

# SCIENCE AT ELEANOR PALMER

## EARLY YEARS

### SCIENCE TEACHING AND LEARNING AT ELEANOR PALMER

Science is taught weekly, either in the classroom or in our award-winning Lab. Every year group has one science-led topic per year (below, in pink font) which frames the learning for that term. This science topic has an 'EP Collectable' which contains key vocabulary and ideas within it. In other terms, science content is taught discreetly. In addition, each year group, from Nursery to Year 6, has a block of 4 weeks per year where science is taught in small groups of ten or fewer by the science lead. These sessions are linked to their science topic and allow the children to deepen their understanding of key concepts while also performing a broader range of exciting experiments.

Across the juniors, children who will benefit from additional oracy input are given the opportunity to further develop their speaking and listening skills in 'vertical groups'. Through 'STEAM Stars', children in Years 1 and 2 have an opportunity to work with our DT lead in small groups to encourage them to talk about their ideas while engaging in fun practical activities. These tailor-made sessions follow the children's interests and questions while also encouraging a love of science.

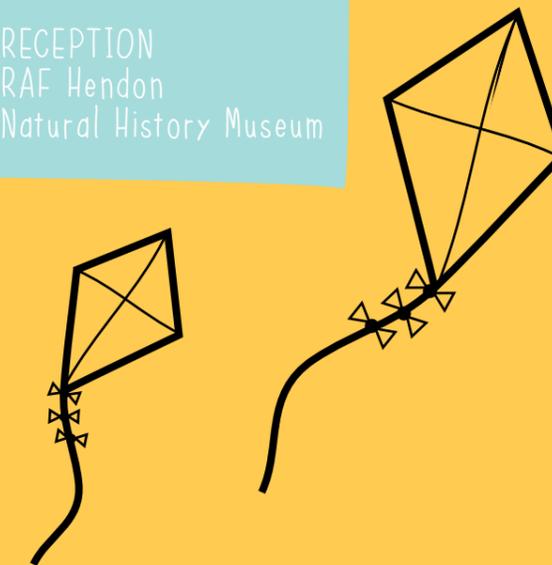
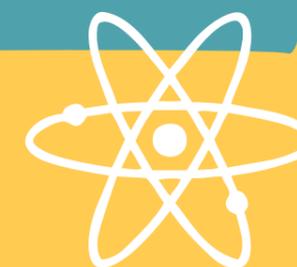
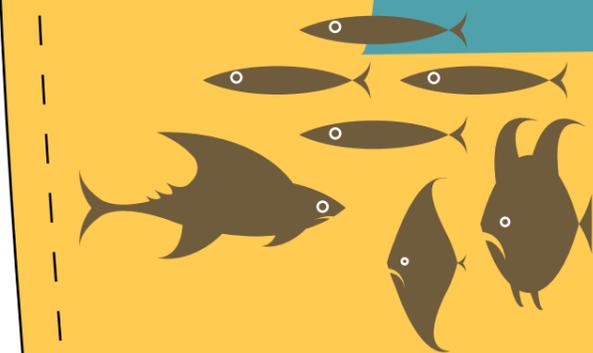
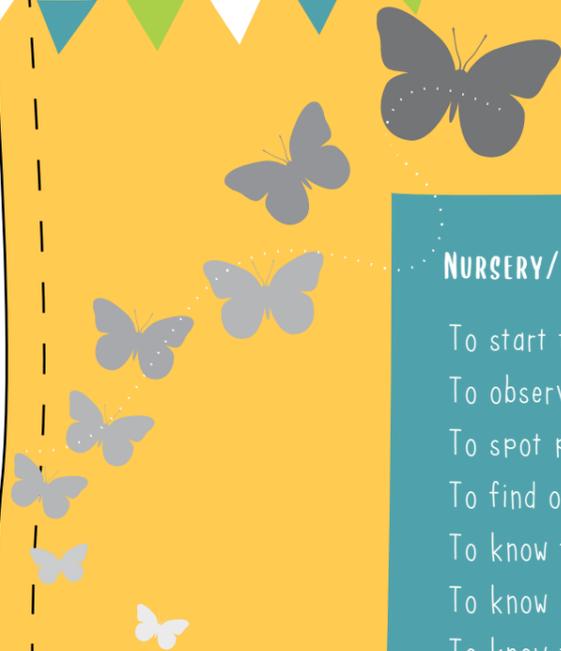
We have a number of important links with outside organisations, including the Wellcome Trust, Oæden Trust and the Crick Institute, who, as well as working alongside our children, deliver CPD to staff. As well as numerous trips to bring science topics alive, we also welcome specialists into school to deliver talks and workshops to classes to give the children a sense of the work of scientists in everyday life.

