Sacred Heart Catholic Primary School

Science Overview

2022-2023

Pre-assessment- to be completed at the beginning of each new unit for KS1 and KS2

Suggested Science teaching activities

Cross-curricular links for KS1 and KS2

Suggested Topic links

Suggested Maths links

Suggested English links *including texts.*

EYFS to be added

Autumn		Spring		Summer	
Key Stage 1 – Year 1					
Animals including humans (senses and human body) • *What if we couldn't smell things? Explorify* ***Suggested trip: Crick Institute- senses workshop***	Plants - Link to seasonal changes • *Studying the structure of different plants. . Use a microscope to observe the features of each part. Complete observational sketches.* • *Make cress heads to observe plant growth* • *Planting seasonal vegetables to harvest in Spring*	Materials • *Linking to weather by designing raincoats and wellies.* • *Which of these objects are made from wood/plastic/glass?*	Plants- link to seasonal changes ***Suggested trip: Gillespie Park*** • *Harvesting Autumn planting.* • *Using fruit seeds to plant.* • *Comparison of leaves to those observed in winter.* • *'Plant bashing' art- PLAN Assessment*	Animals including humans (classification of animals) ***Suggested trip: Kentish Town Park Farm / London Zoo*** • *Similarities and differences between animals linking in location.*	Materials – create a project for the Great Science Share in June ***The Great Science Share- June*** • *What materials would make an effective shelter?* • *Give children a specific product to create and children choose suitable materials.*
• Matching activity. Provide blank outlines of the human body. Can children match corresponding parts/ labels. Encourage links to senses. Complete also for structural features	• Scavenger sort. Encourage pupils to sub-divide groups if possible, e.g. "*Round Leaves*" and "*Jagged Leaves*". Or use a Venn Diagram and	• TAPs focused assessment material for EYFS- Materials- Frozen Balloons	• Exporify- Odd One Out- Evergreen	• Sorting activity using plastic animals. What animals can the children name? What similarities and differences can they tell you? How would they sort these	• Explorify 'What if…' questions e.g. what is every material was stretchy? • Scavenger sort. Sort materials into groups using a

of an animal. • Classification activity.	identify objects which match 2 criteria. • Sort different objects by setting own criteria, e.g., fruit, food, flower etc.			animals into groups?	Venn Diagram. Some children may sort into their own groups.
	Planting in outdoor areas ready for Spring 2 Topic (plant late October/November). Link to how plants are good for the environment- Sacred Heart Eco promise.		Link to study of Wangari Maathai.	Look at animals in our local area. Complete a nature walk or visit a local farm/zoo.	Link with the GSS.
- Sorting - Make an animal out of a tangram - Time (exercise experiments)	- Counting (species - Measures (plant growth))	- Measures (weight e.g. heavier and lighter) - Sorting	- Counting (species - Measures (plant growth))	- Sorting - Make an animal out of a tangram	- Measures (weight e.g. heavier and lighter) - Sorting
'The Gruffalo'. How could we classify the animals in the story? How could we classify the Gruffalo?	'Dear Greenpeace' by Simon James.		'A Seed Is Sleepy' by Dianna Aston. What do plants need to grow well? How can they stay healthy?	'Pig the Pug and How to be a Dog' by Aaron What animals can we identify in the story? Study of their structures. Are they carnivores, herbivores or omnivores?	'Iggy Peck, Architect' by Andrea Beaty What materials are buildings made from? Using materials based upon their properties for architecture/ enterprise topic.

Seasonal Change

This unit should be visited throughout the year.

Link to Materials- find trees and take photographs throughout year comparing what the children wear in each image as well as how the leaves and weather have changed.

Explorify- Seasons. What's going on?

- Months of the year
- Time (length of days)

- Roving reporters in the field report back on the signs that the season is changing in the school grounds.
- A deciduous and an evergreen plant are interviewed about what is happening to them as the seasons change.

