that you ask people to do something affects whether they will do it or not.

Investigation - A group of students were asked if they would help out at a kids' camp for two hours per week for two years. They all said no. They were then asked if they would supervise a single two-hour trip, and half said yes. A second group were asked to help out on the same single two-hour trip, but this group had not been asked to help out before. Only 17% of them agreed to help out.

Conclusion - ~~When people know what the outcome is, they are more likely to take the better offer.~~
 When people know what the outcome is, then they are offered something better, they are more likely to take the better offer.

but the sun will have the gravitational pull, ^{gravitational pull,} so that ~~it~~ ^{it} ~~is~~ ^{is} ~~not~~ ^{not} ~~possible~~ ^{possible} ~~to~~ ^{to} ~~have~~ ^{have} ~~it~~ ^{it} ~~be~~ ^{be} ~~completely~~ ^{completely} ~~different~~ ^{different}.

2. The second reason is the tides - a right way ~~to~~ ^{to} ~~be~~ ^{be} ~~much~~ ^{much} ~~danger~~ ^{danger} because the sun ~~is~~ ^{is} ~~not~~ ^{not} ~~able~~ ^{able} ~~to~~ ^{to} ~~reflect~~ ^{reflect} on the moon.

Great work Hannah.
 You've shown a high level of understanding.

Teachers use this grid in their planning, and to monitor the children's progress with Working Scientifically

Working Scientifically ~ Pupils are not expected to cover each aspect for every area of study

Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
explore the world around them and raise their own simple questions	raise their own relevant questions about the world around them	use their science experiences to explore ideas and raise different kinds of questions
experience different types of science enquiries, including practical activities	should be given a range of scientific experiences, including different types of science enquiries to answer questions	talk about how scientific ideas have developed over time
begin to recognise different ways in which they might answer scientific questions	start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions	select and plan the most appropriate type of scientific enquiry to use to answer scientific questions
carry out simple tests	Set up simple practical enquiries, comparative and fair tests recognise when a simple fair test is necessary and help to decide how to set it up	recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why
use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)	talk about criteria for grouping, sorting and classifying; and use simple keys	use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment
ask people questions and use simple secondary sources to find answers	recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact
observe closely using simple equipment with help, observe changes over time	make systematic and careful observations help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used	make their own decisions about what observations to make, what measurements to use and how long to make them for
with guidance, they should begin to notice patterns and relationships	begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them	look for different causal relationships in their data and identify evidence that refutes or supports their ideas
use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data	take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately	choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate.
record simple data	collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data	decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
use their observations and ideas to suggest answers to questions talk about what they have found out and how they found it out	with help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.	identify scientific evidence that has been used to support or refute ideas or arguments
with help, they should record and communicate their findings in a range of ways and begin to use simple scientific language	use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions	use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results
	with support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	use their results to make predictions and identify when further observations, comparative and fair tests might be needed

September 2013

Produced by CIEC

www.ciec.org.uk

A5 The SL knows about Science teaching and learning across the school
C2 Teachers are using a range of assessment approaches

Science curriculum folder with Assessment/Progression

Learning Resources

My Work

Miss Sullivan

Staff Shared Files > Curriculum 2014 > SCIENCE

Name	Date modified	Type	Size
New Science vocab for 2014	09/02/2015 10:04	File folder	
Peer Assessments	09/02/2015 09:59	File folder	
Progression Table	09/02/2015 10:10	File folder	
Comparison_of_old_and_new_primary_sc...	09/02/2015 10:02	Microsoft Word D...	59 KB
key-stage-one-individual-pupil-science-...	18/11/2014 08:09	Adobe Acrobat D...	303 KB
lower-key-stage-2-individual-pupil-scienc...	18/11/2014 08:11	Adobe Acrobat D...	312 KB
Progression_Grid_Working_Scientifically_...	09/02/2015 10:01	Adobe Acrobat D...	99 KB
Year 1 Animals, including humans progr...	10/11/2014 09:45	Microsoft Word D...	16 KB
Year 1 Everyday materials progression an...	10/11/2014 09:46	Microsoft Word D...	16 KB
Year 1 plants progression and assessmen...	10/11/2014 09:45	Microsoft Word D...	16 KB
Year 1 Seasonal changes progression and...	10/11/2014 09:47	Microsoft Word D...	16 KB
Year 2 Animals, including humans progr...	10/11/2014 09:45	Microsoft Word D...	16 KB
Year 2 Living things in their habitats prog...	10/11/2014 09:45	Microsoft Word D...	17 KB
Year 2 plants progression and assessmen...	10/11/2014 09:46	Microsoft Word D...	16 KB
Year 2 Uses of everyday materials progres...	10/11/2014 09:46	Microsoft Word D...	17 KB
Year 3 Animals including humans progres...	10/11/2014 09:47	Microsoft Word D...	17 KB
Year 3 Forces and magnets progression a...	10/11/2014 09:49	Microsoft Word D...	17 KB
Year 3 Light progression and assessment ...	10/11/2014 09:40	Microsoft Word D...	17 KB
Year 3 plants progression and assessmen...	10/11/2014 09:48	Microsoft Word D...	17 KB
Year 3 Plants proaression and assessment	10/11/2014 09:35	Microsoft Word D...	17 KB

41 items

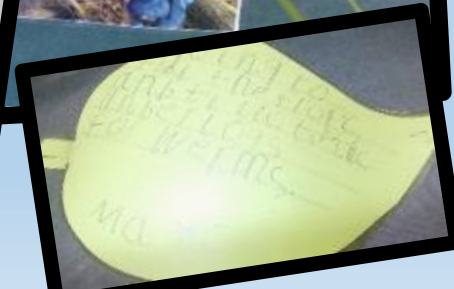
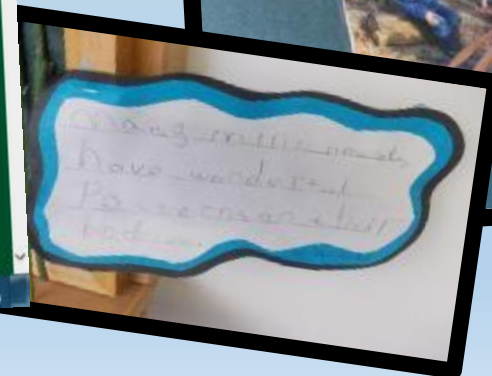
08:26
13/02/2015

A5 The Science subject leader knows about the science teaching and learning across the school

C2 The purpose of assessment is understood Assessment is designed to fit those purposes.

