



Oakdene Primary School Approach to Teaching Science



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

Our principles for science were created using pupil voice and staff voice to create a vision to underpin our science teaching and learning. Our principles are displayed in corridors and classrooms, on the website, sent to parents in the newsletter and are referred to and used to inform planning.

Staff and pupil voice show that the science principles have had a positive effect on science teaching and learning and enjoyment of science.

'The principles give us a focus for planning, we know what we are striving for to teach outstanding science ' Year 4 teacher

Our science principles are at the forefront of science teaching and learning and are visible to the community

> The principles have given the staff a unified focus and the voice of the children has played an integral part in creating actions to improve science T&L Liz Bramley

> > 'I love

Ben Year 6

Does the size of the prises of ketcher roll The size of the The liqui Type of kitchen The absorbin experiments and practical work' Type of kitchen The abcorbing



Your challenge is to find out how much kitcher roll would be needed to clean up Jimmy's mess!

In your groups think about:

Does the size of the sheet of kitchen roll affect the amount of water absorbed? How will you test it?

Our science principles inform planning and are referred to using a coloured key matching our displays on all flipcharts.

Book scrutiny shows an increase in the amount of practical work, challenge, independent work, enquiry and progression through year groups, all of which underpin our principles.

In the future, we will continue to embed our science principles and regularly review them to ensure they match our vision.

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

The profile of science has been raised in school and our key principles have been shared with pupils, parents, visitors and governors. Science has been included regularly in staff meetings, the SL has reported termly to governors, more CPD has been provided to meet the needs of staff and there have been more opportunities for children to share in science with parents.



Parents have a much bigger involvement in science this year through science themed open morning activities which has added value to our science teaching.



'I have enjoyed

completing science

with Erin, I've learnt

something new and I

have loved seeing her

excited about science'

Year 5 parent.

Forest School/Eco club has been well received by the children. Science Governors Report: Spring 2019

Progress with actions for PSQM:

Kick start grant has been awarded - $\pounds350$ towards British cience week activities. I have planned workshops for each year roup to link to their topics.

Monitoring activities showed that there were a number of positives in classroom practise such as a variety of activities, excellent questioning, independent work and collaborative work, lots of practical work.

-Targets from monitoring include - progression of skills needs to be more evident - particularly with regards to data, more challenge for higher ability children and use of the designing board for planning investigations throughout year groups.

Termly reports have created strong links with governors, informing them of progress towards PSQM/the SDP targets. This has also allowed for termly evaluation by the SL of progress towards the targets.

Next year, we would like to create links with local business to further engage the community and in turn develop the children's science capital.

Staff have felt more confident when teaching science and staff have commented that regular staff meetings and CPD have improved their planning, teaching and assessment.

SL3: There are appropriate and active goals for developing science

Science has been on the SDP for the last two years and has been developed across school by the SL. The monitoring process has identified further targets for the improvement of science. Science targets have been developed by the SL with SLT and the whole school community are aware of and are working towards these goals for our school as a whole. The SL has reported to both SL and governors to ensure that science is being developed by the whole school community.

Monitoring has shown that having clear targets in place, which have been supported and driven by the SL and SLT, has had a positive impact on teaching and learning in science including planning, planning for progress and progression in science.



SCIENCE POLICY

| | Document History |
|-----------------------|------------------|
| CREATED: (Updated) | Spring 2019 |
| By: | L. Bestwick |

A robust science policy is in place which highlights our principles and is a clear indication of expectations for new staff.

Staff have been given clear targets for improving their science teaching from monitoring activities developed by the SL and SLT.

> Lauren has developed as a leader and has been the catalyst for change across school with the empowerment of staff who continually strive for improvement' Liz Bramley

> > 'Working closely with SLT throughout the year has strengthened my leadership of science as a subject and has given me confidence in my role and validation of my judgements ' Science Subject Leader

The SL has had support and mentoring from SLT and has had support in developing monitoring in science. Furthermore, the SL has worked with the SLT to develop science targets which have stemmed from monitoring and are specific to the needs of the staff.

2018-2019 ACADEMIC YEAR ACTION PLAN FOR SCIENCE

| OBJECTIVES/ACTIONS | SUCCESS CRITERIA | TIMESCALE | RESOURCES/COSTS/TIME | |
|--|---|------------------------------|----------------------|---------|
| To apply for and achieve the PSQM | Evaluate, strengthen and celebrate science teaching at Oakdene -Completion of PSQM portfolio, action plans and portfolio | Submission Date June 2019 | £800 fee | LBF |
| To organise and tidy the Science cupboard, ensuring there are the correct resources for each year group. Ensure that all resources are working properly and well stored. | Science cupboard to be well organised, tidy and well resourced. | Beginning of Autumn term. | None | LB |
| To raise the profile of science around school, displaying the creative and practical aspects of science across school | To have a vehicle to display outstanding science teaching. | Autumn/Spring and ongoing | None | LB to p |

Next year, we would like to further strengthen governor links and include governor's in our learning walks in the autumn term to allow them to have input into target's for the year.