Autumn		Spring		Summer
Key Stage 1 – Year 2				
Animals including humans • *Mission on Mars: Children given cards of items on it and have to classify and sort into 'things that make me happy' vs 'things I need to survive'.* • *Design a creature to survive on Mars- Explorify* • *In small groups children sort different foods into food groups. Children then use paper plates and clay to design a balance meal (or create using real food).* • *Create a plan for a human to survive living in a rainforest- Explorify.*	Plants- linking with seasonal changes • *Sorting seeds and bulbs- use to create observational sketches.* • *Comparison investigation exploring the needs of different plants e.g. light and water.*	Use of Everyday Materials • *Identify objects around the classroom and describe what material they are made from.* • *Use playdough to explore how solids can be flexible, rigid and stretchy.* • *Children set up a comparative test to test the most suitable materials to use on water and explain why.*	Living Things and their Habitats (link to next unit on plants) *RSPB Big Schools Bird Watch Gillespie Park for pond dipping* • *How many different species live in the local environment?* • *Classify living, dead and never been alive.* • *Research an animal's needs and create a diorama habitat suitable for this.*	Plants- linking with seasonal changes *Suggested trip: Explore local woodland / outdoor space such as Gallespie Nature Reserve* • *Children observe the life cycle of planted sunflower over 5 weeks. Then report via seesaw (podcast) what happened to their sunflower over time.*
• Explorify- baby animals. Odd one out. • Explorify- home for a baby bird. Odd one out.	• Explorify- Types of Leaves. Odd One Out.	• Explorify- Unusual houses. Odd one out. • Sorting activity using different materials.	• Classification activity using plastic animals. • TAPs Y1 assessment- 'Animal Classification'.	• Spotter chart- types of plants in the local environment
-		- Selecting materials to suit the purpose of an enterprise project.	Protection of different species and their habitats.	

		- Properties of materials used to build houses in the past compared to now. Build model houses and test properties.		
- Time (life cycles)	- Measures (plant growth) - Sorting	- Sorting		- Statistics (data collection using purple mash)
'The Pirates next door' by Johnny Duddle. Diet and hygiene for a pirate. What does a pirate need to survive at sea?	**Jim and the Beanstalk.** How fast do plants grow? Do all plants grow at the same speed? What affects the speed at which plants grow?	**'The Great Fire of London'** by Emma Adams & James Weston Lewis. **'Rosie Revere, Engineer' by Andrea Beaty.** Suitability of materials for different needs.	**'We are water protectors' by Carole Lindstrom.** Look at microhabitats found in water sources as well as animals that rely on water sources.	**'A Walk in London' by Salvatore Rubbino.** Exploring plants in the local area. Development of school outdoor space.
Children pretend to be a variety of popular snacks found in their lunchboxes and argue for their survival based on their nutritional content and how these nutrients help the body to be healthy, with the least healthy snack being fired.		- Imagine one particular material (e.g. metal, wood, plastic) has vanished off the face of the Earth! Create a newsflash sharing this information and highlighting all the ways life will be different now and suggesting possible alternative materials for different purposes (good links to current	- Become an estate agent (realtor) and sell a suitable habitat to a familiar or unfamiliar animal. To add an extra dimension, another child could take on the role of the animal and talk about whether each habitat they are shown meets their needs. - Write a set of	

		plastic problems).	instructions for pond dipping.	

Autumn	Spring	Summer		
Lower Key Stage 2 – Year 3				
Forces and Magnets *Suggested trip: Science Museum including Forces Workshop* • *Speed/distance of cars travelling down a ramp on different surfaces.* • *What different materials can skis be made from? E.g. nail files, plastic sticks, lollypop sticks.* • *Making compasses – Reach Out CPD*	**Plants** *Gillespie Park Nature Reserve* Scientist study: George Washington Carver • *Once every half term, go out to look for seeds, berries, fruits, buds and flowers.* • *Group findings using hoops to create Venn diagrams.* • *Disect plants to explore the following question: What are the functions of different parts of a plant?* • *How is water transported in plants? Add tulips or carnations to food colouring to explore this question.*	**Rocks** Scientist study: Mary Anning • *Sweet rocks:* *Trebor mints- chalk* *Boiled sweets- granite* *Fudge- Sandstone* *White chocolate – limestone* *Slate- slightly melted stack of large chocolate buttons* *Using a magnifying glass to observe different structure of rocks. Create a table of all the different properties.* • *Test properties of rocks- see Geological Society website.* • *How are fossils formed? PSTT activity* *Use chocolate to make different layers of soil.*	**Animals including Humans** • *Which is breakfast is best? Classify foods by nutritional value- Explorify.* • *Hook: Alien emails class wanting to visit, but is worried about the effects of Earth's gravity and therefore being a blob.* • *Explore skeletal structures for different purposes e.g. to be a fast and agile swimmer.* • *Make a model muscle.*	**Light** • *Use dark tents to explore how we can't see in the absence of light.* • *Enquiry questions: How can you make shadows longer/shorter? How can you make shadows move?* • *Explore materials that can be used to make sunglasses (link to protection from the sun).*
Pre-assessment using Explore, Engage, Extend				
		- Costal erosion and effects of pollution on rocks (rocks in vinegar experiment). - Link with Stone Age topic.	-	