Outdoor Environment

KS1 and Ks2 both have enrichment lesson using the forest area in the school. This is taken by **Schola Foris**. All teachers use the field, garden and forest areas for Science lessons. B2 B3 C1 C3 D1 D2





B1 D1 D2 There are clear links to other schools and outside agencies

Jacqui Sullivan, Gareth Metcalfe and Kerry Walmsley took part in a Top Marks project working with Sheffield Hallam University. We also worked with Grenoside Primary School, Sheffield, Montenevy Primary School, Sheffield, Orrishmere Primary School, Stockport. Together we exchanged experiences of our Science teaching. We devised lessons that would be context rich and truly engage children in Science learning and assessment. The lessons have now been published by Top Marks.



How are we sharing Science with others? D2

Gareth Metcalfe is our Assistant Headteacher working in Year 6. He primary co-ordinates Maths but has a huge interest in Science. In 2011 he won the Keith Bishop Primary Science Teaching Award run by Aztra Zeneca. Gareth continues to be Involved in Science projects working with Sheffield Hallam University and Manchester University. Often Gareth is working with placement MA students specialising in psychology (next slide).

To: Baker Robert; kashifhaque@btinternet.com
Subject: Involvement in 'The Human Condition' project

Hi,

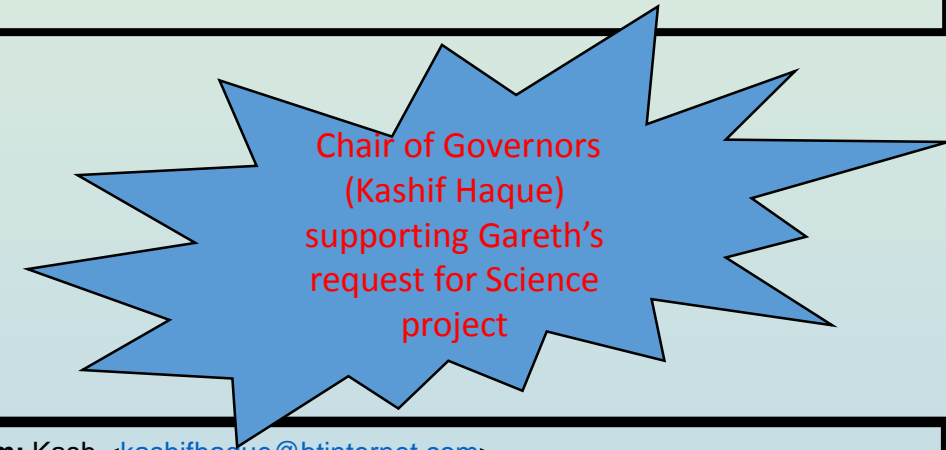
This is Gareth From Bradshaw Hall. I am emailing to see if you would be interested in getting involved in a science project that I am running at the moment. I know that Sinead had mentioned last week that she was keen to strengthen the link between governors and the teaching / teachers at BHPS, which I thought was a great idea.

The project, called The Human Condition and funded by the AstraZeneca Science Teaching Trust, aims to bring psychology to the primary classroom. In my opinion, science in school can easily become somewhat linear and restricted. Children are asked to make straightforward links between cause and effect, and therefore struggle to appreciate that scientists don't actually work in a world of black and white facts. They can see science as being about them learning scientific facts, and they aren't (in my opinion) exposed to the complexity of what it means to work as a scientist. The Human Condition project plans to address this directly.

After an in-depth study of basic psychological concepts, the children are at the moment in the process of designing their own 'human condition' experiments, investigating the factors that affect human behaviour. On Wednesday 6th March (1:30pm - 3pm) they will have to pitch their experiment ideas to a panel of people (including an MMU lecturer). The panel will then decide which of the investigations we will run. I would be delighted if we could have a member of the governing body to be a part of that panel, and I thought that I would ask you two first.

If you want to know any more about the project, I am happy to give you any more details. Otherwise, it was great to have your input on the ICT initiatives, and I'm sure I will see you soon.

Gareth



From: Kash <kashifhaque@btinternet.com>
Date: 26 February 2013 12:46:01 GMT
To: Baker Robert <Rob.Baker@uk.fujitsu.com>
Cc: Gareth Metcalfe <gareth.metcalfe@hotmail.co.uk>
Subject: Re: Involvement in 'The Human Condition' project

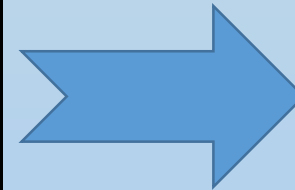
Hi Gareth,

Thanks for the e-mail. I think it is a great idea and having done a science based degree agree with what you say.

I have managed to move some things in my diary and am pleased to say that I will be able to come and join you on the 6th March. Let me know if there is anything you need me to do beforehand.

Kind regards

Kash



How are we sharing Science with others? A4 B1 D2



Gareth's project published in Primary Science 2012.

Gareth working with MA student to produce final dissertation

From: Eszter Toth [eszter_toth93@hotmail.com]
Sent: 30 October 2013 16:30
To: Gareth Metcalfe
Subject: dissertation

Request to work with Gareth

Hi Gareth,

I hope you're well. Over the past few months I've been working on my dissertation idea (which is exploring children's understanding of mental health) and my proposal is almost ready. I was just wondering if I would still be okay to carry out my project in Bradshaw Hall after the Christmas holidays?

Also, in about 2 weeks time I should have everything ready (such as the consent forms, information sheets for parents and the activity timetable) so I can show you what I would like to do and I would like to ask for your opinion in a few things as well. Could you please let me know when is the best time for me to discuss this with you?

Thank you and best wishes
Eszter

From: Eszter Toth [eszter_toth93@hotmail.com]
Sent: 02 June 2014 17:26
To: Gareth Metcalfe
Subject: Finished dissertation

Hi Gareth,

Attached please find a copy of my finished dissertation, I hope you like it. I received my feedback today, and I got 75%, which is a 1st and I'm really pleased with it.

Just wanted to say thank you to you and the children again for everything, it's been a pleasure working with them.