### NURSERY/RECEPTION KEY LEARNING

- To start to understand cause and effect and that some actions have the same consequence when performed repeatedly
- To observe and talk about change over time
- To spot patterns
- To find out about the world around us
- To know that plants can grow from seeds and what plants need to grow well
- To know how to take care of ourselves and what to do to keep our bodies healthy
- To know that different materials have different properties.
- To know that objects float or sink and to make predictions about which objects will float and which will sink
- To know about similarities and differences in relation to places, objects, materials and living things.
- Be able to talk about the features of their own immediate environment and how environments might vary from one another.
- Make observations of animals and plants and explain why some things occur, and talk about changes.

### ENRICHMENT

- NURSERY  
Camley Street Nature Reserve  
Heath walk
- RECEPTION  
RAF Hendon  
Natural History Museum



# SCIENCE AT ELEANOR PALMER

## KEY STAGE 1

### ENRICHMENT

Ducklings in class!  
London Zoo  
Heath Walks  
Pet visits  
Baby visits

#### YEAR 1 KEY LEARNING

##### SEASONAL CHANGE

Be able to name the four seasons  
Be able to describe weather

##### PLANTS

Basic parts of a plant  
Be able to name some plants both in our school grounds and the local area.  
Be able to name some British trees  
Know the difference between evergreen and deciduous trees, and know about British woods and forests.

##### EVERYDAY MATERIALS

Be able to identify, name, describe and group a variety of everyday materials  
Distinguish between an object and the material from which it is made  
Be able to compare and group together a variety of everyday materials on the basis of simple physical properties

##### LIGHT

Understand what light is and where it comes from  
Observe and name a variety of sources of light, including electric lights, flames and the Sun.  
Recognise that shadows are formed when a light source being blocked by something and find patterns that determine the size of shadows  
Notice that light is reflected from surfaces

##### ANIMALS, INCLUDING HUMANS

Know that there are living things called animals and that we (humans) are animals  
Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates, and be able to describe similarities and differences between them  
Identify and name a variety of common animals that are carnivores, herbivores and omnivores  
Be able to identify and name the basic parts of the human body and say which part is associated with each sense  
Have an early understanding of skeletons and how they differ  
Notice that animals, including humans, have offspring which grows into adults  
Describe the importance for humans of exercise, eating the right amounts of different food, and hygiene

### ENRICHMENT

Sculptor workshop

### ENRICHMENT

Residential at the Mill  
in Surrey

#### YEAR 2 KEY LEARNING

##### EVERYDAY MATERIALS

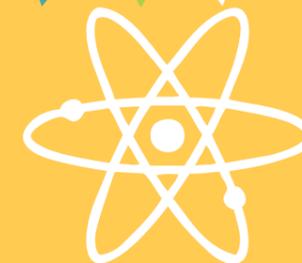
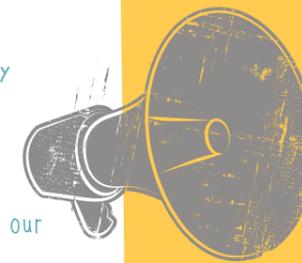
Be able to identify and compare the uses of a variety of everyday materials  
Be able to compare how things move on different surfaces  
Be able to hypothesise about and test the properties of various materials by carrying out experiments

##### SOUND

Observe and name a variety of sources of sound, noticing that we hear with our ears and have a basic understanding of the ear  
Identify how sounds are made, associating some of them with something vibrating  
Recognise that sounds get fainter as the distance from the sound source increases  
Find patterns between the pitch of a sound and features of the object that produced it  
Find patterns between the volume of a sound and the strength of the vibrations that produced it

##### LIVING THINGS AND HABITATS: BUTTERFLIES AND MINI-BEASTS

Explore and compare the difference between things that are living, dead and things that have never been alive  
Find out about and describe the basic needs of animals, including humans, for survival (water, food, air)  
Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other  
Identify and name a variety of plants and animals in their habitats, including microhabitats  
Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain. Identify and name different food sources



# SCIENCE AT ELEANOR PALMER

## KEY STAGE 2



### YEAR 3 KEY LEARNING

#### MAGNETS

Notice that some forces need contact between two objects, but magnetic forces can act at a distance

Observe how magnets attract or repel each other and attract some materials and not others

Compare and group together a variety of everyday materials based on whether they are attracted to a magnet, identify some magnetic materials (iron, nickel, cobalt and alloys including steel that contain magnetic metals).

Describe magnets as having two poles and predict whether two magnets will attract each other, depending on which poles are facing

Know that Earth is a giant bar magnet.

Know that magnets have 'real world' uses e.g. fridge doors, and electromagnets are useful and can be found in school

#### ROCKS

Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties

Describe in simple terms how fossils are formed when things that have lived are trapped within rock and that fossilisation is a long process

Recognise that soils are made from rocks and organic matter

Know that the Earth has a molten core and a solid crust

#### PLANTS

Know and understand conditions plants need in order to germinate, grow and flourish.