	- Statistics (graphs and tables)	- Measures (make a working muscle)	- Weights	- Data loggers - Measures (shadow length and time) - Roman numerals (sundials)
	- ***The Tiny Seed—Eric Carle.*** *Do all seeds look the same? How can we sort them? How are seeds dispersed? What is the most effective shape for a seed that is dispersed by wind?*	- ***Pebble in my Pocket.*** *What clues can we see in our rocks of the journey they have been on? How can we group and sort our collection of rocks?* - ***Mary Anning and the Sea Dragon*** - ***Street Beneath Our Feet***	-	- ***The Game in the Dark—Herve Tullet.*** *How are shadows formed? How can we change the shape/size of shadows? Which materials would be best for a book like this that casts shadows?*
- Science experiment write up linking to friction investigations.	- Design a seed packet including instructions for plant growth. - Pupils create a documentary about the different plants that can be found in the school grounds.		- Children create a menu for a fancy restaurant then create an advert selling their meal and justifying the high price tag by explaining the healthy balance of nutrients.	- Children create a newsflash about a 'sneaky shadow' that has been caught moving around during the day, with a resident scientist on hand to explain why this is happening.

Autumn	Spring	Summer

Lower Key Stage 2- Year 4

Sound	Electricity	Living things	States of Matter	Animals including Humans
• *Using data loggers and trundle wheels to measure decibels at different distances (outdoors).* • *String phones to explore sound travelling by vibration (on playground).* • *Use instruments to explore pitch and sound.*	• *Building series circuits.* • *Use paper clips to build working switches.* • *Using different materials to build circuits e.g. tinfoil as wires (link to insulators and conductors).*	*Nancy Rothwell Award- sketching a specimen* *Gillespie Park Nature Reserve* Scientist study: Dr Sylvia Earl and/or David Attenborough • *How can deforestation affect animal habitats? Research enquiry question.* • *Play guess who using classification keys to identify different living things.* • *Use straws and post-it-notes to create classification keys.* • *Using plant/tree keys, explore the different species found in the local area.*	*Suggested trip: Chocolate Museum, Brixton.* Scientist study: Dr Maya Warren Ice Cream Chemistry – Research Champions (research-champions.com) • *Ice cream making (linking to scientist study).* • *Melting different types of chocolate and comparing.* • *Ice dragons- create an ice dragon/princess out of a plastic bottle and a ping-pong ball head with wool for hair. Design a jacket to stop them from melting from different materials. Track changes using thermometers.*	• *Use rope to show the actual scale of the digestive system.* • *Digestive system experiment with a sandwich using tights to represent the intestines (Eng link below).* • *Eggshells in water, vinegar and fruit juice linking to teeth.* • *Which toothpaste is most effective? Enquiry using egg shells.*

Pre-assessment using Explore, Engage, Extend

		- Study of habitats / micro-habitats native to Europe (especially our local area), including ocean habitats.	- Make a volcano so that carbon dioxide gas is produced.	
- Using data loggers to measure decibels at different distances (use trundle wheels). - Drawing bar charts to display data logger results.	- Using data loggers - Read the brightness of a bulb using data loggers from the circuits they have created.	- Statistics (population of species) - Co-ordinates (locating habitats on a map)	- Measures (temperature) - Time - Capacity (rain gage) - Drawing bar charts for different melting points.	
- *The Sound of Silence*		- ***Beetle Boy—M G Leonard.*** *How could we classify the small creatures living in our outdoor area? Could we create a classification key to help others identify them?*		
- Children investigate materials which absorb sound, then create and advertise a pair of ear muffs for construction workers.	- Science experiment write up.	- Create a documentary about the micro-habitats that can be found in their school grounds. - Children lead a newsflash about a discovery that a bat (or similarly confusing animal!) is not in fact	- Investigate and create an advertisement for a material to wrap around their morning cup of coffee to keep it warm for longer (target audience of teachers).	- Write in role as something that has been consumed by a human/animal describing your journey through the digestive system.

		a bird as many people think, but is in fact a mammal. A bat could also be interviewed and express their annoyance at always being confused for a bird.		

Autumn	Spring	Summer		
Upper Key Stage 2 - Year 5				
Forces Scientist study: Sir Isaac Newton • Create parachutes to explore air resistance and gravity (potential link to Space by creating parachute for Spacecraft). • Use force meters to measure gravity acting against different objects. • STEM project creating a device that uses levers and pulleys.	Earth and Space National Space Week 4th October Suggested trip: Immarsat Inight Day (located at Old Street) Scientist study: Dr Maggie Aderin Pocock (local Islington born astrophysicist) and Mae Jemison • Role play the movement of the planets relative to the Sun or build model Solar Systems. • Use a torch, globe and ball to explain day and night and apparent movement of the Sun. • Observe the phases of the Moon each morning from the playground.	Living Things and their Habitats Gillespie Park Nature Reserve • Gardening with Mr Watts (straweberries and potatoes work well) linking to the life cycle of different plants. • Arrange for chicks to allow Year 5 to observe the life cycle and keep diaries.	Materials Scientist study: Wu Chien Shiung • Link to Arizona Salt Flats. How were they created? Children create investigations to explore dissolving salt in water. • Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture. Use this knowledge to design a beach cleaning device. • Does hot chocolate have to be hot? Explorify.	Animals including Humans • Looking at animals around the world using webcams. • Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth. • Look for patterns between the size of an animal and its expected life span.
Pre-assessment using Explore, Engage, Extend				
	- Link with Black	- Focus upon species		

