St. John's C.E. Primary
Friern Barnet

SCIENCE GUIDELINES

Statement of Intent

To deliver a curriculum which inspires every pupil to be inquisitive about the world around them - so that they know more, remember more, understand more and be more able to transfer their skills to new areas of learning. They will:

- develop their crucial scientific enquiry skills for now and the future; be able to apply these across all areas of science learning. These include planning investigations, predicting, recording, evaluating and analysing, building arguments and explaining concepts
- develop their language skills in science to use vocabulary with understanding and confidence: to use language to convey their ideas, learning and skills articulately
- understand about the role of science in everyday lives through outings, school based workshops and using the whole school environment.

Association of Science in Education Membership

The school belongs to the Association of Science in Education which provides support for the teaching of science across the whole primary age range thus enabling teachers to keep up to date with current practices in the teaching and learning of science and access to a wide range of teaching resources.

The interest of young people in science is developed by inspiring and knowledgeable teachers. From local events to national policy, the Association is a professional community dedicated to supporting excellence in science teaching and learning.

Implementation

These notes provide guidelines for the delivery of Science across Key Stage 1 and Key Stage 2 at St. John's School. Responsibility for the delivery of these programmes of study for each year group rests with the class teacher, supported by the science leader. This document must be read in conjunction with the National Curriculum Programmes of Study with particular reference to the key stage you teach within.

General consideration should be given to the following:

- science lessons should include a significant time devoted to well-planned and organised practical investigations (supported by the TAPs programme through the PSTT) alongside shorter practical activities during more knowledge-based lessons

- safe practice: while we understand science need to provide time for children to explore, it must always remain safe for them to do so, by using appropriate resources and experiences, with pupils being taught correct and safe use of scientific equipment
- resources: including not just traditional scientific equipment available but a range of media to inspire pupils such as POWERPOINTS, Yes Programme, concept cartoons, Explorify, BBC Bitesize (and film clips), TAPs Activities through Bathspa university
- outings and workshops planned in order to deepen children's understanding of science in the classroom and to broaden their minds to the world of science outside the classroom, enabling them to have purpose in their learning back in the classroom
- science days/extended science lessons as appropriate to extend and challenge pupils' understanding
- planning, skills and knowledge (practical v knowledge-based) and delivery of science programme through topics (Cornerstone projects), standalone science to also incorporate elements of TAPs assessment activities
- recording in different ways: notes, bullet points, post its, reports, thought bubbles, mind maps, thought showering, etc
- CPD and teacher knowledge through INSET and class teachers personal research/study, supported by science leader

Science Overview (MINI TOPICS IN BRACKETS as appropriate)

Includes vocabulary to be learned (skills vocabulary in red)

	Autumn		Spring		Summer	
Y1 **Your focus scientist for the year is:** Amelia Earhart	Childhood Plants • Identify and name a variety of common trees including deciduous and evergreen.	Christmas Animals inc. Humans • Identify and name a variety of common animals including fish, amphibians,	Bright lights Big city • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Seasonal changes • Observe changes across the four seasons •Observe and describe weather	Schooldays Plants • Identify and name a variety of common wild and garden plants.	Everyday materials • Identify and name a variety of everyday materials, including wood, plastic, glass,

		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) TAPs activity: Teddy zipline (Staff shared drive: Science info:TAPs activities to try) Focus: planning	TAPs activity: Taste test (Staff shared drive: Science info:TAPs activities to try) Focus: evaluating	associated with the seasons and how day length varies. • Identify and describe the basic structure of a variety of common flowering plants, including trees. *TAPs activity: Shades of colour in the playground (Staff shared drive: Science info:TAPs activities to try)* *Focus: observation*	• Identify and describe the basic structure of a variety of common flowering plants, including trees.	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. • Distinguish between an object and the material from which it is made. TAPs activity: Scavenger Sort (Staff shared drive: Science info:TAPs activities to try) Focus: doing

Vocabulary	leaf trunk petal roots seed observe diagram	carnivore herbivore omnivore compare group	ears nose eyes tongue senses identify group	weather season Spring Summer Autumn Winter record	fruit seed flower bulb describe	material shiny waterproof absorb explore question
Y2 **Your focus scientist for the year is:** Charles Henry Turner	*Movers and Shakers (Living things and their habitats, Humans Y2)* <u>Animals inc. Humans</u> • 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. Cornerstones practical unit =germs: germs: focus on	*Movers and Shakers* <u>Animals inc. Humans</u> • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans) • Identify that most living things live in habitats to which they are suited and describe how different habitats	Coastlines (everyday materials & their uses) • Explore and compare the differences between things that are living, dead, and things that have never been alive • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses TAPs activity: Scavenger Sort (classifying materials) Focus: observing	Coastlines <u>Cornerstones project: Sinking & floating</u> <u>Forces</u> find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching <u>Plants</u> • Observe and describe how seeds and bulbs	Magnificent Monarchs (Animals Y2) <u>Living things and their habitats</u> • Identify and name a variety of plants and animals in their habitats, including microhabitats • Identify that most living things live in habitats to which they	Scientist focus:Charles Henry Turner: research and fact finding and presenting information

	predicting and observing	provide for the basic needs of different kinds of animals and plants, and how they depend on each other		grow into mature plants • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. TAPs activity: Browning apples (Staff shared drive: Science info:TAPs activities to try) Focus: prediction	are suited and describe how different habitats provide for the basic needs of different kinds of animals • 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 and plants, and how they depend on each other *TAPs activity: making butter (Staff shared drive: Science info:TAPs activities to try) Focus: recording and communicating*	
Vocabulary	foodchain energy food shelter diagram question	habitat micro-habitat characteristic egg spawn chart classify observe	material property compare record identify classify	force healthy bulb temperature compare	survival exercise nutrition life processes measure question	research question present
Y3 **Your focus scientist for the year is:**	Through the ages <u>Animals inc. Humans</u> • Identify that animals, including humans, need the	<u>Animals inc. Humans</u> • Identify that humans and some other animals have	Rocks, relics and rumbles * Compare and group together different kinds of rocks on the basis of their appearance and	(Forces and magnets) <u>Forces</u> • Compare how things move on	Emperors and Empires <u>Light</u> • Recognise that they need light in order to see things and that dark is the absence of light	