Best Wishes
Eszter

From: gareth.metcalfe@bradshawhall.stockport.sch.uk
To: eszter_toth93@hotmail.com
Date: Fri, 1 Nov 2013 15:42:01 +0000
Subject: RE: dissertation

Hi Eszter,

We are still absolutely up for you coming and doing your research here. I would be happy to discuss it with you; the best times to do so for me are on a Thursday from 4pm onwards, or on Friday any time from 12:30pm onwards (I don't teach on a Friday afternoon). I tend to be in meetings or elsewhere Monday - Wednesday at the moment. If you let me know which Thursday or Friday you could do, then I will put it in the diary. I assume that it's better if we meet up, but equally if you just wanted to phone then that would be fine too.

Gareth

ps134-8-think-big-the-human-condition-project-metcalf.pdf - Adobe Reader

File Edit View Window Help

Tools Sign Comment

Protected View: This file originated from a potentially unsafe location, and most features have been disabled to avoid potential security risks.

Teacher Secondment: Gareth Metcalfe, Bradshaw Hall Primary School, Stockport - encouraging children to work like scientists by conducting real scientific investigations into the human condition'
www.ase.org.uk/.../ps134-8-think-big-the-human-condition-project-metc

THINK BIG!

Gareth Metcalfe shares how this project is bringing the big ideas of science education to life in his school

The Human Condition project

Contents
 Number 134 | Sept/Oct 2014

Primary Science
 Editor Tara Daviesley

3 Focus on
 4 Notice Based
 5 Look, think, talk: Making thinking maps 'stickier' in the classroom
 8 Think big! The Human Condition project
 13 Change the way your pupils learn by practising creative thinking and visualisation
 17 Avoiding neurological pitfalls
 18 Research into inheritance and evolution (with Dr Who's help)

Key words:
 Thinking skills
 Nature of science

What are the overarching aims of an effective science education? How can we provide the children with a genuine experience of carrying out an extended scientific investigation? And can we change the perception of what it means to be a scientist? These were the three key questions that lay behind 'The Human Condition' project, an initiative funded by the Primary Science Teaching Trust (www.pstt.org.uk) to explore a new approach to science teaching.

as a subject: to see science as an inquisitive, creative and evidence-based way of thinking rather than a body of knowledge and skills that need to be learned. I wanted to show the children that they all have the capacity to think and act scientifically. I also wanted the children in my class (ages 10-11) to have the opportunity to plan, carry out and evaluate an extended 'non-standard' scientific investigation. The Human Condition project would force the children out of their comfort zones and into a

behaviour - an extremely complex process! In this project, the children were not investigating a fixed, universal property (such as gravity and air resistance), but looking at the strength of cause-and-effect relationships, where they have to examine the validity of their data, a critically important scientific principle.

Big ideas
 This report Principles and big ideas of science education (Harlen, 2010) had a profound affect

10:59
24/02/2015



B1 Staff continue to have opportunities for CPD
 D2 There are clear links to outside agencies/ organisations/ communities to enrich science teaching and learning

How are we sharing Science with others? B1 C2 D1 D2

Miss Sullivan

http://eric.ed.gov/?id=EJ977678

ERIC - "That Was Brilliant!", ... X

ERIC

Collection Thesaurus

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Peer reviewed only Full text available on ERIC

"That Was Brilliant!"

Thompson, Penny; Fleetwood, Colin; Garnett, Rosie; Metcalfe, Gareth

Primary Science, n121 p26-29 Jan 2012

In this article, the authors report on the Top Marks project and some of the successful activities that made assessment "real." The aim of Top Marks project was to "invigorate the assessment of science with fun, relevance, real-life and engagement". The project involved collaboration between schools and primary science consultants from the Centre for Science Education at Sheffield Hallam University and Stockport local authority. The consultants provided training sessions on current assessment practice in science, the development of questioning skills and how information and communications technology (ICT) can be used to support assessment. The Centre for Science Education introduced their approach of using "rich" experiences to enhance teaching and learning in primary science. Teachers from each school worked collaboratively to plan, deliver and evaluate a range of innovative assessment activities, which were funded by a grant from the AstraZeneca Science Teaching Trust. (Contains 3 figures, 1 table, and 1 box.)

Descriptors: [Student Evaluation](#), [Consultants](#), [Training](#), [Program Effectiveness](#), [Science Education](#), [Teaching Methods](#), [Science Activities](#), [Primary Education](#), [Information Technology](#), [Teacher Educators](#)

Association for Science Education. College Lane Hatfield, Herts, AL10 9AA, UK. Tel: +44-1-707-283000; Fax: +44-1-707-266532; e-mail: info@ase.org.uk; Web site: <http://www.ase.org.uk>

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Publication Date: 2012-Jan

Pages: 4

Abstractor: ERIC

Reference Count: 2

ISBN: N/A

ISSN: ISSN-0269-2465

Gareth Metcalfe sharing his knowledge of Science teaching to others in Manchester and Sheffield:

With thanks to the teachers and schools involved:

Gareth Metcalfe, year 6 teacher, Bradshaw Hall Primary School;
Pauline Tyler, year 3/4 teacher, Grenoside Primary School;
Michelle Proctor, year 1/2 teacher, Montenevy Primary School;
Emma Hughes, Montenevy Primary School.

LET THEM GO

Figure 2: Selecting on the quality of outstanding contexts

Primary school courtesy of Bradshaw Hall Primary School, Cheadle

Reference

Goodwin, A. (2011) Wonder in science teaching and learning: An Update. *School Science Review*, 43(201), 65-73.

We thank to the teacher and school involved: Gareth Metcalfe, year 6 teacher, Bradshaw Hall Primary School; Pauline Tyler, year 3/4 teacher, Grenoside Primary School; Michelle Proctor, year 1/2 teacher, Montenevy Primary School.

Lynne Bianchi is a Principal Research Fellow in the Centre for Science Education, Sheffield Hallam University, and directs the A2STT Primary Science Research & Innovation Hub. Email: l.m.bianchi@shu.ac.uk

to find a means by which to enhance the "wondering" practice, even within a standards-driven culture.

What next?

It would be of interest to take more time to consider how this work fits with educational discourses on national level, how it links with current educational practice.

Lucy (see Website). Please share your experiences and children's wonderings, and have you looker them with us by emailing the author.

