Westhead Lathom St James' CE Primary School

Year 3 and 4

Science

Questions to Develop Children's Spirituality in Science:	Do you believe there is creator of the earth? Do you believe in evolution, that humans came from monkeys and we all developed from fish? Does the theory of evolution mean you are just a monkey? Are you just a pile of atoms? In what ways are you like your parents (made in their image)? What is it like to be made in the image of God? Why is it that no two people on the earth are exactly the same- not even twins? Is your behaviour learnt of inbuilt- are we naturally selfish? When you look around at the wonders of the natural world do you think these things were created by accident or by design?
Development of the child:	Questioning, wonder, critical mind, reasoning and awe.

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Topic: How Does Your Garden Grow?- Plants **Subject:** Science	**Prior Knowledge/Links:** Growth and Green Fingers- Plants (Y1/2) The Farm Shop - Plants (Y1/2) **Children should already know:** • a variety of common wild and garden plants, including deciduous and evergreen trees. • the basic structure of a variety of common flowering plants, including trees. • how seeds and bulbs grow into mature plants. • how plants need water, light and a suitable temperature to grow and stay healthy.	
National Curriculum Objectives	**Key Knowledge and Vocabulary**	
Plants (Y3) 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) 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.	• Know the different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Know the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow). • Know that the requirement for growth can vary from plant to plant. • Know how water is transported within plants. • Know the part that flower play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • Know that roots grow downwards and anchor the plant, • Know that water, taken in by the roots, goes up the stem to the leaves, flowers and fruit. • Know that nutrients (not food) are taken in through the roots. • Know that stems provide support and enable the plant to grow towards the light. • Know that plants make their own food in the leaves using energy from the sun • Know that flowers attract insects to aid pollination. • Know that pollination is when pollen is transferred between plants by insects, birds, other animals and the wind. • Know that seeds are formed after the flowers are pollinated. • Know that many flowers produce fruits which protect the seed and/or aid seed dispersal. • Know that Seed dispersal, by a variety of methods, helps to ensure that new plants survive. • Know that plants need nutrients to grow healthily (either naturally from the soil or from fertiliser added to soil).	function roots stem trunk nutrients transported pollination life cycle seed formation seed dispersal germination

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Topic: Marvellous Creations- Animals, including humans **Subject:** Science	**Prior Knowledge/Links:** Animals – Animals, including humans (Y1/2) Robots – Animals, including humans (Y1/2) **Children should already know:** 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 and draw and label the basic parts of the human body and say which part of the body is associated with each sense.	
National Curriculum Objectives	**Key Knowledge and Vocabulary**	
Animals, including humans (Y4) 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.	• Know the basic parts of the digestive system in humans • Know the simple functions of the basic parts of the digestive system in humans. • Know the producer, predator and prey in a food chain. • Know the types of teeth humans have. • Know the function and position of human teeth in the mouth. • Know what damages teeth. • Know how teeth and gums have to be cared for in order to keep them healthy. • Know the differences between the teeth of carnivores and herbivores and the reasons for this.	digestive predator/prey carnivore herbivore omnivore stomach intestines large/small intestines oesophagus stomach duodenum liver gall bladder pancreas saliva saliva glands mouth teeth molars incisors pre-molars canines

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<table>
<tr><td>Topic: The Iron Man-Forces and Magnets

Subject: Science</td><td colspan="2">Prior Knowledge/Links:
Great Outdoors- Everyday Materials (Y1/2)
Buckets and Spades- Use of Everyday Materials (Y1/2)
Inventors and Inventions- Forces (Y5/6)

