Science Curriculum Progression

By the end of year 6 children at RAB should demonstrate the following essential characteristics of scientists:

- A love of science and scientific exploration
- A sound scientific knowledge and conceptual understanding of biology, chemistry and physics topics, which they can demonstrate using scientific vocabulary
- An appreciation of how scientists in the past have contributed to our knowledge of the world around us, as well as an understanding of the uses and implications of science today, and in the future
- The ability to ask questions and show an understanding of the processes and methods of science through different types of science enquires that help them answer specific questions about the world around them
- Confidence when using a range of scientific equipment and the ability to make observations, record data appropriately and draw accurate conclusions
- An open mind and ability to evaluate results and facts, showing an awareness of potential sources of error
- A respect for the ideas and contributions of others, demonstrated through their ability to collaborate effectively in teams, in order to carry out scientific investigations and conduct research
- Resilience and motivation to embrace challenging activities

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working scientifically	• I have my own ideas and can explain my thinking, making links with my experiences. • I test my ideas through trial and error, choosing resources available in play. • I question why things happen. • I notice similarities and differences. • I can use my senses and look closely.	• 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 their observations and ideas to suggest answers to questions • gather and record data to help in answering questions		• ask relevant questions and use different types of scientific enquiries to answer them • set up simple practical enquiries, comparative and valid tests. • make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gather, classify and present data in a variety of ways to help to answer questions • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • use results to draw simple conclusions, work in groups to suggest improvements and raise further questions • identify differences, similarities or changes related to simple scientific ideas and processes • use straightforward evidence to answer questions or to support their findings		• 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, 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 comparative and valid 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 • use appropriate scientific language and ideas from the National Curriculum to communicate methods and findings • describe and evaluate their own and other people's scientific ideas (including ideas that have changed over time), using evidence from a range of sources • find things out using a wide range of secondary sources of information	

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Plants	• explore the natural world around them • describe what they see, hear and feel outside	• 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	• 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 • describe how different plants have different needs	• 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			

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Animals, including humans **(+ Y6 Evolution and Inheritance)**	• make observations of animals • know about some factors that support their overall physical health and wellbeing	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense • 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,	• find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe animals and their offspring • 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	• 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 • identify and name the main parts of the

		amphibians, reptiles, birds and mammals, including pets)					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

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Everyday materials **Use of everyday materials (Year 2)** **States of matter (Year 4)** **Properties and changes of everyday materials (Year 5)**	• understand some important processes and changes in the natural world including changing states of matter (e.g. ice melting; rainwater freezing; mud drying out/ getting soggy)	• 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	• 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		• compare and group materials together, according to whether they are solids, liquids or gases • explain the properties of solids, liquid and gases (e.g. solids have a fixed shape, liquids take the shape of a container and gases expand to fill a container) • 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	• compare and group together everyday materials on the basis of their properties, including their hardness, transparency and response to magnets • investigate the thermal conductivity of materials • 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 valid 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	

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Forces (Year 5) **Forces & Magnets** (Year 3)				• 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 and predict whether two magnets will attract or repel each other, depending on which poles are facing		• 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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Seasonal Changes (Year 1 only)	• describe what they see, hear and feel outside • understand the effect of the changing seasons on the natural world around them	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies					

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Earth and Space			• describe the Sun, Earth and Moon as approximately spherical bodies • know the order of the plants from the Sun • 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 • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky • recognise that light from the sun can be dangerous and that there are ways to protect their eyes			• describe the heliocentric model of the solar system, developed by Copernicus and Kepler • explain the movement of the Moon relative to the Earth and how this causes the phases of the Moon • describe the two ways in which the Earth moves in space and their effects	

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Living things and their habitats	• know some similarities and differences between the natural world around them and contrasting environments, drawing on experiences and what has been read in class		• 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 micro-habitats • 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		• 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	• 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	• 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

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Rocks **Evolution and Inheritance**				• 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			• 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

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Light **Sound**				• recognise that light is needed in order to see things and that dark is the absence of light • classify materials, understanding the terms transparent, translucent and opaque • notice that light is reflected from surfaces • recognise that shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows change	• 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		• 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 • investigate and explain the effects of refraction • use knowledge of reflection and refraction to explain how we see colours

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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		• 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