



Dog Kennel Hill Primary School
East Dulwich
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SE22 8AB



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Dear parents and Carers,

Please find attached Science objectives for each year group. These objectives are set out by the government. These objectives are what your child should be learning in science. There are suggested questions, discussions and some activities written in blue for you to conduct with your child.

These objectives are split into year groups. However, feel free to take this time to ensure that your children are secure in the previous years' objectives as well. For example, if your child is in year 2, please ensure they are secure in year 1 objectives.

I hope this helps, but if you have any other suggestions please email the school and we will do our best to share ideas with other parents.

Yours sincerely,

Ms Reid
Science and Physical Education Lead





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Working scientifically

During **Years 1 and 2**, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking simple questions and recognising 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.

During **Years 3 and 4**, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking relevant questions and using different types of scientific enquiries to answer them.
- Setting up simple practical enquiries, comparative and fair tests.
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Identifying differences, similarities or changes related to simple scientific ideas and processes.
- Using straightforward scientific evidence to answer questions or to support their findings.

During **Years 5 and 6**, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Using test results to make predictions to set up further comparative and fair tests.
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Identifying scientific evidence that has been used to support or refute ideas or arguments.





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Year 1

Plants

Pupils should be taught to:

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants, including trees.

You could identify any plants that you have in your garden or that you can see from your accommodation. You could also identify and draw a range of flowers, plants, trees and seeds. You could look at the structure of flowers and trees and discuss what they need to survive and how they get it. You could draw or label flowers, plants, trees or seeds.

Animals, including humans

Pupils should be taught to:

- 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.

You could identify and name a range of animals and sort them into the different categories. You could draw animals and/or sort pictures of these. You could use a dictionary to find the meanings of carnivores, herbivores and omnivores and then group a range of animals into the specific categories relating to the food they eat. You could look at the different animals and think about the similarities and differences between them: for example do all mammals have 4 legs? Do they all give birth to live babies? You could look at the human body and label the basic parts. For example: head, legs, arms etc.

Everyday materials

Pupils should be taught to:

- Distinguish between an object and the material from which it is made.
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the 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.

You could look at a range of objects in the house and discuss what they are made from. Are they made from one or more materials? Why are they made from that particular material? You could compare two of the same thing and compare the materials from which they have been made. You could also consider why they might have been made from different materials. You could draw materials and label their properties. You could discuss the different properties of wood. For example, is it soft or hard? Is it flexible? You could draw and label the properties.





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Seasonal changes

Pupils should be taught to:

- Observe changes across the four seasons.
- Observe and describe weather associated with the seasons and how day length varies.

You can discuss the four seasons. What do they look like? What weather is associated with each specific season? You could draw the different seasons and the weathers associated with them. You could observe the weather over a few days and discuss any patterns. You could make a chart showing the weather each day for a week or a month.

Year 2

Living things and their habitats

Pupils should be taught to:

- Explore and compare the differences between things that are living, dead, and things that have never been alive.
- 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, and identify and name different sources of food.

You can collect a range of things or use images to identify which things are living, which things are dead and which things have never been alive. You can discuss/draw or sort these and see if any of these could go into more than one category. You could look in your garden or discuss any habitats that are in your local area. You could think about different habitats in the world. You could then think about the micro habitats (habitats within habitats). You could draw or label the habitats and things within the habitats. When looking at a habitat, you could identify the different animals which live there and discuss why they are suited to that specific habitat. You could identify what a food chain is and then you could create food chains linked to a range of animals.

Plants

Pupils should be taught to:

- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

You could plant a bulb and watch it grow, writing about the process and any changes that you see each week. You could discuss or draw the process of a plant growing and discuss what a plant needs to grow. You could link this to humans and animals and discuss the similarities and differences. You could plant a variety of seeds and compare how they grow. You could draw a variety of seeds and label them.

Animals, including humans

Pupils should be taught to:

- 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).





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- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

You could look and research a range of animals and look at their offspring. What do they look like when they are born? How do they adapt and change when growing? Do they change from birth to adult? You could draw or match animals and offspring. You could think about what humans and animals need to stay healthy and what they need to survive. You could draw a human and the things which we need. You could think about what humans need to survive. Think about why it is important that we eat certain foods and why we do not eat too much of other foods. You could think about and discuss the importance of exercise and how it helps people physically and mentally. You could create a poster.