Children should already know:
how to distinguish between an object and the material from which it is made.
a variety of everyday materials, including wood, plastic, glass, metal, water and rock.
the simple physical properties of a variety of everyday materials.
how to compare and group together a variety of everyday materials on the basis of their simple physical properties
how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
how the shapes of solid objects made from certain materials can be changed by squashing, bending, twisting and stretching.</td></tr>
<tr><td>National Curriculum Objectives</td><td colspan="2">Key Knowledge and Vocabulary</td></tr>
<tr><td>Forces and Magnets (Y3)
Compare how things move on different surfaces.
Notice that some forces need contact between 2 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 material on the basis of whether they are attracted to a magnet and identify some magnetic materials.
Describe magnets as having 2 poles
Predict whether 2 magnets will attract or repel each other depending in which poles are facing.</td><td>Know how objects can move on different surfaces.
Know that some forces need contact between two objects.
Know that magnetic forces can act at a distance.
Know how magnets attract or repel each other.
Know how magnets attract some materials and not others.
Know that magnets have two poles.
Know if magnets will attract or repel each other, depending on which poles are facing each other.
Know the everyday uses of different magnets (bar, ring, button, horseshoe).
Know that different magnets have different strengths</td><td>move/movement
surfaces
push/pull
forces
contact
distance
magnet
magnetic
attract
repel
poles
bar magnet
ring magnet
horseshoe magnet
magnetic materials</td></tr>
</table>

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Science

<table>
<tr><td>Topic: Water, Water- States of Matter

Subject: Science</td><td colspan="2">Prior Knowledge/Links:
Great Outdoors- Everyday Materials (Y1/2)
Buckets and Spades- Use of Everyday Materials (Y1/2)
A Kingdom United- Properties and Changes of Materials (Y5/6)
Food, Glorious Food – Properties and Changes of Materials (Y5/6)

Children should already know:
how to distinguish between an object and the material from which it is made.
a variety of everyday materials, including wood, plastic, glass, metal, water and rock.
the simple physical properties of a variety of everyday materials.
how to compare and group together a variety of everyday materials on the basis of their simple physical properties
how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
how the shapes of solid objects made from certain materials can be changed by squashing, bending, twisting and stretching.</td></tr>
<tr><td>National Curriculum Objectives</td><td colspan="2">Key Knowledge and Vocabulary</td></tr>
<tr><td>States of matter (Y4)
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.
Identify the part played by evaporation and condensation in the water cycle and the associate rate of evaporation with temperature</td><td>Know how to group a material according to whether they are a solid, liquid or gas, by their observable properties.
Know that solids have a fixed size and shape
Know that the size and shape of a solid can be changed, but it remains the same after the action.
Know that liquids can pour and take the shape of the container in which they are put.
Know that liquids form in a pool not a pile.
Know that solids in the form of powders can pour as if they were liquids but make a pile not a pool.
Know that gases fill the container in which they are put.
Know that gases escape from an unsealed container.
Know that gases can be made smaller by squeezing/pressure.
Know that liquids and gases can flow.
Know the effect of temperature on water and ice
Know how liquids can evaporate over time.
Know that the rate of evaporation can be altered according to temperature.
Know the different stages of the water cycle including evaporation, condensation, precipitation.</td><td>solid
liquid
gas
temperature
heat/heating
cool/cooling
melt/melting
freeze/freezing
water cycle
evaporation
condensation
precipitation
water vapour
states of matter</td></tr>
</table>

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<table>
<tr><td>Topic: Healthy Humans- Animals, including humans

Subject: Science</td><td colspan="2">Prior Knowledge/Links:
Animals- Animals, including humans (Y1/2)
Robots- Animals, including humans (Y1/2)
Fighting Fit- Animals, including humans (Y1/2)
Higher, Faster, Stringer- Animals, including humans (Y5/6)
Heroes and Villains- Animals, including humans (Y5/6)

Children should already know:
animals, including humans, have offspring which grow into adults.
the basic needs of animals, including humans, for survival (water, food and air)
the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</td></tr>
<tr><td>National Curriculum Objectives</td><td colspan="2">Key Knowledge and Vocabulary</td></tr>
<tr><td>Animals, including humans (Y3)
Identify that animals, including humans, need the right types and amount of nutrition.</td><td>Know that animals, including humans, need the right types and amount of nutrition.
Know that animals, including humans, cannot make their own food; they get nutrition from what they eat.
Know that an adequate and varied diet is beneficial to health.
Know that a good supply of oxygen is beneficial to health.
Know that clean water is beneficial to health.
Know that regular and varied exercise from a variety of different activities is beneficial to health.
Know the diets of different animals (including pets).
Know how to group animals according to what they eat.
Know how different food groups keep us healthy.</td><td>nutrition
diet
skeleton
varied
oxygen
beneficial
omnivore
herbivore
carnivore
health/healthy
food chains</td></tr>
</table>