SL4: There is a commitment to the professional development of subject

leadership in science

The SL joined a network meeting in order to aid professional development, share best practise and to create links with other schools in the area. The SL received support from SLT in order to develop leadership skills and to develop monitoring skills.

'CPD has had a real impact and has helped us to meet our targets from book scrutiny and observation. It has really helped us focus in on our science teaching' Year 2 teacher Science Network Meeting Feb 2019

Training Focus: How to Develop 'Greater Depth' in Science

Phil Watkins

SL CPD at network meeting on Greater Depth

Science Staff Meeting Feb 2019

How to Develop Greater Depth in Science What is Greater depth and Ideas for implementation in the classroom

SL led CPD for staff as this linked to our targets from monitoring



school.

Next year, I would like to attend a middle leader course in order to further strengthen and develop my skills as science subject leader. Furthermore, I would like to continue to work closely with SLT on the continued development of monitoring in science.

SL5: There are monitoring processes to inform the development of science teaching and learning Hi Lauren,

The SL completed school wide monitoring with SLT of science teaching and learning including pupil voice, book scrutiny and learning walks with whole school feedback and targets for improvement. This was then evaluated in a second round of book scrutiny, staff voice and pupil voice to ensure there were positive changes towards meeting the development targets.

Sorry, yes. It goes as follows:

- 9.00ish-10.30 Introduction to conceptual teaching; science models; Explaining Science assessment; word walls
- 10.30-10.45 Break
- 10.45-12.00 science models; standardisation exercise
- 12.00-1.00 Lunch
- 1.00-3.00ish Working Scientifically; progression in Designing Experiments; dual objective planning; rockets; introduction to greater depth and outstanding practice in science

CPD was put in place to support staff to meet the targets from monitoring – progression in WS skills, greater depth (challenge) and vocabulary use.

'The PD Day was fantastic and gave us everything we needed to develop our teaching towards our targets from monitoring'. Year 6 teacher

nother Evidence of regular inrestigations = phar Scientific vocabulary Graph used to record results - No full unther inrechigations using frame Challenge/differentiation igation Srame discuss work scrutiny Staff meeting 14/01/19 Initial Monitoring with SLT





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Final staff meeting to review progress. Our final staff meeting highlighted that we need to continue to develop and embed challenge for greater depth children, develop vocabulary use further and explaining science.

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

The SL arranged external CPD and led internal CPD to meet the needs identified from monitoring. The SL attends a network meeting and shares information with staff. The SL led moderation activities in staff meetings. Online CPD was carried out by all staff on Reach Out CPD. Science Staff Meeting 04.02.19 - Agenda

-PSQM assessment criteria

-Assessment Grids

-Moderation using assessment grids

-Schemes of work - Phil Watkins

-Progression frameworks – differentiation and challenge in lessons

Internal CPD was carried out looking at moderation, assessment and progression by the SL during a staff meeting to assist staff in meeting targets from moderation. ReachOut CPD

Congratulations to: Lauren Bestwick from Oakdene Primary School

Online CPD with Reach Out CPD was carried out by all staff to improve subject knowledge

External CPD was arranged by the SL to provide support for staff to improve science teaching, learning, assessment and progression. CPD provided a new model for science teaching, detailed assessment boards (as pictured) which provide a framework for progression and clear expectations for staff and pupils.



Next year, I would like to arrange CPD into developing science and outdoor learning to enable staff to use our outdoor area more effectively for teaching and learning in science. T2: There is a range of effective strategies for teaching and learning science which challenge and support the learning needs of all children

Monitoring showed that there was strength in the variety of activities being provided for children across school. Our principles highlight our values of practical, independent and challenging work.



Group work (Y6)



Problem Solving (Y4)



Generating Data (Y5)



Outdoor Learning (Y3)



Hands on Learning (Y1)



Visits linked to science topics (Y2)



Practical work (Y6)

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



Observation skills (Reception)

Lightbulb Award Award

The Lightbulb award is used throughout school to celebrate children's questions and to allow them to investigate their own questions.

'I love when we design our own experiments and create data. Going outside is my favourite part of science' Bobby Year 5

> 'I love science because we do lots of different things. I like working in groups together because you can support each other' Sahand Year 4

Vocabulary displays are used across the school for high expectations in explaining science and to raise the profile of science in classrooms





Our next steps are to develop our use of the outdoor area and implement the science/forest school curriculum as planned by the SL.