Uses of everyday materials

Pupils should be taught to:

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

You could identify a range of materials within your house. You could then compare two different materials and discuss why they are different and think about their uses. You could compare two of the same objects with different materials and think about why they are different. You could identify if different materials are adaptable. Do they twist? Do they stretch? Do they bend? Can you squash them? You could draw posters about the different materials. You could write fact files.

Year 3

Plants

Pupils should be taught to:

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- Investigate the way in which water is transported within plants.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

You could pick a plant and look at the roots, stem, leaves and flowers. You could research a plant. You could also draw and label a plant. You could identify a range of plants and identify the differences in the following: air, light, water, nutrients from soil, and room to grow. Which plants don't need regular watering? Which needs regular watering? Which plants die from too much sunlight? Which do not die? You could look at how water is transported through the plant. Where does it start? Where does it travel? You could cut open a plant and look at the passages. You could write a description answering the previous questions. You could identify the meanings of pollination, seed formation and seed dispersal and then look into the life cycle of plants. You could write definitions.

Animals, including humans

Pupils should be taught to:





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- 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.

You could look into the different things that humans and animals eat. Think about what nutrients humans and animals get from different foods. Can we get the same nutrient from different things? You could create a poster/description. You could look at the human body and look at the different muscles which are within the human body. You can think about what the skeleton and muscles do for the body. You could draw a human and label the bones and muscles and specially identify their uses. You could research animal skeletons and compare these to human skeletons.

Rocks

Pupils should be taught to:

- 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.
- Recognise that soils are made from rocks and organic matter.

You could go into the outside/garden and pick some rocks. You could identify the rocks which you have found. You could research the types of rocks which are within the world and identify the different properties. You could identify what a fossil is and how they are formed. You could draw the process or write a description. You could identify and research a range of soils and think about how they are formed.

Light

Pupils should be taught to:

- Recognise that they need light in order to see things and that dark is the absence of light.
- Notice that light is reflected from surfaces.
- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
- Recognise that shadows are formed when the light from a light source is blocked by an opaque object.
- Find patterns in the way that the size of shadows change.

You could identify and investigate which things you can see with the light on or off. You could create a poster to explain why light is important. You could think about how light reflects off the surface of objects. Do they reflect better on different surfaces? Which are better? Which are worse? Why? How do you know? You could write a report answering the previous questions. You could think about what might happen if you look at the sun for too long. You could create shadows in your house or garden. What are shadows? How are they created? You could draw the process of how shadows are created. You could identify the meaning of opaque and identify opaque objects. You could investigate how you change the size of a shadow.

Forces and magnets

Pupils should be taught to:

- Compare how things move on different surfaces.





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- 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 on the basis of whether they are attracted to a magnet, and identify some magnetic materials.
- Describe magnets as having two poles.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

You could identify what gravity is and write a definition. You could create a ramp and see how different things travel down it. You could see if different surfaces change how the objects travel down the ramp. You could write up your investigation. If you have magnets at home, you could see how they pick up certain objects and not others. Why does this happen? You could write up the investigation. You could use the magnets to identify which materials are attracted and which are not. You could identify and research the two poles on a magnet and what the differences are. You could write a description about your findings.

Year 4

Living things and their habitats

Pupils should be taught to:

- Recognise that living things can be grouped in a variety of ways.
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- Recognise that environments can change and that this can sometimes pose dangers to living things.

You could identify the meanings and write a definition of the following words: movement, reproduction, sensitivity, nutrition, excretion, respiration and growth. You could create a poster or poem to help you remember the key words. You could then sort living things into categories. You could identify things from the local area and use the key words to help classify them. You could identify how the environment may change and how it could affect the living things. You could draw the two different environments and write a comparison.

Animals, including humans

Pupils should be taught to:

- 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.

You could identify what the digestive system is and write a definition. You could draw the digestive system and label it. You could then write explanations of the simple functions of the digestive system. You could identify and research the different types of teeth. You could draw the different teeth and explain what they are used for. You could identify the meaning of producers, predators and prey. Then draw a food chain and identify the producers, predators and prey within the food chain.

States of matter

Pupils should be taught to:





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- 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 (°C).
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

You could identify what solids, liquids and gases are and write a definition for each. You could then compare the similarities and differences of solids, liquids and gases. You could create a poster or a fact file about the different states. You could explore and experiment how different materials change states of matter. What happens if you heat a liquid? How happens if you cool a liquid? Can you make a gas a liquid? You could write up your investigation. You could identify the meaning of evaporation and condensation and write a definition. Does it change with the temperature? You could then see what evaporates and how you create condensation.

