Boutcher C of E Primary School Subject Stories
Science

Intent

At Boutcher, we aim to develop pupils' enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life. We aim to build on previous learning, build on experiences and develop children's knowledge through revisiting topics throughout the years. We want them to gain independence as they grow as learners and retain the knowledge acquired and use and apply it as they go through the school. We aim for our children to develop a knowledge and appreciation of the contribution made by famous scientists to our knowledge of the world, including scientists from different cultures. Through the study of scientists and inventors, pupils are faced with finding out how the world as we know it developed and the discoveries that have been made to get us to where we are today. We want our children to develop a general sense of enquiry which encourages them to question and make suggestions and that can be transferable to all aspects of their learning and wider experiences. Through our teaching of science, pupils' curiosity and sense of awe of the natural world will develop through rich experiences, trips, outdoor learning and projects. We believe that vocabulary is key to meaningful and purposeful Science teaching and starting each unit with the relevant language and vocabulary will embed their use of subject specific language and help them to progress in their ability to understand the topics being studied. We aim to give pupils regular opportunities to use the scientific terms to communicate their ideas about their science work. We value the importance of speaking and listening in all areas of the curriculum and is at the heart of learning at Boutcher.

Implementation

At Boutcher, we teach science weekly where each child is supported at the appropriate level and with challenge. We use a mixture of Kent Scheme, Twinkl and Oak Academy to support the teaching and delivery of science. The progression of skills for working scientifically are developed and play a key part of each lesson. Scientific knowledge and enquiry are developed through each year group. It is key that we maximise the opportunities to recap concepts taught, build on prior learning and retain the important information and vocabulary within each topic. Science is used within other areas of learning and opportunities to make links and connections are seized where possible. Children are able to use their science learning to help them with work in other areas of the curriculum. This is key for children to develop a sense of the importance science plays in our daily lives and the world around us. It is important that we give children the opportunity to test their predictions and hypothesis and explore these through investigations and group discussion. We give opportunities to speak and listen using the knowledge gained, with particular focus on using subject specific language and vocabulary. Questioning and assessment opportunities are key in assessing children's understanding of the topic being taught. Our curriculum is mapped out across the year groups and we aim to teach specific topics according to opportunities for cross curricular links and maximising the use of resources, equipment and availability of the space given to us. The garden is used for planting topics and for whole school projects, where science learning is connected to. Children are taught with language, vocabulary, scientific enquiry and building on concepts and knowledge is at the heart of science teaching, as well as addressing key misconceptions on the way.
Our teachers aim to deliver the curriculum through recorded work, snapshots of learning and written work, including outdoor exploring, discussion, partner and group work, education visits as well as workshops. We use photos to gather evidence of moments of learning that are captured and show investigations, practical work, observations and learning outside of the classroom.

Impact

At Boutcher, progress is evident when children know more, can remember more and can use the knowledge and vocabulary taught to explain more than they could previously. Questioning throughout the topic being taught is key and gives teachers the opportunity to develop questioning further, address misconceptions or build on opportunities to assess children. Children will speak using scientific language and vocabulary and articulate and explain their ideas with greater development. Whole school engagement as well as parental involvement will be improved through homework projects and work/topics completed where the outcomes are shared with parents. Children will be excited by their learning and develop an enquiring mind where they build on the skills and knowledge acquired year on year. We assess children's knowledge of the key objectives for each unit and use Southwark STAR to track their progress throughout

each year group, in relation to each topic studied. Teachers use the emerging, developing, secure and deepened understanding performance indicators to give a judgement for each child.
We maintain a high standard of science attainment for children at the end of their key stages (Early Learning Goal-Understanding of the world and physical development)

2018-19 Science outcomes:
EYFS 83% GLD Understanding of the world
7% Exceeding GLD Understanding of the world
KS1 79 % expected standard
KS2 97% expected standard

The Science budget and resources are audited yearly and teachers will request equipment that will enhance topics when taught next time.
Children will have participated in a wide range of science events and worked to contribute to a whole school awareness of science through family learning projects and competitions, science trips and workshops. In Year One, during 'Animals including humans' unit children take part in an incubation project (eggs from Surrey Docks farm) where they observe and carefully watch the journey of the eggs until they hatch. We have loved doing this project for 8 years at Boutcher with huge success and lots of chicks hatching. In Early years, children find out about minibeasts and will take part in caterpillar to butterfly hating projects and we have also used stick insects too.
Studying science enables and encourages our pupils to ask questions about the world around them and encourage them to develop a greater curiosity in the natural world.

What can I expect to see in a Science lesson at Boutcher?

Children learning about Science in a whole class context where all children are engaged and where all children have access to the learning. Inclusion may be supported through word banks, pictures and visual aids to enhance the learning experience of children with additional needs. We regularly have visits and trips to enhance learning beyond the classroom and immersing children into the scientific world around them. Children handle resources, make links to maths learning through graphs and tables and participate in class discussions where they discuss and share ideas and scientific thinking. We encourage the use of science vocabulary in oral and written work. Photos will be taken as a snap shot opportunity to capture learning in and outside of the classroom.