Websites

Expansive Education Network: www.expansiveeducation.net

The Marks System: www.marksystem.co.uk

16:36 25/03/2015

to wonder? Where do we find space for children to share their wonderings in school? What, if any, is the role of the teacher in a child's wondering? And what is the value of wondering in our primary science classrooms today? Lynne Bianchi shares the answers she and others have found in a recent project.

Over the summer term last year, the Centre for Science Education at Sheffield Hallam University and teachers representing three schools in Sheffield and Stockport considered how children's wonderings could be explored and potentially used as authentic starting points for curriculum design for science and, indeed, other subject areas. They worked with children aged from 6 to 11 years old and, with the help of AstraZeneca Science Teaching Trust (AZSTT) funding, held three focused meetings to explore this area further.

- Stimulated by research undertaken at the Centre for Science Education and that of others, in particular Goodwin (2001), initial discussions explored what wonder is and collected on the outcomes from other projects (see call), which taught us more about the relevance of context-rich, activity-rich and response-rich approaches to curriculum design in primary science. Informed by the prospect of encouraging wonder in their classrooms, the teachers went back to their classes to ask their children what they wondered about and to encourage this in ways that they saw fit with their year groups.
- Support and critique was given in the second meeting, which was aimed with talk about a whole host of questions that the children had shared (Box 1).
- The final session focused on summarising what had been learnt. They looked more closely at how the wondering activities had been organised, from encouraging and leading children in sharing their wonderings, through to looking for those that could be explored through scientific enquiry. With so many different types of questions we also considered our role as teachers in this process. Should we tell them the answer or encourage them to find it out?

Key words: Creativity, Children's ideas

PRIMARY SCIENCE 128 May/June 2013 19

16:36 25/03/2015

Links with outside agencies ... Cheadle Hulme School

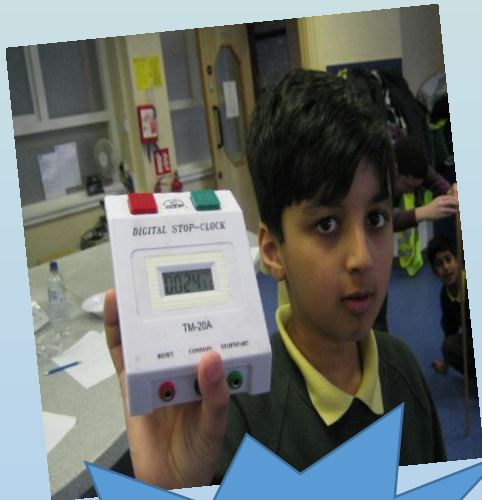
D2 A1 A4 B1 B2 C1 C3



The partnership that we have with local secondary schools has influenced the planning of science curriculum in Year 5/6. Year 6 children are already becoming more analytical in their Science investigations through Gareth Metcalfe's lessons.

The impact of visiting Cheadle Hulme gives our children opportunities to study science in a variety of environments. We know that children enjoy the lessons at Cheadle Hulme because 'fun', 'interactive', and 'enjoyable' are just a few feedback comments. Bradshaw Hall will continue to think creatively and provide experiences so that children make excellent progress

Children from Year 5 were able to take part in Science activities at our local partner secondary school. The children were able to use sophisticated science equipment, sit in a real laboratory and use meet Science Professors. Furthermore, our Y5 teacher increased his scientific knowledge by working with secondary colleagues.



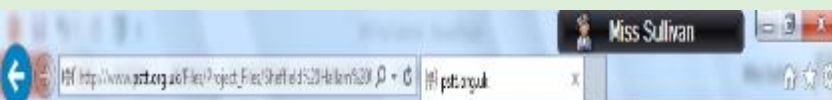
Using secondary school ICT equipment



Becoming familiar with a laboratory. Using Bunsen Burners!



Outside Agencies and Wider Community D2 B1 B2 C3



SCIENTIFIC WEAVING

A Primary Science Teaching Trust Research & Innovation Hub Project

AIMS	ACTIVITY	EVALUATION
<ul style="list-style-type: none">Through immersive experiences allowed to working like a scientistimprove pupil attainment and achievement in scienceenhance teacher's knowledge and confidence in science content knowledgemake use of their learning journeys that improve the skills and the content of their science	<ul style="list-style-type: none">Bringing people together to work in different ways...7 schools (5 primary in Sheffield & Sedgefield, 2 secondary, 5 classes from Year 3-6 pupils aged 7-10 years)Focus on the Primary Science ICT Skill Materials & their PropertiesIdentifying children's questions that are less satisfactorily answered in designWorking with specialist consultants and external developers from high quality Universities	<ul style="list-style-type: none">Using protocols and embedding to all those through talk and practical workStructured Inquest Development Meetings x 2: Identify what's gone (times and work logs), 3-day framework: Drive in-school activity led by teachers, children's experiences and special circumstances eventsDevelop a range of important immersive science projects, driven by the children's own questions and linked to the ICT Skills as explained on children working collaboratively and communicating with their peers and school externally

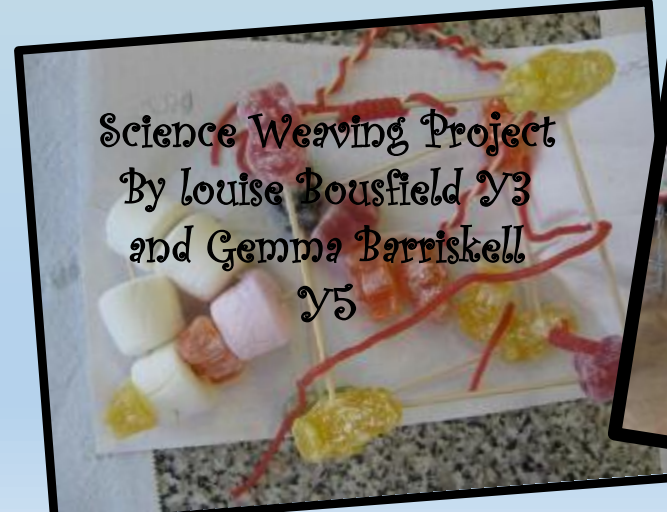
What the children asked...

- Why are we making this?
- How do you make this?
- What is this a good quality?
- make pictures to represent our ideas
- make a video to explain our work with children

Teachers from Y3 and Y5 took part in a Scientific Weaving project run through the University of Manchester PSTT Hub.

