Year 1 SCIENCE **(Please note all objectives in bold are statutory and must be taught.)**

Brindishe Federation

Content	Objectives	Vocabulary	Scientists	Working scientifically
Plants	**Identify & name a variety of common wild and garden plants, including deciduous & evergreen trees.** **Identify & describe the basic structure of a variety of common flowering plants, including trees.** Classify leaves, flowers, and seeds, choosing their own criteria. Observe a tree through the year. Observe a trail/patch to identify how plants change through the year. Identify patterns e.g. after comparing the size of leaves on different plants, children may suggest "bigger plants have bigger leaves." Use secondary sources to name plants (including trees).	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area	Beatrix Potter, Alan Titchmarsh	**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.**
Animals, including humans	**Identify & name a variety of common animals including fish, amphibians, reptiles, birds & mammals.** **Identify & name a variety of common animals that are carnivores, herbivores, omnivores.** **Describe & compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, mammals, including pets).** **Identify, name, draw, label basic parts of a human body & say which part of the body is associated with each sense.** Classify animals they have seen/have first-hand experience of, choosing their own criteria to do so, e.g. physical structure. Classify animals they have first-hand experience of based on what they eat (plants, other animals, both). (Complete this after the research.) Children generate questions for investigation such as: 'Do people with longer arms have longer legs?' Use secondary sources to name unknown animals seen in the local environment.	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Names of animals experienced first-hand from each vertebrate group Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue	Chris Packham	
Everyday materials	**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.** Classify and group objects made from the same material and the same object made from different materials, considering absorbency, transparency and texture. Test objects made of different materials to see how effective they are e.g. umbrellas/hats/coats for waterproofness, cloths/nappies for absorbency, different papers for writing on/painting etc.	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through	Charles Macintosh	**Working scientifically vocabulary** questions, answers, equipment, gather, measure, record, results, sort, group, test, explore, observe, compare, describe, similar/similarities, different/differences, egg timers, ruler, tape measure, metre stick, beaker, pipette, syringe
Seasonal changes	**Observe changes across the four seasons.** **Observe and describe weather associated with the seasons and how day length varies.** Make observations of weather. Record and photograph local environment over time. At the end of the year, look for patterns in evidence e.g. 'Does it rain more in spring? Do we have more sunny days in the summer? Which was the coldest month?'	Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length	Carol Kirkwood, Tomasz Schafernaker	

Year 2 SCIENCE **(Please note all objectives in bold are statutory and must be taught.)**

Brindishe Federation

Content	Objectives	Vocabulary	Scientists	Working scientifically
Living things and their habitats	**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.** Find and classify things that are living, dead, never been alive. Classify minibeasts and plants found in the environment. Explore animals and plants in micro-habitats throughout the year (e.g. under a rock, under a log). Children generate questions for investigation such as: 'Where do you see more ivy? Where do snails live?' Use secondary sources to name unknown plants and animals seen in the local environment.	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.	Jane Goodall, Steve Irwin	**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.**
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.** Based on the children's own criteria: classify and group seeds and bulbs. Plant seeds and bulbs and observe how they grow. Children generate questions for investigation such as: 'Do big seeds germinate more quickly? Does it matter which way round you plant a bulb or seed?' Look at packets to decide how to plant and care for seeds.	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Names of animals experienced first-hand from each vertebrate group Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue	Charlie Dimmock, Percy Thrower	
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.** Based on the children's own criteria, classify and group food items and animals. Observe a life cycle (e.g. caterpillars, chicks, farm animals). Observe how their body changes during/after exercise. Research adult animals and their young	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	Dina Asher-Smith, Adam Gemili, Florence Nightingale, Mary Seacole	**Working scientifically vocabulary** See previous years. pictogram, tally chart, block diagram, Venn diagram, order, link, stop watch
Use of everyday materials	**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.** Based on the children's own criteria, classify materials e.g. samples of wood, metal, plastic, etc. Test materials for different uses, e.g. Which material can you use to make an aeroplane? Which fabric would you use for curtains? Which materials are best for Cinderella's mop?	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through	John Boyd Dunlop	

Year 3 SCIENCE **(Please note all objectives in bold are statutory and must be taught.)**

Brindishe Federation

Content	Objectives	Vocabulary	Scientists	Working Scientifically
Plants	**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.** Gather seeds and photographic evidence of blossoms/flowers and berries on a particular trail throughout the year. Investigate what happens when conditions are changed e.g. more/less light/water, change in temperature, nutrients (Baby Bio vs other brands).	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal	David Bellamy, Gertrude Jekyll	**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 &, 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**
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.** Based on the children's own criteria, sort food items based on their nutrients and classify animals by whether or not they have a skeleton. Children generate questions for investigation such as: Do 'healthy' drinks have less sugar? Do people with long arms throw further?	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints	Leonardo da Vinci	
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.** **Recognise that soils are made from rocks and organic matter.** Look at different soils and discuss how they are similar/different. Observe how soil separates into different layers in water.	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/ chalk/clay soil	Mary Anning	
Light	**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.** Based on the children's own criteria, classify light sources (leading to man-made/natural) and classify materials (leading to reflective/non-reflective, transparent/translucent/opaque). Investigate shadows (size of shadows, shape of shadows). NB Do not look at how shadows in the playground change throughout the day.	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	Isaac Newton	
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.** Based on the children's own criteria: sort materials (leading towards metal/non-metal and magnetic/not magnetic); sort toys (leading to what makes them move e.g. push/pull). Test the strength of different magnets. Find out how magnets are used in everyday life.	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	Magnets- William Gilbert	**Working scientifically vocabulary** See previous years. questions, types of scientific enquiry, answer, changes, comparative tests, fair tests, careful, accurate, observations, present, data/evidence/results, keys, bar charts, results, conclusions, prediction, support/not support, thermometers, data loggers, magnifying glass, microscope