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Science

<table>
<tr><td>Topic: Rock and Roll- Rocks and Soils

Subject: Science</td><td colspan="2">Prior Knowledge/Links:
Great Outdoors- Everyday Materials (Y1/2)
Buckets and Spades- Use of Everyday Materials (Y1/2)
Survival – Evolution and inheritance (Y5/6)

Children should already know:
how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.
the simple physical properties of a variety of everyday materials.
how to compare and group together a variety of everyday materials on the basis of their simple physical properties
how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</td></tr>
<tr><td>National Curriculum Objectives</td><td colspan="2">Key Knowledge and Vocabulary</td></tr>
<tr><td>Rocks (Y3)
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.</td><td>Know how to group different kinds of rocks on the basis of their appearance and simple physical properties.
Know how to describe, in simple terms, how fossils are formed when things that have lived are trapped within a rock.
Know that soils are made from rocks and organic matter.
Know the similarities and differences between rocks.
Know the similarities and differences between soils (hardness, permeability).
Know that rocks and soils can be different in different places/environments.
Know how and why rocks used in buildings might have changed over time.
Know how to use a hand lens/microscope to identify and classify rocks according to whether they have grains or crystal and whether they have fossils in them.
Know the different kinds of living things whose fossils are found in sedimentary rock.</td><td>soil
rock
fossil
organic material
grains
crystals
sedimentary rock
igneous rock
metamorphic rock
formation
hardness
permeability/permeable
properties
purposes/uses
pressure
heat
decay</td></tr>
</table>

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Topic: Sparks Might Fly- Electricity **Subject:** Science	**Prior Knowledge/Links:** Oh I Do Like to Be Beside the Seaside- Electricity (Y5/6) **Children should already know:** • N/A	
National Curriculum Objectives	**Key Knowledge and Vocabulary**	
Electricity (Y4) Identify some 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.	• Know that common appliances run on electricity. • Know how to construct a simple series electrical circuit. • Know how to identify and name the basic parts of a simple series electrical circuit, including cells, wires, bulbs, switches and buzzers. • Know if a lamp will light or not in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Know that a switch opens and closes a circuit. • Know some common conductors and insulators. • Know that metals are good conductors. • Know that electricity can be dangerous. • Know that electrical sources can be mains or battery. • Know that batteries 'push' electricity round a circuit which can make bulbs, buzzers and motors work. • Know that faults in circuits can be found by methodically testing connections. • Know that drawings, photographs and diagrams can be used to represent circuits. • Know that bulbs get brighter if more cells are added.	electricity circuit light bulb cell wire buzzer switch motor battery series circuit conductor insulator break circuit diagram

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Topic: Hunted-Living Things and Their Habitats **Subject:** Science	**Prior Knowledge/Links:** Wind in the Willows-Living things and their habitats (Y1/2) Amazon Adventure– Living things and their habitats (Y5/6) Super Sleuth – Living things and their habitats (Y5/6) **Children should already know:** • the differences between things that are living, dead and things that have never been alive. • 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. • the names of a variety of plants and animals in their habitats, including microhabitats. • 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.	
National Curriculum Objectives	**Key Knowledge and Vocabulary**	
Living things and their habitats (Y4) 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 the local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.	• Know that living things can be grouped in a variety of ways (animals, flowering and non-flowering plants) • Know how to use classification keys to help group, identify and name a variety of living things in the local and wider environment. • Know how to construct and interpret a variety of food chains. • Know the producer, predator and prey in a food chain. • Know that environments can change and that this can sometimes pose dangers to living things (population and development, litter, deforestation). • Know the positive human impacts on environments (nature reserves, ecologically planned parks, garden ponds). • Know how to use and make identification keys for plants and animals.	environment flowering/non-flowering ferns mosses grasses vertebrate animals invertebrate animals mammals/amphibians/reptiles fish/birds human impact litter deforestation population increase/decrease nature reserves protection conservation

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<table>
<tr><td>Topic: There's No Place Like Home-Light and Shadows (standalone science unit)