- The project helped raise the profile of Science in school
- Enthused girls to be interested in Science
- Created inks with high school colleagues and scientists
- Enriched curriculum

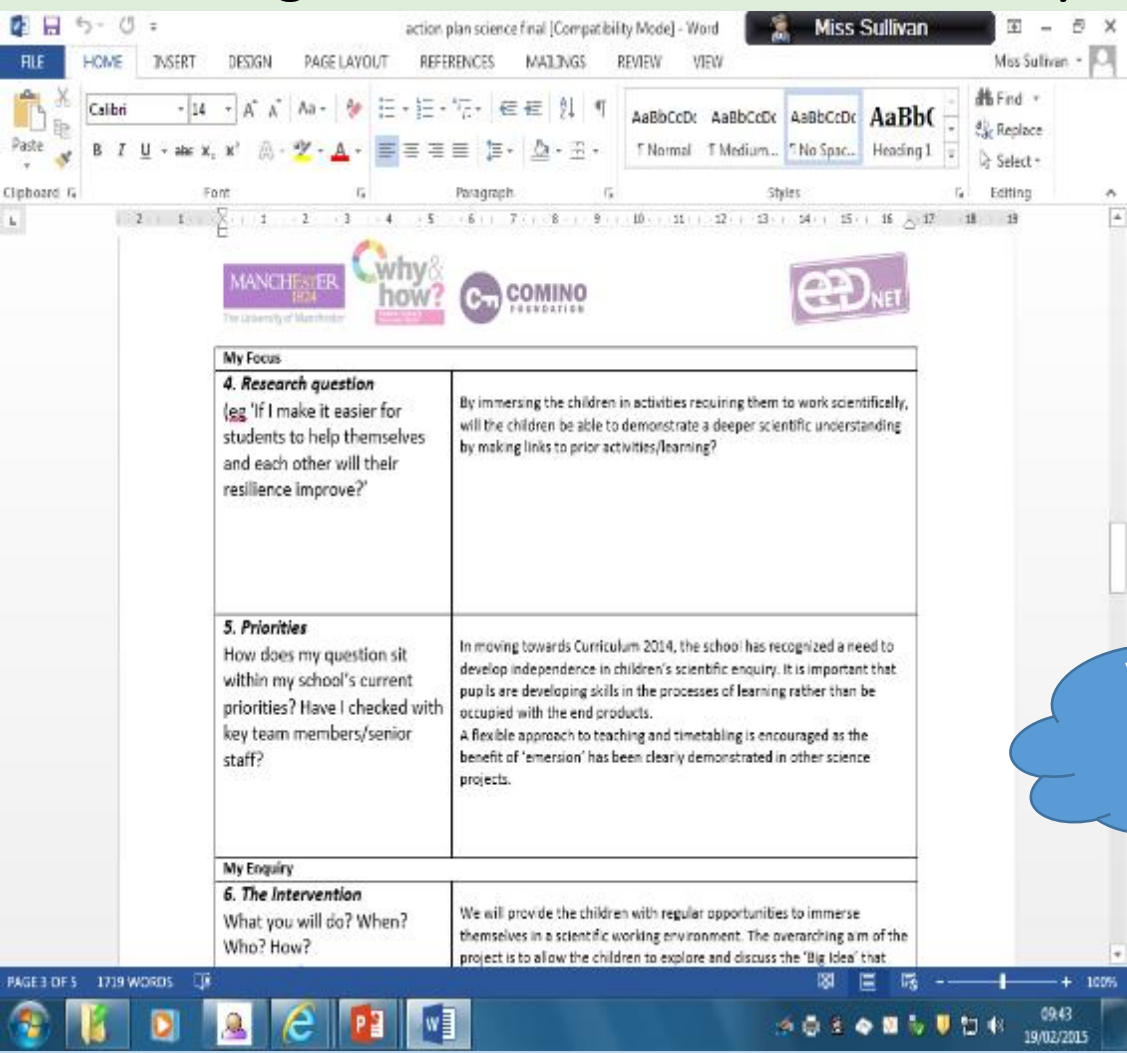
'This year has been action packed – teachers have been working with scientists from the University of Manchester to explore in many ways what it means to work scientifically. **The Scientific Weaving project and the Smart Scientists project** has shown us how we can embrace a contemporary and realistic scientific method in the work we do with children in our KS1 and KS2 classrooms. **Teachers have worked in clusters, attended structured sessions at the University and co-taught lessons in schools with scientists and High School partners.** Partnerships with creative and media charities, such as the Ideas Foundation has enabled children to communicate their science learning through animations, and creative story writing'. **PRIMARY SCIENCE TEACHING TRUST WEB SITE**



Working with Dr Leather to challenge gender stereotypes

Outside Agencies and Wider Community D2 C1

Smart Science project ... teaming up with schools from cluster area and **Manchester University** ... looking at developing how a real scientist work. **Years 3 and 4** took on board an immersive learning approach Science is being taught in creative ways Using outdoor areas Children are becoming more inquisitive ... asking questions ... Children are really enjoying their Science learning experiences



A4 Science is a valued subject
B2 Range of teaching and learning approaches
C1 Pupils are actively engaged in own learning ...

Why does he have different shaped teeth?
 What do ducks eat? What eats a duck?

Looking at animal poo to see what it eats



"Not only do staff at school take the position of science in the curriculum seriously they make it fun and challenging. There have been some great guests coming into School making Science both interesting and fun." **Rob Baker, Chair of Governors, February 2015** A3 A4 A5 B2 C3 D1

Bradshaw Hall teachers supporting other teachers

Bradshaw Hall Science teachers were asked to speak at a Science CPD in Stockport. A number of Stockport schools attended the CPD and heard our teachers talk about their respective Science projects and styles of Science teaching.



Louise Bousfield and Matt Willis



Gareth Metcalfe, Assistant Head Teacher, discussing the 'Human Condition'



THROUGH THE SCIENCE WINDOW 1
 THE FIRST OF A SERIES OF TEACHER MEETS ON PRIMARY SCIENCE

“WONDER-FULL”
 SCIENCE?

As Science teachers we endeavor to enthuse children to 'work scientifically' as the basis for their learning. What do you do to really engage children to wonder in your Science classroom? Can we do more to encourage a sense of wonder and spark curiosity? Come and share how you make Science "wonder-full!"