Sound

Pupils should be taught to:

- Identify how sounds are made, associating some of them with something vibrating.
- Recognise that vibrations from sounds travel through a medium to the ear.
- 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.
- Recognise that sounds get fainter as the distance from the sound source increases.

You could identify the meaning of sound and vibration and write a definition. You could make a range of sounds and identify the similarities and differences. You could write up what you find out. You could draw a diagram about how sound is created and the links to vibration. You could create a poster about how vibrations travel to the ear. You could investigate patterns linked to pitch and volume of sound.

Electricity

Pupils should be taught to:

- Identify common appliances that run on electricity.
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
- Recognise some common conductors and insulators, and associate metals with being good conductors.

You could identify the meaning of electricity and write a definition. You could then identify which appliances used electricity in your house. You could create a list. Do some appliances use more electricity than others? You could research circuits. Then draw and label the different components: cells, wires, bulbs, switches and buzzers. You could think about what might make a light brighter or duller within a circuit. You could think about what switches do to ensure a light turns on and off.

Year 5

Living things and their habitats





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Pupils should be taught to:

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- Describe the life process of reproduction in some plants and animals.

You could identify and draw the different life cycles of a mammal, amphibian, insect and bird. Then compare the differences between the different life cycles. You could write a comparison. You could identify and draw the process of plants and animals and write a description about them. Then identify the meaning of reproduction, write a definition and think about how they reproduce. You could write an explanation.

Animals, including humans

Pupils should be taught to:

- Describe the changes as humans develop to old age.

You could draw the process that humans go through and then write a description about how they change and what elements means they are moving into the next stage.

Properties and changes of materials

Pupils should be taught to:

- 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.
- Know 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 through filtering, sieving and evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- 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.

You could identify a range of objects within your house and then sort and group them according to their properties. You could create a list. You could investigate how some materials will dissolve and write up your investigation. You could investigate how mixtures can be separated through filtering, sieving and evaporating. You could then write up the experiment or write a description about what happens. You could investigate how some states of matters are reversible by dissolving or mixing some household items.

Earth and space

Pupils should be taught to:

- 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 and the apparent movement of the sun across the sky.





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You could research the movement of the earth and its planets and then write up an explanation or description. You could write a comparison. You could research the movement of the earth and then compare it to other movements. You could research how the earth rotates and how it links to day and night. These can be drawn and written.

Forces

Pupils should be taught to:

- 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.

You could identify what gravity is and write a definition. You could write an explanation about why things fall towards the earth. You could investigate which things fall faster than others and explain why. You could identify the meaning of air resistance, water resistance and friction and write a definition. You could identify what levers, pulleys and gears are and find the different levers, pulleys and gears in your house.

Year 6

Living things and their habitats

Pupils should be taught to:

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

You could identify a range of characteristics and then see if they are true or false for different microorganisms, plants and animals. For example is it cold blooded? Can it live under water? You could then explain the reason for why it could be classified in that way. You could write a report. You could create a 'branch' diagram to identify some plants or animals.

Animals including humans

Pupils should be taught to:

- 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 bodies function.
- Describe the ways in which nutrients and water are transported within animals, including humans.

You could identify and define what the human circulatory system is. Then identify and draw or label the different functions of the heart, blood vessels and blood. You could research how diet, exercise, drugs and lifestyle can affect the body. You could write an explanation or description about this. You could research the process of nutrients and water within the human body and animals. Then draw and label the process.

Evolution and inheritance





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Pupils should be taught to:

- 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.

You could identify the meaning and create a definition of evolution and inheritance. You could create a diagram/drawing about how a living thing can change over time. You could draw the process of changes from something living into a fossil. You could look at your family, if you have siblings, you could compare similarities and differences and which parent/family member you may look like. You could then write a comparison/description. You could look at animals and plants and think about how they have adapted. For example: a fox is a nocturnal animal. How have they changed? Where is their normal habitat? Are foxes' habitats in London? How have they adapted?

Light

Pupils should be taught to:

- Recognise that light appears to travel in straight lines.
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

You could use a torch or lamp to investigate how light travels. You could then draw and label a picture of light traveling. You could investigate this and think about what light may travel through and what it will not. You could then use your knowledge about how light travels to explain how people see things.

Electricity

Pupils should be taught to:

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

You could identify the meaning of electricity. You could think about what might make a light brighter and duller within a circuit. You could think about what switches do to ensure the light turns on and off. You could write an explanation. You could draw a diagram of the circuit using the correct symbols for a simple circuit.