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

The science cupboard has been organised each year by the SL. Needed to create a resource list and ensure that staff had all the equipment they needed. The SL completed a staff audit and using an equipment list provided by the SL's network meeting, checked off our equipment against the new science equipment list.

A range of resources have been used throughout the school to support and enhance science teaching and learning.



<text>

Primary Science Equipment List (latest Feb 2016)



- Safety (safety glasses, disposable gloves, hair bobbles, aprons/white coats, fire blanket/extinguisher, ASE Be Safe, CLEAPSS)
- Heating (gas burner, tripod, tongs, heat resistant mat, evaporating dishes, Pyrex beakers, lighter)
- Containers & Glassware (test-tubes/racks, petri-dishes, white inspection trays, specimen bottles/lids, film canisters, large pop bottles, small pop bottles with scales drawn, large clear plastic tanks)
- Measuring length (wooden rulers (number track), clear plastic rulers (cm/mm), height measurer, trundle wheel, wind-up cloth tape measures, meter tapes)
- Measuring volume (plastic beakers/jugs (250ml), plastic measuring cylinders (20/100ml), syringes (5/10ml), plastic pipettes)
- Measuring weight (bathroom scales, digital scales (gms), analogue kitchen scales)
- Measuring temperature (spirit thermometers, digital thermometers, thermometer strips (words/symbols), giant wall thermometer, soil thermometers)
- Measuring time (clockwork timers, digital stopwatches)
- Measuring environmental conditions (rain gauge, wind vane/anemometer, thermos-hygrometer)
- Data logging (temperature, light, sound, humidity, pulse, time as apps or as full data logger)
- Magnifying (hand magnifiers, magnifying pots, microscope/slides, binocular microscope, tripod magnifier, bio viewer)
- Filtering & separating (sieves, soil sieves, colanders, filter paper, plastic funnels, pestle & mortar)
- Forces & magnets (force arrow sets, kites, fans, hair drier, balloon cars, parachutes, springs, toy cars, rockets, stomn rocket/narachutes. Hovershot har/horse-shoe magnets (recycled magnets from sneakers, etc.) nins, force

A resource list from the SL's network meeting showed what gaps there were in our resources and some resources which we didn't know existed! E.g. apps for iPads.

Our next steps are to ensure that we continue to update equipment and use staff voice to ensure equipment is up to date. E.g. staff meeting showed that electricity kits are outdated – so the SL ordered new ones.

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

Our principles underpin our school wide belief that science should be a practical, enquiry based subject. Progression has been implemented and strengthened from Y1-Y6.

'We know that we are covering all aspects of enquiry due to our CPD and training. Both the children and myself feel confident in experiments' Year 2 teacher



Year 2- What happens when we put food colouring in different liquids? 'My teaching and understanding of enquiry has completely transformed this year. The quality of our science lessons have increased and so has the children's understanding'

Year 4 teacher



Year 3 – Does the distance of the torch from the object affect the size of the shadow? I love testing to see if I'm right! Poppy





Nursery – How can I make it melt faster?

Year 1 – Does different fabric keep water hot?







Year 4 – Does the type of material affect the amount of sound absorbed?

Year 5 – Does the height the rock is dropped from affect the size of the crater? Year 6 – Does the height of the drop affect the speed of the reaction?



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

Our principles highlight our belief that science trips, events and visitors are one of the fundamental principles underpinning our science curriculum.

SCIENCE COMPETITION

CAN YOU BE A SCIENCE TEACHER FOR A DAY? CAN YOU TEACH YOUR CLASS SOMETHING? CAN YOU WOW YOUR CLASS?

Children in Key Stage I and Key Stage 2 are invited to bring a small science investigation into school to show the rest of their class. Can you bring a WOW experiment into school and teach

HOW IT WORKS

The oil separates and sits above the water because it is less dense(heavy). When you add the vinegar which is heavier than the oil it sinks down through it and makes the coloured water at th bottom turn into acid.

produced and causes bubbles which rist



Children from Year 1-Year 6 took part in our competition and bought experiments into school to show to their class and in assembly.





Year 5 met astronaut Michael Foale and learnt about his inspiring life.

'It was amazing inspired me to be I'm older!'

Erica Year 6

Children in KS2 took part in the Leader's award and designed an invention to solve a problem. An amazing 4 out of 14 winners were from Oakdene Primary! Parents all attended and were blown away by their children's work.