WHEN
 Nov 25th, 2014
 3.30pm - 6.00pm

WHERE
Great Moor Infants School
 Southwood Road, Stockport, SK4 7DG
 Just off the A6 Stockport & a skip from Woodmoor Train Station

HOSTED BY
 University of Manchester's SERIH
 (www.manchester.ac.uk/fascinate) and @StockportSLIC

- Free tea/coffee from 3.30pm
- Presentations kicked off by Prof. Danielle George from 4
- Refreshments and more for you opportunities!

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fascinate
 MANCHESTER 1824
 The University of Manchester

why how? COMING

#TMSCIWonder

All Bradshaw Hall staff attended Science CPD hosted by University of Manchester



Wider linksHow are we sharing Science with others? D2 A4 A5 B1 D1

Louise Bousfield, is currently working in Year 3, gave a Science Weaving presentation to cluster schools at Manchester/Tameside (October 2013). She shared her knowledge of the project and teachers trialled the activities at their own schools.

To the same cluster group, **Louise delivered a presentation** 'Change of State' showing how a materials topic can be delivered to children in an engaging and rich way. **Louise is now is now the LEAD TEACHER for the SK4 project (see next slide)**. The project works with primary schools to develop science capital in own school communities. **Louise leads and co-ordinates** the four other schools in the Stockport area, working closely with Lynne Bianchi (Head of the University of Manchester's Science Education Research & Innovation Hub) to research and evidence parental and industry involvement in Science learning at school.

More information on SK4 project:

<http://epsassets.manchester.ac.uk/medialand/fascinate/projects/sk4.pdf>

Science weaving at Bradshaw Hall involved **cross phase teaching between Y3 and Y5**. Teachers from across the school observed lessons. Lynne Bianchi and Joelle Halliday gave input to Twitter feeds.



SK4 project led by Louise Bousfield (PSTT 2015) D2

This project is led by Louise. She has made a huge impact on Bradshaw Hall's vision for Science learning. She is now leading and working with other Stockport teachers to share her knowledge and enthusiasm in Science.

Louise had her induction to PSTT (Bristol) March 2015



SK4: Developing Scientific Capital through the School Community

Take 4 primary schools in Stockport who are committed to exploring and developing children's skills and understanding of working scientifically and encourage them to seek out and develop the Scientific Capital in their communities. Through the 5 E's Instructional Model: **Engage, Explore, Explain, Extend (or Elaborate), and Evaluate** teachers will work alongside scientists and engineers to deconstruct what it means to be a scientist, exploring where science is in our communities, who is a scientist, what is science, why there is science and how we do science.

Note: where 'science' is used in this paper, it is extended to science and engineering.

ASPIRES Young people's science & career aspirations, age 10-14 (Kings College 2013)
Science capital refers to science-related qualifications, understanding, knowledge (about science and 'how it works'), interest and social contacts (e.g. a parent, family member or even knowing someone who works in a science-related job).

Science capital is unevenly spread across societal groups. Those with higher levels of science capital tend to be middle-class – although this is not always the case, and not all middle-class families possess much science capital.

Students from families with medium or high science capital are more likely to aspire to science and STEM-related careers and are more likely to plan to study science post-16.

The most effective way to improve teaching is to support teacher development and that is the main driver of Trust work. At primary science level our desire is to see **confidence raised in teaching science and for teachers and pupils to enjoy science exploration**. Through CPD units and other dissemination tools we are seeking to provide a platform of resources across primary science and through to KS3 to support science teaching in the UK.

Louise Bousfield was chosen by the Standards Testing Agency and the Department for Education to help with the implementation of the revised Science curriculum. A2 A4 A5 B1 **D2**

Louise's impact is now at national level, not just in our school or through Manchester University projects. She will support teachers understanding of national standards when making teacher assessment judgements.

The screenshot shows the homepage of the Standards and Testing Agency. At the top, there is a navigation bar with the GOV.UK logo, a search box, and links to Departments, Worldwide, How government works, and Get involved. Below this, the agency's name and logo are displayed. The main content area features a large heading 'About us' and several sections: 'What we do', 'Who we are', and 'Our responsibilities'. The 'What we do' section states that the agency sets tests for children from early years to key stage 2 and also develops professional skills tests for trainee teachers. The 'Who we are' section mentions that the agency is an executive agency of the Department for Education with around 100 staff. The 'Our responsibilities' section lists the agency's role in developing high-quality national curriculum tests.

Standards and Testing Agency homepage

About us

What we do

We set the tests to assess children in education from early years to the end of key stage 2.

We also develop the professional skills tests for trainee teachers and manage the Yellow Label Service for secure dispatch of traceable exam scripts.

Who we are

We're an executive agency of the [Department for Education](#), with around 100 staff based throughout the UK, in Coventry, London, Nottingham, Sheffield and Manchester.

Our responsibilities

We're responsible for:

- developing high quality national curriculum tests to meet the criteria of

This screenshot shows the 'Who we are' section of the Standards and Testing Agency website. It includes a table of contents, a description of the agency as an executive agency of the Department for Education, and a list of responsibilities. The responsibilities include developing high-quality national curriculum tests, supporting schools, managing the submission and moderation of teacher assessment, and developing professional skills tests for trainee teachers. It also lists priorities for 2014-2015, such as delivering the 2014 national curriculum test cycle and preparing for the 2015 national curriculum test cycle.

Who we are

We're an executive agency of the [Department for Education](#), with around 100 staff based throughout the UK, in Coventry, London, Nottingham, Sheffield and Manchester.

Our responsibilities

We're responsible for:

- developing high quality national curriculum tests to meet the criteria of the [Office of Qualifications and Examinations Regulation](#)
- supporting schools to carry out the testing and then managing the assessment
- managing the submission and moderation of teacher assessment
- developing the professional skills tests for trainee teachers
- managing the Yellow Label Service to make sure exam scripts reach examiners reliably

Our priorities

From 2014 to 2015, our priorities will be to:

- deliver the 2014 national curriculum test cycle
- prepare for the 2015 national curriculum test cycle
- develop tests to support the new national curriculum from 2016
- deliver the Professional Skills Tests for prospective teachers Providing the logistics service for General Qualifications

Corporate information

Access our information Jobs and contracts

- [Complaints procedure](#) - [Jobs](#)

There is an effective subject leader (A1), There is a clear vision of Science (A2), Pupil Voice (A4)

I led a Whole School Assembly to explain to children the process of PSQM. I asked the children to give me their opinions, thoughts and ideas on Science in school. I explained that their opinion mattered.



