



Clara Grant

**Key Knowledge, Skills and Understanding
and Long Term Plans for 2021/22, 2022/23**

SCIENCE

Knowledge, Skills and Understanding breakdown for Science

EYFS “Understanding the World”

| Characteristics of Effective Learning (Skills) | Knowledge and Interpretation | Early Learning Goal |
|--|--|--|
| <p>Playing and exploring – engagement</p> <ul style="list-style-type: none"> • Finding out and exploring • Playing with what they know • Being willing to ‘have a go’ <p>Active learning – motivation</p> <ul style="list-style-type: none"> • Being involved and concentrating • Keeping trying • Enjoying achieving what they set out to do <p>Creating and thinking critically – thinking</p> <ul style="list-style-type: none"> • Having their own ideas • Making links • Choosing ways to do things | <ul style="list-style-type: none"> • Children can make comments and ask questions about aspects of their familiar world such as the place where they live or the natural world. • They can talk about some of the things they have observed such as plants, animals, natural and found objects. • Children show care and concern for living things and the environment. • Children look closely at similarities, differences, patterns and change. | <p>Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.</p> |

Knowledge, Skills and Understanding Year 1

Working Scientifically

- i) asking simple questions and recognising that they can be answered in different ways
- ii) observing closely, using simple equipment
- iii) performing simple tests
- iv) identifying and classifying
- v) using their observations and ideas to suggest answers to questions
- vi) gathering and recording data to help in answering questions

Animals Including Humans

- i) identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- iii) describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- iv) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

Everyday Materials

- i) distinguish between an object and the material from which it is made
- ii) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- iii) describe the simple physical properties of a variety of everyday materials
- iv) compare and group together a variety of everyday materials on the basis of their simple physical properties

Plants

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

Seasonal Changes

- i) distinguish between an object and the material from which it is made
- ii) identify and name

Working Scientifically

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Animals Including Humans

- i) notice that animals, including humans, have offspring which grow into adults
- ii) find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- iii) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Everyday Materials

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

Plants

- i) observe and describe how seeds and bulbs grow into mature plants.
- ii) find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Living Things Including Humans

- i) 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.
- ii) identify and name a variety of plants and animals in their habitats, including microhabitats.
- iii) 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.

Working Scientifically

- I. asking relevant questions and using different types of scientific enquiries to answer them II. setting up simple practical enquiries, comparative and fair tests
III. making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment
IV. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions V. recording findings using simple scientific language, bar charts, and tables
VI. reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions VII. using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
VIII. identifying differences, similarities or changes related to simple scientific ideas and processes IX. using straightforward scientific evidence to answer questions or to support their findings

Animals Including Humans

- I. 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
II. Identify that humans and some other animals have skeletons and muscles for support, protection and movement

Rocks

- i. compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
ii. describe in simple terms how fossils are formed when things that have lived are trapped within rock
iii. recognise that soils are made from rocks and organic matter

Light

- I. recognise that they need light in order to see things and that dark is the absence of light
II. notice that light is reflected from surfaces
III. recognise that light from the sun can be dangerous and that there are ways to protect their eyes
IV. recognise that shadows are formed when the light from a light source is blocked by an opaque object

Plants

- i. identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
ii. 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
iii. investigate the way in which water is transported within plants

Forces and Magnets

- i. compare how things move on different surfaces
ii. notice that some forces need contact between two objects, but magnetic forces can act at a distance
iii. observe how magnets attract or repel each other and attract some materials and not others
iv. 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
v. describe magnets as having two poles
vi. predict whether two magnets will attract or repel each other, depending on which poles are facing

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Animals Including Humans

- i) describe the simple functions of the basic parts of the digestive system in humans
- ii) identify the different types of teeth in humans and their simple functions
- iii) construct and interpret a variety of food chains, identifying producers, predators and prey

Living Things and their Habitats

- i) recognise that living things can be grouped in a variety of ways
- ii) explore and use classification keys to help group, identify and name a variety of living things in their local and wider
- iii) recognise that environments can change and that this can sometimes pose dangers to living things

Sound

- i) identify how sounds are made, associating some of them with something vibrating
- ii) recognise that vibrations from sounds travel through a medium to the ear
- iii) find patterns between the pitch of a sound and features of the object that produced it
- iv) find patterns between the volume of a sound and the strength of the vibrations that produced it
- v) recognise that sounds get fainter as the distance from the sound source increases

Electricity

- i) identify common appliances that run on electricity
- ii) construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- iii) 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
- iv) recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- v) recognise some common conductors and insulators, and associate metals with being good conductors