Year 4 SCIENCE **(Please note all objectives in bold are statutory and must be taught.)**

Brindishe Federation

	Objectives	Vocabulary	Scientists	Working Scientifically
Living things and their habitats	**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.** Introduce branching databases/dichotomous keys. Research and be able to name plants/animals in the wider environment e.g. polar, desert etc. Research global environmental issues and their impact on living things.	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	David Attenborough	**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 &, 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.**
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.** Compare and contrast different types of teeth (linking to simple functions). Classify jaw bones/teeth to aid with making food chains e.g. recognise what eats plants and what eats animals by looking at their teeth. Research what different animals eat within a specific environment, e.g. coral, polar, African grasslands, in order to construct food chains.	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Zhaoming Liu, William Beaumont	
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 (°C).** **Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.** Based on the children's own criteria, classify solids and liquids (including grains, crystals, powders: physical properties) What affects the melting rate of chocolate? Test the 'runniness' of liquids or which liquids freeze. Research the melting point of metals. Research the water cycle.	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle	Antoine Lavoisier	
Sound	**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.** Measure volume from different instruments. Measure how volume changes away from a source. Investigate string telephones. Explore pitch e.g. through a carousel of activities.	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	Alexander Graham Bell	
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.** Based on the children's own criteria, classify household appliances and/or toys (leading to electrical/not electrical, batteries/ mains). Test materials to classify into insulators and conductors.	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	Humphry Davy and Thomas Edison	**Working scientifically vocabulary** See previous years. increase, decrease, appearance

Year 5 SCIENCE **(Please note all objectives in bold are statutory and must be taught.)**

Brindishe Federation

Content	Objectives	Vocabulary	Scientists	Working Scientifically
Living things and their habitats	**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.**	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Dian Fossey	**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.**
	Classify animals according to their life cycle. Grow from cuttings and observe whether they grow roots/stem/leaf/flower. Generate questions such as 'do larger animals have longer gestation periods?' Research life cycle of a chosen animal and present in a variety of ways.			
Animals, including humans	**Describe the changes as humans develop to old age.**	Puberty: the vocabulary to describe sexual characteristics	Robert Winston	
	Develop questions to ask an expert e.g. doctor.			
Properties and changes of materials	**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.**	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material	Marie Curie, Spencer Silver	
	After observing what happens when solids are added to liquids, classify materials based on the outcomes. Observe rusting with uncoated nails in different liquids. Compare rates of solubility. Burn different materials			
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 and the apparent movement of the sun across the sky.**	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets	Caroline Herschel, Copernicus Ptolemy	
	Measures shadows throughout the day. Generate questions to research about Earth and Space.			
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.**	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	Heath Robinson, Rube Goldberg, Leonardo da Vinci - helicopters	**Working scientifically vocabulary** See previous years. opinion/fact, variables, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute
	Compare friction e.g. different objects pulled or pushed by a forcemeter. Compare water resistance e.g. plasticine in a cylinder of liquid (more viscous liquid is easier). Compare air resistance e.g. spinners, parachutes. Compare levers and pulleys.			

Year 6 SCIENCE **(Please note all objectives in bold are statutory and must be taught.)**

Brindishe Federation

Content	Objectives	Vocabulary	Scientists	Working Scientifically
Living things and their habitats	**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.** Classify plants into flowering, mosses, ferns, conifers. Create a branching key to help classify living things without support. Research unusual animals. Research the difference between fungus, bacteria and virus.	Vertebrates, fish, amphibians, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering	Carl Linnaeus	**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.**
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.** Observe pulse rates before, during and after exercise. Generate pattern seeking questions such as 'do older people have lower pulse rates?' Research the human circulatory system.	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle	Gerty Curi, Fabrici, Barnard	
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**. Classify a species of animal or plant to show variation in a species. Use different equipment to pick up available food to look for patterns in the suitability of bird beaks. Research how animals are adapted to different habitats.	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils	Charles Darwin, Rosalind Franklin	
Light	**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 the shape of shadows and link this to light travelling in straight lines.	As for year 3 (Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous) plus straight lines, light rays.	Alhazen, Aristotle	**Working scientifically vocabulary** See previous years. true value, anomaly, error, reliable
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.** Investigate the effect of adding more bulbs/cells/buzzers/motors to a circuit.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage	Benjamin Franklin, Nikola Tesla	