	History Month by studying Astronaught Mae Jemison.	found around/within water sources.		
- Measures (Newtons) - Statistics (data collection and graphs)	- Measures (creating scaled solar system) - Angles (turns) - Converting units of time - Statistics	- Statistics (date collection and graphs)	- Measures (temperature and capacity)	-Statistics
	- *Look Up* - *Mae Among the Stars*		- *Queen of Physics: How Wu Chien Shiung Helped Unlock the Secrets of the Atom*	
- Science experiment write up.	- Write in role as a sailor explaining how they know the earth isn't round (Active Assessment). - Children research and produce a documentary about one of the planets in our solar system.	- Different types of plants argue over which disperses their seeds most effectively or is the most important in plant reproduction. Create a class debate.	- Write a newspaper report about a substance that has 'vanished' (see Active Assessment 'Vanishing Sugar'). - Investigate and sell (persuasive advertisement) a material suitable for an astronaut's visor (links to the Royal Society of Chemistry's 'Mission Starlight' activities).	

Autumn	Spring	Summer

Upper Key Stage 2 – Year 6

Living Things and their Habitats	Electricity	Animals including Humans	Evolution and Inheritance	Light
Scientist study: **Dr Xiaogang Qu** Bacteria-banishing bandages – Research Champions (research-champions.com) • *To understand different structures of micro-organisms make playdough micro-organisms.* • *Sneezing into hand with green paint- touch to see how things spread.* • *Investigation exploring the best conditions for mold growth using agar jelly in petri dishes. Use microscopes to observe.*	• *What is the best way to light three bulbs? Exploring parallel and series circuits. Use data loggers to measure emitted light.* • *How can we make a bulb brighter?* *Or* *How can we make the volume of a buzzer louder? Enquiry exploring voltage and components.* • *Create a product using parallel circuits e.g. a light up Christmas tree card.*	**Scientist study:** **Marie M Daly** • *Explore the effects of exercise on our heart rates using data loggers to measure heart rate.* • *Use blue and red hoola hoops on the floor for children to map out the pathway of oxygenated and deoxygenated blood in the heart.* • *Disection of a lamb's heart to explore chambers and arteries.*	***Suggested trip: Natural History Museum including fossil workshop*** ***The Crick- Cancer Research*** **Scientist study:** **Rosalind Franklin** **Charles Darwin** • *Watch Fat Boy Slim Right Here Right Now.* *See counter clock in corner* • *Give children images of parts of fossil e.g. a head and a tail. What does the rest of fossil look like?* • *Camouflage worms: Bits of wool in different colours, some which match the floor, cut to worm length. Give the children tweezers and a set time to collect as many worms as possible from the floor.* *Peppered moth- genetic advantage of being darker for survival. Research*	• *Is it possible to see around corners? Use this enquiry question to lead into building periscopes.* • *Creating shadow puppets (online workshop with Little Angel Theatre).* *Use to investigate the following enquiry:* *How does the distance between a light source, an object and a screen affect the shadow?*

			opportunity.	
Pre-assessment using Explore, Engage, Extend				
- Conditions for bacteria growth in the trenches and infestations soldiers suffered.	- Use solar powered circuits and build wind turbines (in Science cupboard) to explore renewable sources.		- Look at how global changes have impacted upon adaptation and evolution of different species.	- Use of sundials in ancient Greece.
- Statistics	- Mean voltage - Negative numbers	- Time and statistics (line graphs) through exercise experiments - Mean measurement	- Statistics (populations of species) -	- Using data loggers to create graphs and explore percentages
- *Big Book of Blooms*			- *Moth- Isabel Thomas. What coloured moths would be best camouflaged in our school environment?* ***Charles Darwin's on the Origin of Species***	-
- Writing a travel agent advertisement for a living thing (e.g. bacteria) considering the conditions needed for growth.	- Children research, design and create an eco-friendly version of an existing product (e.g. solar panelled Christmas toy) before creating an advertisement.	- The different parts of the circulatory system explain why they couldn't possibly be fired from the system.	- An insect has just undergone metamorphosis- create a newsflash about this startling change.	- Science experiment write up.