States of Matter

- i) compare and group materials together, according to whether they are solids, liquids or gases
- ii) 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)
- iii) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Knowledge, Skills and Understanding Year 5

Working Scientifically

- i. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ii. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- iii. Recording results using scientific diagrams and labels
- iv. Using test results to make predictions to set up further comparative and fair tests
- v. 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
- vi. Identifying scientific evidence that has been used to support or refute ideas or arguments

Animals Including Humans

- i. Describe the changes as humans develop to old age

Living Things and their Habitats

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

Forces

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

Earth and Beyond

- i. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- ii. Describe the movement of the Moon relative to the Earth
- iii. Describe the Sun, Earth and Moon as approximately spherical bodies
- iv. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Properties of and Changes of Materials

- i. Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal)
- ii. Compare and group together everyday materials on the basis of their properties, including their solubility and response to magnets
- ii. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- iii. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- iv. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- v. Demonstrate that dissolving, mixing and changes of state are reversible changes
- vi. 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

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Animals Including Humans

- i) Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- ii) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- iii) Describe the ways in which nutrients and water are transported within animals, including humans

Living Things and their Habitats

- i. 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
- ii. Give reasons for classifying plants and animals based on specific characteristics

Evolution and Inheritance

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

Light

- i. Recognise that light appears to travel in straight lines
- ii. 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
- iii. 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
- iv. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Electricity

- i. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- ii. 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
- iii. Use recognised symbols when representing a simple circuit in a diagram



Clara Grant Science Overview 2021-2022

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 1 |
|-----------|--|----------------------------------|--|-------------------------------------|---|----------------------------------|
| Nursery | How are we the same / different? Changing seasons | | Space | Animals | Life cycle of a chick | Scientific enquiry |
| Reception | Changing seasons and observing how things change and decay over time | | The Polar Regions: Melting / Freezing; | Growing and changing | Habitats | Scientific Enquiry |
| Year 1 | Everyday Materials | Marvelous materials | Identifying animals | My Body | Seasonal changes | Identifying Plants |
| Year 2 | Materials and Matter | Squash, Bend, Twist, Stretch | Super Scientists | Growth and survival | Living in Habitats | Growing Plants |
| Year 3 | Light and Shadow | Rocks and Fossils | Health and Movement | How Plants Grow | Forces and Magnets | ESR Unit: Know Better, Do Better |
| Year 4 | Name That Living Thing | Help Our Habitats | States of Matter | Eating and Digestion | Changing Sound | Circuits and Conductors |
| Year 5 | Earth and Space | Force | Life Cycles | Properties and Changes of Materials | Changes and Reproduction (partly covered in SLT PSHE lessons) | ESR Unit: People and Planet |
| Year 6 | Evolution and Inheritance | Living Things and their Habitats | Classifying Organisms | Healthy Bodies | Seeing Light | Changing Circuits |

ESR-Education for Social Responsibility: Themes- Climate Change and Finite Planet



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| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 1 |
|-----------|--|--------------------------|---|-------------------------------------|---|---|
| Nursery | How are we the same / different? Changing seasons | | Space | | Observing changes and growth: Chicks | Minibeasts & the wormery |
| Reception | Changing seasons and observing how things change and decay over time | | The Polar Regions: Melting / Freezing; Animals and Habitats | | Planting and Growing | Lifecycles - Frogspawn and Caterpillars |
| Year 1 | Everyday materials | Seasonal changes | Identifying animals | My Body | Identifying Plants | ESR Unit: Our Changing World |
| Year 2 | Exploring Everyday Materials | Growth and survival | Super Scientists | Living in Habitats | Growing Plants | ESR Unit: Where does this come from? |
| Year 3 | Light and Shadow | Rocks, Fossils and Soils | Health and Movement | How Plants Grow | Forces and Magnets | ESR Unit: Know Better, Do Better |
| Year 4 | Living in Environments | Circuits and Conductors | States of Matter | Eating and Digestion | Changing Sound | ESR Unit: Reduce, Reuse, Recycle |
| Year 5 | Earth and Space | Forces in Action | Life Cycles | Properties and Changes of Materials | Changes and Reproduction (partly covered in SLT PHSE lessons) | ESR Unit: People and Planet |
| Year 6 | Evolution and Inheritance | Classifying Organisms | Healthy Bodies | Seeing Light | Changing Circuits | ESR Unit: Circular Economies |

ESR-Education for Social Responsibility
Themes- Climate Change and Finite Planet