PKF

SCIENCE

Skills Progression Grid

INTENT

"What I love about science is that as you learn, you don't really get answers. You just get better questions." – John Green

At the Parkland Federation, our aim is to ignite pupils' curiosity and encourage them to confidently explore and discover the world around them . We aim for children to understand how the work of scientists has shaped our world and how they, as scientists, can shape the future.

Through the teaching of carefully tailored lessons, we excite the scientific interest in the children and encourage them to question intelligently, learn through discovery and connect scientific knowledge and understanding to their world.

At The Parkland Federation we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class. Lessons are delivered and resourced to enable equal opportunities to all pupils.The delivery of these lessons considers the needs of all children and is adapted to cater for these individual needs, ensuring that the teaching is appropriate, diverse and inclusive.

IMPLEMENTATION

At the Parkland Federation, our carefully planned curriculum allows the children to take part in a variety of practical scientific investigations. During the process of these investigations, the children acquire specific skills and knowledge to help them ask and answer scientific questions, gain an understanding of scientific processes, plan, record and reason critically the results of the investigations. Additionally, the children apply their mathematical and English skills and develop skills associated with teamwork and cooperation.

We are fortunate to have our own nature garden and vegetable garden and we even keep our own ducks and chickens! These outdoor learning activities provide our children with unique practical hands on experiences that nurture their curiosity.

IMPLEMENTATION AND ASSESSMENT

The staff at the Parkland Federation ensure that all children are exposed to high quality teaching and learning experiences, allowing children to explore their outdoor environment when opportunities arise, maturing their scientific enquiry and investigative skills. All these skills are embedded in each topic and the topics are revisited and expanded as the children journey through school. In addition to these experiences, children are exposed to meaningful cross-curricular links. For example: Let's get cooking (DT); Healthy eating (PSHE); Healthy bodies (PE); and Trips and Clubs.

In order to ensure there is consistency and full curriculum coverage, we assess pupils regularly for this subject using our bespoke online assessment system.

Key Stage	Year Group	Scientific Enquiry	Biology	Chemistry	Physics
Key Stage 1	**1**	The children will: ask simple questions and recognise that they can be answered in different ways. observe closely, using simple equipment. perform simple tests. identify and classify. use my observations and ideas to suggest answers to questions. gather and record data to help answer questions.	**<u>Plants</u>** The children will: 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. **<u>Animals (including humans)</u>** 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.	**<u>Everyday Materials</u>** The children will: 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.	**<u>Seasonal Changes</u>** The children will: observe changes across the four seasons. observe and describe weather associated with the seasons and how day length varies.

Key Stage	Year Group	Scientific Enquiry	Biology	Chemistry	Physics
Key Stage 1	2	The children will: ask simple questions and recognise that they can be answered in different ways. observe closely, using simple equipment. perform simple tests. identify and classify. use observations and ideas to suggest answers to questions. gather and record data to help answer questions.	**Living Things and Their Habitats** The children will: 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. **Plants** 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. **Animals (including humans)** 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.	**Uses of Everyday Materials** The children will: 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.	**No content**

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Key Stage 2	**3**	The children will: ask relevant questions and use different types of scientific enquiries to answer them. set up simple practical enquiries, comparative and fair tests. make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers. gather, record, classify and present data in a variety of ways to help in answering questions. record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. identify differences, similarities or changes related to simple scientific ideas and processes. use straightforward scientific evidence to answer questions or to support findings.	**Plants** The children will: 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. **Animals (including humans)** 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.	**Rocks** The children will: 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.	**Light** The children will: recognise that light is needed in order to see things and that dark is the absence of light. identify 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 a shadow changes. **Forces and Magnets** compare how things move on different surfaces. 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.

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Key Stage 2	**4**	The children will: ask relevant questions and use different types of scientific enquiries to answer them. set up simple practical enquiries, comparative and fair tests. make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers. gather, record, classify and present data in a variety of ways to help in answering questions. record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. identify differences, similarities or changes related to simple scientific ideas and processes. use straightforward scientific evidence to answer questions or to support findings.	**Living Things and Their Habitats** The children will: 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. **Animals (including humans)** 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.	**States of Matter** The children will: 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.	**Sound** The children will: 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. **Electricity** 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.

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Key Stage 2	**5**	The children will: plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. use test results to make predictions to set up further comparative and fair tests. report and present 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. identify scientific evidence that has been used to support or refute ideas or arguments.	**Living Things and Their Habitats** The children will: 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. **Animals (including humans)** describe the changes as humans develop to old age.	**Properties and Changes of Materials** The children will: 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. 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 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.	**Earth and Space** The children will: 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. **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.

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Key Stage 2	**6**	The children will: plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. use test results to make predictions to set up further comparative and fair tests. report and present 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. identify scientific evidence that has been used to support or refute ideas or arguments.	**Living Things and Their Habitats** The children will: describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. give reasons for classifying plants and animals based on specific characteristics. **Animals (including humans)** 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. **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.	**No content**	**Light** The children will: 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. **Electricity** 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.

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Science 2020 - 2021
Infant Subject Leader: Miss Lexi Timms
Junior Subject Leader: Mrs Kate Carver
Subject Skills Reviewed: September 2020