Examples of our learning

Topic: Use of everyday materials

In this topic we became scientists!

We found out how to make a fabric waterproof.

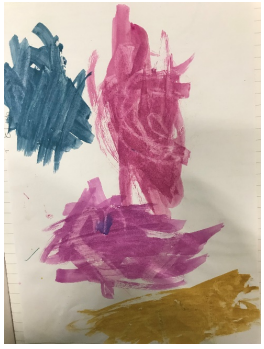
We used wax drawing to show the waterproof properties of wax.

We learnt about what happens when a material is heated and why it changes shape.

Dear Mrs Verhoeven,

Today we tested out some wax. We cut the wax into small pieces. We put the wax in the microwave to heat it up. When it came out of the microwave it melted and wasn't a solid anymore. It was now a liquid. The shape had changed. Once the wax cooled it went hard again and was a solid.

Love Annelle.

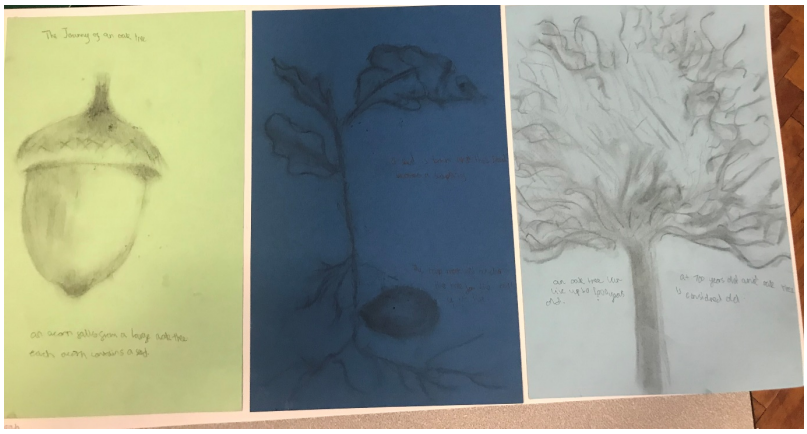


What voice do pupils have?

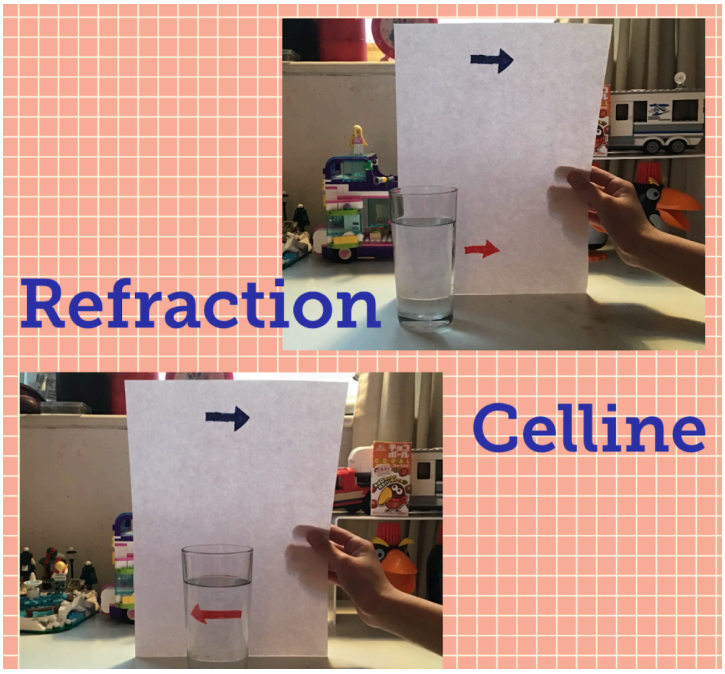
Quantum Theatre production of ‘Journey to the bottom of the garden’

Louie: ‘I was chosen to be the bee in the Science play. I had to act like a bee by travelling to the flower to get nectar. I like Science that makes you feel like you’re outside in the garden with plants and flowers.’

Noah- poster competition entry
‘I chose to draw the journey of an acorn tree because it has a very long life. An acorn eventually turns into an oak tree and some oak trees can live over 190 years. It is also really interesting because an acorn begins as a tiny seed and it grows into such a huge tree.’



Celline, Year 6 comments based on the Science teaching during home learning 2021
‘I did an experiment based on reflection. I did this experiment by finding transparent, translucent and opaque objects to reflect in the light. When it’s a dark shadow, it is an opaque object and when it’s an invisible shadow, it is translucent. When I did this experiment, I found it very interesting and I had fun because I got to learn about the different types of reflections.’


Refraction
Celline

How do children's skills progress?

An example of skills progression from Year 1 – 6

Working Scientifically- asking and answering questions						
Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore the natural world around them, making observations and drawing pictures of animals and plants.	• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement	• describe the simple functions of the basic parts of the digestive system in humans; • identify the different types of teeth in humans and their simple functions; • construct and interpret a variety of food chains, identifying producers, predators and prey.	• describe the changes as humans develop to old age.	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; • recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function; • describe the ways in which nutrients and water are transported within animals, including humans.