Aspiration Fair @ Inspire2Learn

Aspiration fairs are underpinned by the belief that we need to raise children's aspirations for what their futures could be like after they leave school. One big aim is to ensure that any activity has an underlying theme of employability skills and opening eyes to possibilities. Inspire2Learn targeted the key sectors where employment possibilities will be greatest in the next ten years: Logistics, Engineering, Digital Technology and Construction. The Y5s were immersed in two hours of intense 'workshops', broken into 20 minute sessions, led by real people from a range of roles in each sector which proved to be very effective.



Year 5 attended an aspirations far with local industry and business linked to STEM careers, which has raised aspirations.

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



Year 1 STEM Day Visit



Year 5 life centre visit

'Erica is a budding scientist. The first thing she looked at for her secondary school was their science lab!' Year 6 parent.

Year 2 STEM Day Visit



Year 6 local industry visit

'Science has become the topic of conversation in our house! Indi is desperate for a lab coat' Reception parent.



Year 3 quarry visit

IF YOU WERE AN ENGINEER WHAT WOULD YOU DO?

Dear Parents/Guardians



The competition will be challenging primary and secondary p to research engineering, interview inspiring engineers and ar "If you were an engineer – what would you do?" ...the first step Science Gadget Shop



The return of the gadget shop! Our popular gadget shop we launched last year is returning for British Science Week!

Running from Monday 11th March-Friday 15th March every day after school in the main hall.

We provide regular opportunities for parents and children to discuss science at home and take part in science activities with their children.



Year 4 EDF energy visit

Our next steps are to ensure that we continue to update equipment and use staff voice to ensure equipment is up to date. E.g. staff meeting showed that electricity kits are outdated – so the SL ordered new ones.

WO1: There are appropriate links between science and other learning

We decided as a school that we wanted to link science to other areas of learning. In KS1 we decided that the link would be between science and a text, to engage the children. In KS2, we decided that we wanted the link to be between science and our creative topics.

text.

Alexis Deacon

BEEGI



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

Year 6 took part in Children Challenging Industry which has increased aspirations in Year 6 and their attitudes towards science.

For British Science Week, an outside organisation Hands on Science was organised to create a tailored, hands on experience for each class from Reception to Year 6.



'I thought I wanted to be a doctor, but now I want to be a chemical engineer!' Kendele Year 6

The Oral Health Nurse visited the Y4 children. The children tried disclosing tablets which showed up plaque on their teeth and identified areas where extra brushing is required. The children were also reminded about how to reduce their sugar intake. This complemented the key messages in the Chanee4life leaflets sent home last week.



'I can't believe I dissected a real

heart. It was

amazing!'

Visitors enhance and enrich science lessons



Staff engaged with the CIEC and local employers to create links with industry.



Eco warriors have been set up this year and children have felt empowered to make positive changes in our school environment.





Year 5 children took part in a citizens science project using a camera trap to log animals in our school area. Their findings were shared across school.

Children were given opportunities to take part in science at home with parents. WO2: There are appropriate links with families, other schools, communities and outside organisations to enrich science learning

Parents are engaged and each term are participating in Science activities with their children at Open mornings.





Year 1 open morning

Year 2 open morning Year 3

Year 3 open morning

Year 4 open morning



Year 5/6 open morning

Reception open morning

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'I know that Teesside is a fantastic area for industry and I have seen that Oakdene are providing Ellie with all the skills she needs to possibly enter that industry one day'. Year 3 parent

> 'Tlove when mum and dad come and can see what science I'm learning about. It helps me to talk about it with them at home' Jude Year 6

'I have loved learning alongside Harley in open mornings and am so glad that subjects like science are valued at his school, not just English and Maths'. Year 2 parents WO2: There are appropriate links with families, other schools, communities and outside organisations to enrich science learning

Each Year group visits local careers and enterprise company Inspire 2 Learn and takes part in STEM activities with local companies.

'Inspire 2 Learn is my favourite ever place. I love Science.' Kai Year 1

'I love our visits to Inspire
2 Learn, I always learn
something new and I like
meeting children from
other schools'
Hannah Year 5

We had the ever fabulous Y1 pupils from Oakdene Primary today. I suggested that engineers were usually men. The reaction was immediate 'Nooooooo!, Don't be silly......' really? These Y1 children were quite genuinely gender blind to the role. I am very aware that Oakdene are a very proactive school with aspirations. They engage with employers regularly and certainly use the events here as a backbone of activity to integrate with that. Looking at the new OfSTED framework they are clearly addressing the cultural and social capital requirements already. If that is what is happening then the symptoms are what I saw today. Quote from Andrew Stogdale @ Inspire 2 Learn



'Inspire 2 Learn is such a valuable resource in our area and is integral to enriching our science curriculum, making links with employers and industry'. Liz Bramley