School Council and Eco Warriors contribute to the termly Science Newsletter



School Council and Eco Warriors put together 'Science Valued' boxes. They placed the boxes around the whole school to get feedback on how children enjoyed their teaching and learning in Science. Also, children were asked what they would like to see for the future in Science to make it even better than today!

Consequently, after listening to children

- We are going to make the Quiet Area more scientific by adding a range of plants and bird feeders. Children would like to add mirrors and mobiles.
- We are going to make a Playground wall look like the Solar System by asking artist from a local college to plan a mural
- We have planted more trees in the wooded area (March 2015)

Greenhouse made from plastic bottles (whole school parent donations!) in the Garden/Field Area, supported by teachers



Parents helping to plant saplings donated by the Woodland Trust



Science Club ... wider linksD2

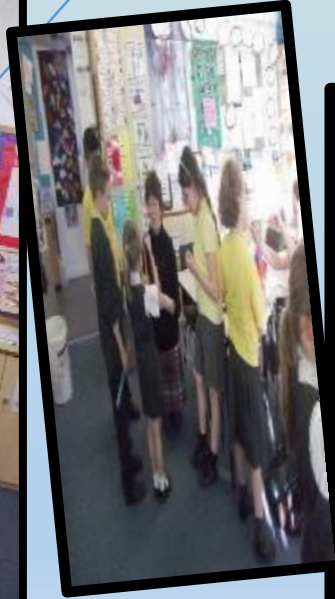
In consultation with the SLT I decided to start a Science club specifically for Free School Meal children in Y4 and Y2. We wanted the club to be across Key Stages so that Year 2 children felt supported by Year 4 children. Research has shown that a two year gap also provides the best learning environment for children to grasp new concepts.

Jaymie wishes that it was Science club every day. She looks forward to it so much!

Mrs Fullwood
Y2 parent
10th March 2015

To strengthen our local community links, we invited children from Cheadle Catholic Junior School to take part in our Science Club.

Learning about Static Electricity



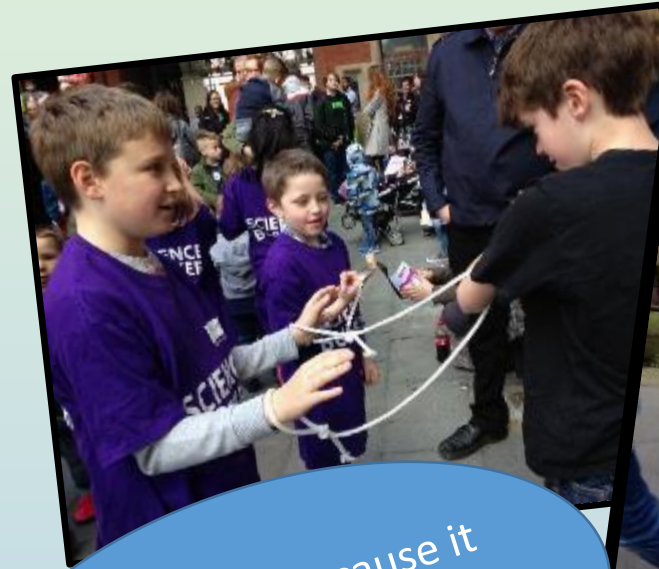
Testing our reactions!



Bradshaw Hall Science Buskers D2 A4 A5 C1 C3 D1



Children were invited to take part in training sessions at Manchester University to become Science Buskers. They performed at the Manchester Science Festival on Saturday, 21 March. Outside Manchester Museum the buskers showed a variety of Science 'tricks' to the general public. Our Science Buskers have also performed at our Science Morning.



We loved it because it was fun and easy Science!



We made lots of people laugh



Science ..in the future at Bradshaw Hall and the impact of PSQM

- This summer Matt Willis (Y3) will be working with Phil Manning, Professor of Natural History (STFC Science in Society Fellow). Matt, will be working with 3 other primary teachers and 3 secondary teachers to develop a Scheme of Work on the topic of Splitting Atoms and other biological structures.
- Louise Bousfield, Matt Willis, Sam McGill (Speech and Language Centre) and Clare Jones (Y1) are part of the SK4 team working along side Lynne Bianchi. Louise is leading four cluster primary schools in the project to develop and explore science capital in the playground. Questionnaires to parents have been collated and a pool of scientists have been logged. Not just doctors, but hairdressers, artists, and sports coaches. With the pool of science talents, the school can ask parents to come into school to share their knowledge.

[SK4 - a project with primary schools to develop science ...](#)

• [networking.stemnet.org.uk/.../sk4-project-primary-schools-develop-scienc...Cached](#)

30 Nov 2014 - **SK4** - a **project** with primary schools to develop science capital in their school communities. Date Submitted: 30 November ... **Lynne Bianchi**

- In 2016 I would like to see Bradshaw Hall share great Science teaching and learning with the global community. I have already shared my ideas with Lynne Bianchi at Manchester University. However, I have previous teaching links with South African and Australian schools, so getting started (by using Skype) should be straight forward.. (see next slide)

“The impact of PSQM has been amazing, not only for Jacqui, but for all our staff at Bradshaw Hall. There is even more drive in our teachers to provide the best, creative ‘out of the box’ teaching possible in Science.” Chris Bagnall, Headteacher



The impact of PSQM Confidence to share Science with schools overseas ...

A1 A2 A4 D1 D2

Lynne Bianchi,
Manchester
University on
board with the
idea of
Bradshaw Hall
working with a
school from
overseas.

The screenshot shows an Outlook Web App interface. The browser address bar displays <https://webmail.sseln.org.uk/owa/>. The user is logged in as Miss Sullivan. The interface includes a navigation pane on the left with folders like Calendar, Contacts, Deleted Items, Drafts, Inbox (6), Junk E-Mail, Notes, Outbox, Sent Items, Tasks, and Search Folders. The main area shows an email titled "RE: Going Global!" from Lynne Bianchi [lynne.bianchi@manchester.ac.uk] sent on 23 March 2015 at 11:38. The email content includes:

Wow – you have great ideas!!
I know of some schools having partnered in the past – but they were secondary schools.
I think the ASE network might be useful here but will think on.
Lynne

From: Jacqui Sullivan [mailto:Jacqui.Sullivan@bradshawhall.stockport.sch.uk]
Sent: 23 March 2015 11:14
To: Lynne Bianchi
Cc: Chris Bagnall
Subject: Going Global!