What examples are there of cross-curricular learning?

Making links:

Children use and apply aspects of learning from Science in a range of subjects and areas of learning. Working scientifically aspect of science links to Maths (data handling, statistics, measurement, percentages, fractions, decimals and calculating) In English, writing reports and arguments where questioning is key. In PE, thinking about how the body works and changes in the body during exercise. In PSHE, thinking about safety and keeping ourselves safe.

DT: During the design process and thinking about using a range of materials, children would use and apply their knowledge of properties of materials that is covered in Year 1, 2 and 5.

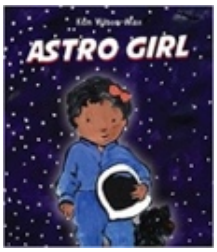
Art: Observational drawings of plants. Children use their knowledge of plants from Year 1, 2 and 3.

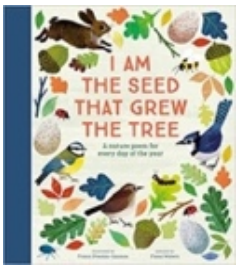
Music: Recall sounds using body parts and senses-link to Animals including human's topic which is covered Years 1-6.

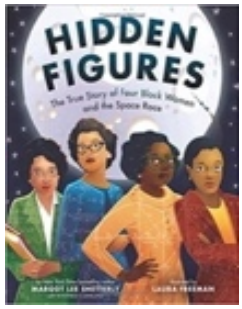
PE and PSHE- fitness, use of muscles, heart rate and pulse and how this is affected by exercise and diet.

Meaningful contexts:

This is when one subject provides a context for developing learning in another subject. In English (writing and reading), this is useful as it helps engage our children and motivates their learning where they can make links between different areas of learning in a meaningful way.







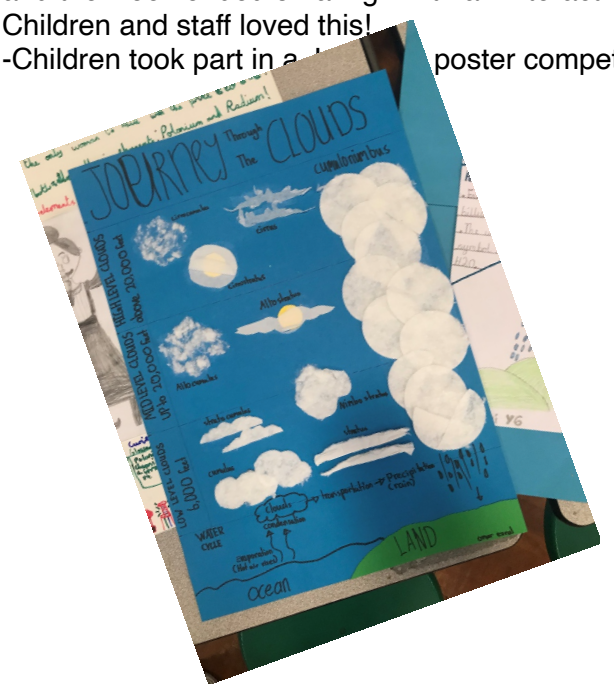
Examples of some texts used across the school:.

What successes have there been in the last few academic years?

Children worked with Liz, in the Reception garden to plant and an after school club was held to encourage planting across the school.

2018 Science Week was based on Exploration and discovery. We were visited by the Science Boffins where all children took part in a workshop delivered by scientists! Reception and Year 3 visited the Science Museum, Year 2, Year 5 and 6 visited the Cutty Sark and maritime Museum, Year 4 went to Deptford Creek and Year 1 took a trip to the Lookout Centre in Hyde Park. We had a week of fun-filled activities.

2019 Science Week was based on Journeys. We had an exciting workshop delivered by Mother Nature Scientists and lots of trips during the week to the Science Museum, Reception visited Crystal Palace Farm and the week ended on a high with an interactive play, 'Journey to the bottom of the garden'.
Children and staff loved this!
-Children took part in a poster competition



- Children make good progress in Science and build on prior learning from studying topics in previous year groups.
-Scientific enquiry is at the heart of learning where sentence starters are used to encourage children to articulate their new learning.

‘I used to think this ..... and now I think this ..... because .....’

‘I used to think this ..... and I’m now sure it’s right ..... because .....’

What are the priorities in Science for 2021/2022?

- To build more opportunities into Science teaching to use outdoor space (Peace Garden and Reception Garden) as well as trips and workshops to support the topics being covered in Science.

- To continue to develop the use cross curricular texts, with strong links to English and high-quality texts with Science links.

- To modify the unit cover sheets to incorporate questions from previous year group learning as well as ensuring the key vocabulary is given at the start of the unit and addressing misconceptions is embedded into Science teaching across the school.