Mary Anning	right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat TAPs activity: Ice cream (Staff shared drive: Science info:TAPs activities to try) Focus: observation	skeletons and muscles for support, protection and movement	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	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	• 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 <u>Living things and their habitats</u> • 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

				attract or repel each other, depending on which poles are facing TAPs activity: Cupcake parachutes (Staff shared drive: Science info:TAPs activities to try) Focus: planning	TAPs activity: Daisies in a footprint (Staff shared drive: Science info:TAPs activities to try) Focus: predicting
Vocabulary	Nutrient Protein fats Carbohydrates observe	Skeleton Exoskeleton support protection movement investigate	Rock Permeable Impermeable Crystals Palaeontologist Compare describe	Force Magnet attract repel method	Germinate Pollen Pollination stamen predict
Y4 **Your focus scientist for the year is:** Lewis Latimer	Invasion <u>Animals inc. Humans</u> • Describe the simple functions of the basic parts of the digestive system in humans.	<u>Sound</u> • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel	MIsty Mountain Winding River <u>Living things and their habitats</u> • Recognise that living things can be grouped in a variety of ways • Explore and use classification keys to	<u>Materials</u> .• Compare and group materials together, according to whether they are solids, liquids or gases.	Ancient civilizations <u>Electricity</u> • 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 the different types of teeth in humans and their simple functions. TAPs activity: Eco action (Staff shared drive: Science info:TAPs activities to try) Focus: recording and communicating	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.	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. • Construct and interpret a variety of food chains, identifying producers, predators and prey • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature TAPs activity: Ice escape(Staff shared drive: Science info:TAPs activities to try) Focus: observing and measuring TAPs activity: Separating colours (Staff shared	• 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 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.

			drive: Science info:TAPs activities to try) Focus: questioning			
Vocabulary	Molar Incisor Canine Enamel Decay Digestion Oesophagus Stomach intestine Anus record communicate	Vibration Pitch volume length explain pattern	Classify Organism Vertebrate Invertebrate animal kingdom plant kingdom observation measure	Solid Liquid Gas particle Celsius temperature melting point freezing point boiling point group measure	Battery Mains Rechargeable Cell Bulb Circuit Component recognise identify	
Y5 **Your focus scientist for the year is:** Katherine Johnson	Topic: Dynamic Dynasties <u>Forces</u> • 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	Topic: Dynamic Dynasties (continued) <u>Space</u> • 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	Topic: Sow, Grow and Farm <u>Animals inc. Humans</u> • Describe the changes as humans develop to old age	Topic: Sow, Grow and Farm (continued) <u>Living things and their habitats</u> *Describe the life process of reproduction in some plants and animals. *Describe the differences in the life cycles of a mammal, an	Topic: Ground-breaking Greeks <u>Properties and changes of materials</u> • Compare and group together everyday materials on the basis of their properties, including their	Topic: Ground-breaking Greeks (continued) <u>Consolidation of taught learning</u> 1) TAPs activity: Cornflour Slime Focus: Questioning 2)TAPs activity: Zipline testing (Staff shared drive: Science info:TAPs activities to try)

	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. TAPs activity: Bottle flip (Staff shared drive: Science info:TAPs activities to try) Focus: recording and communicating	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. TAPs activity: Craters (Staff shared drive: Science info:TAPs activities to try) Focus: predicting		amphibian, an insect and a bird. • Describe the life process of reproduction in some plants and animals. TAPs activity: Jump Patterns Focus: Interpret and report	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	Focus: Set up enquiry

					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.	

Vocabulary	Friction Air resistance Water resistance Gravity Weight Newton mechanism Reliability results communicate	Solar System sun star planet sphere Orbit prediction explanation	adolescence puberty menstruation	bulb pollination Fertilisation reproduction stamen stigma ovule Interpret report	solution solute solvent dissolve evaporate mixture, soluble insoluble, filter, reversible/physical change Irreversible/chemical change observation	 Interrogate Investigate Enquiry Independent variable dependent variable
Y6 **Your focus scientist for the year is:** Alfred Russel Wallace	Maafa (**standalone)** <u>Animals inc. Humans</u> • 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. *Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.		Frozen Kingdoms • 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.	Frozen Kingdoms • 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	Britain at War <u>Living things and their habitats</u> 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.	

	• 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 TAPs activity: shoulder stands (Staff shared drive: Science info:TAPs activities to try) Focus: recording	• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram	TAPs activity: Terrific tasters (Staff shared drive: Science info:TAPs activities to try) Focus: observation Research activity: Darwin/Anning self directed study Focus: research
vocabulary	classification organism characteristic classify organ heart brain blood vessel blood cell artery vein capillary circulatory system oxygen pulse rate accuracy	light ray shadow reflection scatter blocked light source opaque transparent transcluent dependent variable independent variable prediction diagram annotate measurement	mains circuit cell flow electrons component bulb brightness symbol buzzer switch wire observation conclusion results evaluate	fossil offspring nutrition prey predator adaptation evolution survival habitat gene rock strata inheritance selective breeding scientific evidence research report comparative interpret

	variable			analyse