Name correctly all parts of a plant and be able to label them.

Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant

Observe and describe how seeds and bulbs grow into mature plants

Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves, flowers

Explore the part that flowers play in the life cycle of a flowering plant - pollination, seed formation, seed dispersal

Investigate the way in which water is transported within plants

### ENRICHMENT

The Year 3 gardening project working alongside the school gardener

Session at Hampstead Heath Education Centre

Kew Gardens

Skip Garden

### YEAR 4 KEY LEARNING

#### STATES OF MATTER

Compare and group materials together according to whether they are solids, liquids or gases

Observe that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius

Understand how changes in water temperature cause evaporation and condensation (Y5 study the water cycle in depth but this should be touched upon here).

Reversible changes mean that a material can change state from a gas into a liquid into a solid and back.

Irreversible changes cannot be reversed. New materials are made and the former materials cannot be regained including changes associated with burning and the action of acid on bicarbonate of soda.

#### LIGHT

Understand light appears to travel in straight lines

Know that objects are seen because they give out or reflect light into the eye

Be able to explain why shadows have the same shapes as the objects that cast them, to predict the size of shadows when the position of the light source changes

#### ELECTRICITY

Identify common appliances that run on electricity

Construct a simple series circuit, identify and name its basic parts □ cells, wires, bulbs, switches, buzzers

Identify whether a lamp will light in a simple series circuit and associate this with whether there is a complete loop with battery

Recognise that a switch opens and closes a circuit and associate this with whether a bulb lights up in a simple circuit

Recognise some common conductors and insulators and associate metals with being good conductors

Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit

Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches

Use recognised symbols when representing a simple circuit in a diagram

#### LIVING THINGS AND HABITATS - CLASSIFICATION

Recognise that environment can change and that this can pose dangers to living things

Identify and name a variety of living things (plants and animals) in the local and wider environment using classification key to assign them groups -

Use camping trip to identify plants, trees, insects and other wildlife

#### Animals

Construct and interpret a variety of food chains identifying producers, predators and prey - what are food chains in the local area

### ENRICHMENT

STEAM project

### ENRICHMENT

Camping trip  
Hampstead Heath Education Centre

### ENRICHMENT

Golders Hill Park Zoo



# SCIENCE AT ELEANOR PALMER

## KEY STAGE 2

### YEAR 5 KEY LEARNING

#### EARTH AND SPACE

- Describe the movement of the Earth and other planets, relative to the Sun in the solar system
- Describe the movement of the Moon relative to the Earth
- Describe the Sun, Earth and Moon as approximately spherical bodies
- Use the idea of the Earth's rotation to explain day and night

#### PROPERTIES AND CHANGES OF MATERIALS

- Compare and group together everyday materials based on evidence from comparative and fair test -hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- Understand that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including filtering, sieving, evaporating
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials
- Revisit from Y4 reversible and irreversible changes: dissolving, mixing and changes of state are reversible changes; some changes result in the formation of new material and this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

#### LIVING THINGS AND HABITATS

- Revise main points from Y1, Y2 and Y4 study of animals, including humans and living things
- Explain the difference in the life cycles of a mammal, amphibian, insect and a bird
- Describe the life process of reproduction in some plants and animals

#### ANIMALS, INCLUDING HUMANS

- Describe the changes as humans develop from birth to old age
- Describe the ways in which nutrients and water are transported within animals, including humans
- Identify and name the main parts of the human circulatory system and explain function of the heart, blood vessels and blood
- 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
- Learn about human sexual reproduction and changes in puberty.
- Understand that reproduction is another system in the body.



### ENRICHMENT

Stargazing at Sayers Croft Field Centre



### ENRICHMENT

Wick Court  
- farm residential  
Royal Vet College



### ENRICHMENT

Visit RAF Hendon

### YEAR 6 KEY LEARNING

#### FORCES

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

#### ANIMALS, INCLUDING HUMANS

- Recognise the impact of diet, exercise, drugs and lifestyle on the way their body function
- Understand the importance of sleep and its impact on mental health.

#### LIVING THINGS AND HABITATS

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and difference, including micro-organisms, plants and animals
- Give reasons for classifying plants and animals based on specific characteristics

#### EVOLUTION AND INHERITANCE

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution



### ENRICHMENT

Wormeries  
Natural History Museum



### INTENDED OUTCOME BY THE END OF YEAR 6

Children will leave EP as keen scientists with both the knowledge to explain some of the scientific world but also a strong sense of curiosity and wonder about it. Our young scientists will feel empowered because they have the tools with which they can plan, carry out and evaluate scientific experiments. They will be as comfortable with using hands-on experimentation as they are with carrying out secondary research to arrive at answers to questions about science, and will be able to make good choices about what type of investigation to carry out in order to pursue a line of enquiry. They will also be aware of some of the ethical problems that scientific discoveries and change bring about.