Subject: Science</td><td colspan="2">Prior Knowledge/Links:
A Ship Called Hope – Light (Y5/6)

Children should already know:
N/A</td></tr>
<tr><td>National Curriculum Objectives</td><td colspan="2">Key Knowledge and Vocabulary</td></tr>
<tr><td>Light (Y3)
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 a solid object.
Find patterns in the way that the size of shadows changes.</td><td>Know that we need light in order to see things.
Know that dark is the absence of light.
Know how light travels in straight lines
Know that light is reflected from surfaces.
Know what happens when light reflects off a mirror or other reflective surfaces.
Know that light from the sun can be dangerous.
Know that there are ways to protect our eyes.
Know that shadows are formed when light from a light source is blocked by a solid object.
Know the patterns in the way that the size of shadows can change.</td><td>light
dark
absence of light
reflect
shadows
opaque
mirror
reflective
surface</td></tr>
</table>

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Science

<table>
<tr><td>Topic: The Great Plague- Sound (standalone science unit)

Subject: Science</td><td colspan="2">Prior Knowledge/Links:
n/a

Children should already know:</td></tr>
<tr><td>National Curriculum Objectives</td><td colspan="2">Key Knowledge and Vocabulary</td></tr>
<tr><td>Sound (Y4)
Identify how sounds are made, associating some of them with something vibrating.
Recognise that vibration 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 vibration that produced it.
Recognise that sounds get fainter as the distance from the sound increases.</td><td>• Know how sounds are made, associating them with something vibrating.
• Know that vibrations from sounds travel through a medium to the ear.
• Know that sounds are heard when they enter our ears.
• Know the patterns between the volume of a sound and the strength of the vibrations that produced it.
• Know that sounds get fainter as the distance from the sound increase.
• Know that sounds can be made in a variety of ways (pluck, bang, shake, blow).
• Know that sounds can be made using a variety of things (instruments, everyday materials, body).
• Know that sounds travel away from their source in all directions.
• Know that vibrations may not always be visible to the naked eye.
• Know that sounds can be high or low pitched.
• Know that the pitch of a sound can be altered by changing the material, tensions, thickness or length of vibrating objects.
• Know that sound travels through solids, liquids and air/gas by making the materials vibrate.
• Know that sound travel can be reduced by changing the material that the vibrations travel through.
• Know that sound travel can be blocked.</td><td>sound
vibrate
vibration
pitch
volume
insulation
travel
sound waves
distortion</td></tr>
</table>

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Science

Topic: Passport to Europe- Skeletons (standalone science unit) **Subject:** Science	**Prior Knowledge/Links:** Animals- Animals, including humans (Y1/2) Robots- Animals, including humans (Y1/2) Fighting Fit- Animals, including humans (Y1/2) Faster, Higher, Stronger – Animals including humans (Y5/6) Heroes and Villains- Animals, including humans (Y5/6) **Children should already know:** • the names of a variety of common animals including fish, amphibians, reptiles, birds and mammals. • the names of a variety of common animals that are carnivores, herbivores and omnivores. • the structure of a variety of common animals (fish amphibians, reptiles, birds and mammals including pets). • the names of the basic parts of the human body and say which part of the body is associated with each sense.	
National Curriculum Objectives	**Key Knowledge and Vocabulary**	
Animals including humans (Y3) Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	• Know that humans and some other animals have skeletons and muscles for support, protection and movement. • Know that vertebrates have a skeleton which supports their body, aids movement and protects vital organs. • Know that invertebrates do not have skeletons/backbones. • Know how invertebrates have adapted other ways to support themselves, move and protect their vital organs. • Know how the skeletons of birds, mammals, fish, amphibians or reptiles are similar (backbone, ribs, skull, bones used for movement) and the differences in their skeletons. • Know that muscles, which are attached to the skeleton, help animals move parts of their body. • Know how humans grow bigger as they reach maturity by making comparisons linked to body proportions and skeleton growth. • Know that animals are alive; they move feed, grow, use their sense and reproduce.	vertebrate invertebrate mammals/amphibians/reptiles fish/birds human impact reproduction alive/living dead movement reproduction respiration nutrition excretion growth senses skeleton exoskeleton muscles backbone