Hi Lynne

do you know how we could become a partner school to a school abroad where we could share Science ideas? We could Skype lessons etc ?
Jacqui

At the bottom, there is a disclaimer: "This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the system manager. Please note that any views or opinions presented in this email are solely those of the author and do not necessarily represent those of the school. Finally, the recipient should check this email and any attachments for the presence of viruses. The school accepts no liability for any damage caused by any virus transmitted by this email."

From the Assistant Head Teacher, Gareth Metcalfe, commenting on the impact of science initiatives on attainment...



‘Historically, the children at Bradshaw Hall Primary School used to leave school with a strong scientific knowledge. However, their inquiry skills were not as strong as their science knowledge. This was demonstrated by SATS test results and teacher assessment judgements up to 2010.

Since that time, the school have looked to enable the children at Bradshaw Hall to ‘think like scientists’. This is the thread that ties together all of the subsequent projects that staff have been involved in, and trials within the school. As a staff, we have been on a long journey to enrich the scientific journey of all children, culminating in this application for the PSQM Award.

Now, teacher assessment judgements show that attainment in science is consistently strong, with scientific enquiry skills being a relative strength for our children. The year 6 cohort in 2009 were assessed as having 85% of children working at level 4 or above, and 31% as level 5 or above. The current year 6 cohort are currently teacher assessed (Spring 2015) as having 100% of children working at level 4 or above and 57% level 5 or above.

We are anticipating the greatest improvements, though, to be seen in cohorts coming through the school currently, who have been involved in far more of the latest science initiatives, under the guise of the new science leadership team. It is an exciting vision, and one that has had an amazing impact within the school.’

PSQM Impact on Standards

Teacher assessment judgements for the 2014-2015 year 6 cohort show that standards in reading, writing and maths are significantly above the national average both in terms of progress and attainment.

As well as improving attainment in science, we believe the current science initiatives have contributed enormously to this increase in attainment. The school believes that by creating a rich curriculum, children will thrive – in maths, reading and writing as well as science. This is especially the case for children working towards levels 5 and 6. In maths, 70% of the children are predicted level 5, and 26% level 6. Science has contributed enormously to developing the problem-solving and reasoning skills required for these children to make such outstanding progress.

Predicted levels for 2015 based on January 2015 data

Number of pupils in Y6 cohort		Predicted number level 4+ R,W,M	Predicted number level 5+ R,W,M	Predicted number 2 Levels /3 Levels progress Reading (National 2014 94% / 35%)		Predicted number 2 Levels /3 Levels progress Writing (National 2014 96% / 34%)		Predicted number 2 Levels /3 Levels progress Maths (National 2014 93% / 36%)	
				2 levels	3 levels	2 levels	3 levels	2 levels	3 levels
PP	5	5	1	1	4	2	3	3	2
Current FSM	4	4	1	1	3	2	2	2	2
Non FSM	42	40	25	16	26	17	25	13	29

From the Head Teacher, Chris Bagnall. Reflecting on PSQM impact ...



Accolades to an amazing team!

We reflect on a journey that has had large implications for us as a school. Bradshaw Hall was determined to embrace the introduction of Curriculum 2014 positively, as a tool for changing pedagogy, rather than a simple shift in topic area coverage. We used the 'context of study' from the National Curriculum document as a means of driving what learning should like, in and beyond the classroom. This led to models being drawn up and trialled in classrooms. The findings were immediate: greater engagement from children staff and parents; greater knowledge and understanding; children behaving and responding like scientists. The model of 'Immersion- Generating Questions-Classifying Questions- Developing a Unit of Work in Response to Questions- Evaluation and Peer Review' has been rolled out across school via staff meeting, INSET and coaching and through the on-going dialogue with the University and other colleagues. The model has led to a change of pedagogy in other areas of the curriculum too. Geography and history is taught using the same guiding principles. As the process is embedding, staff are having the confidence to trial pedagogy in all areas of learning and teaching. Staff are spending an increased amount of time researching and reflecting upon their practise. There is a real buzz around school. Everything is possible. The award has provided real professional development opportunities for staff.

Jacqui Sullivan, such a credible teacher in the classroom, has proven to have real leadership qualities. She speaks so professionally and passionately about science. This has also been recognised by colleagues beyond the school who have commented how, 'Jacqui has grown in stature since the beginning of the award.'

Matt Willis, an NQT last year, has been provided with unprecedented professional development opportunities, being coached and mentored by the science team and total involvement with the University. He is now developing his own trials within the larger team.

Similarly, children from the Speech and Language Centre are being immersed into science through Sam McGill's involvement.

Our reputation as a forward thinking school is growing. Our links with the science weaving project, Human Conditioning, Smart Scientists, The University, SK4 are providing a platform not just for the professional development of our own staff, but for wielding influence on other colleagues locally and in the North West.

Since inception of the award members of staff are providing support and advice on a national level. Gareth Metcalfe, through his initial work in The Human Condition Project, is a national speaker in maths with Alan Peat. The school has visitors to observe classroom practise, often weekly.

I have been involved with the Authority in the succession planning of future leaders through the Aspiring Headteachers and Deputy Headteachers Team. My involvement was largely around learning and teaching and developing an outstanding capacity throughout school.

In March 2015, Louise Bousefield was chosen by the Standards Testing Agency and the Department For Education to help with the implementation of the revised science curriculum, through the exemplifications of materials, to support teachers understanding of national standards when making teacher assessment judgements.

Much of this has been possible by the excellent links and continued professional development provided by The University, particularly Lynne Bianchi. What we have achieved is not isolated to excellence in science, but the identification of a learning culture within school. A learning culture exemplified by our staff for our children through the School's Golden Principles.

I laugh when I look at Head Teacher's job descriptions, 'Leader of Learning and Teaching.' Well not at Bradshaw Hall. We have collective understanding of the Vision and the staff are the satellites for driving standards. They are an incredible team.