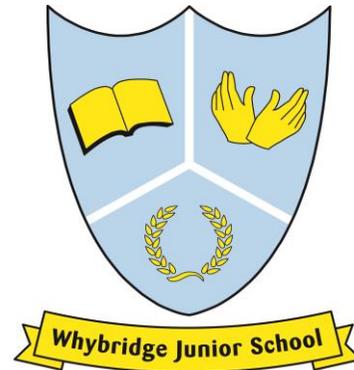


Whybridge Junior School



Science

New Curriculum 2014: Planning Document

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The new primary curriculum for Science: What has changed?

Working Scientifically now includes different types of enquiry observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. It is divided into three phases not 6 year groups.

Content – major headlines

- No electricity, light and sound or forces and movement in KS1
- Seasonal change in Y1
- More on naming and identifying things (especially in KS1)
- Evolution and inheritance in Y6

Opportunities within the new curriculum

- More learning outside
- More types of science enquiry
- More room in the curriculum for learning to be deepened

And what about assessment?

- Levels removed
- Schools to use their own approaches to assessment
- Assessment framework should check what pupils have learned and whether they are on track to meet expectations at the end of the key stage, and to report regularly to parents
- DfE to provide examples of good practice

Cross-curricular links

Science is linked to numerous core curriculum areas for example:

- Wordsmith (an English planning scheme used by the school)
- Bug Club (a Reading scheme used by the school).
- Abacus (a maths scheme used by the school)

Science is also linked to Humanities SOW; this is supported by the Royal Society of Chemistry (Learn Chemistry) curriculum maps. Found at: <http://www.rsc.org/learn-chemistry/resource/listing?searchtext=%22Primary+collection%3A+science+ideas+webs%22&eMediaType=MED0000009>



LONG TERM PLANNING

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science **SUBJECT LEADER:** Terri Pettican **YEAR GROUP:** Year 3

TERM 1		TERM 2		TERM 3
Statutory: Animals Inc. humans (moving and feeding) <ul style="list-style-type: none"> • Nutrition, linked to what we eat • Skeletons and muscles 	Statutory: Rocks (and soils) <ul style="list-style-type: none"> • How rocks are formed • Different kinds of rocks • Fossils Non statutory: <ul style="list-style-type: none"> • Soils 	Statutory: Forces (magnets and forces) <ul style="list-style-type: none"> • How magnets attract some materials • Floating and sinking Non statutory: <ul style="list-style-type: none"> • How things move on different surfaces 	Statutory: Light (and shadows) <ul style="list-style-type: none"> • Sources Inc. the Sun and electricity • Shadows • Reflection • Vocab: e.g. translucent 	Statutory: Plants (what plants need) (parts of plants) <ul style="list-style-type: none"> • Function of different parts of a plant • What different plants need to flourish • Journey of the food in a plant • Life cycle of a plant



LONG TERM PLANNING

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science **SUBJECT LEADER:** Terri Pettican **YEAR GROUP:** Year 4

TERM 1		TERM 2		TERM 3
Statutory: Sound <ul style="list-style-type: none"> • Sources • Vibration • Loud and faint • Pitch • Volume 	Statutory: Electricity <ul style="list-style-type: none"> • Alternative sources of energy 	Statutory: Animals including humans (human nutrition) <ul style="list-style-type: none"> • The digestive system materials • Teeth 	Statutory: States of matter (changes of state) <ul style="list-style-type: none"> • Solids, liquids and gases • Heating a cooling • Evaporation and condensation 	Statutory: All living things (Dangers to living things) (Grouping living things) <ul style="list-style-type: none"> • Identify and name a variety of living things (plants and animals) in the local and wider environment • Recognise that environments can change and can pose dangers



LONG TERM PLANNING

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEARGROUP: Year 5

TERM 1		TERM 2		TERM 3
<p>Statutory: Properties and changes of materials (separating mixtures)(types of change)(materials)00</p> <ul style="list-style-type: none"> • Dissolving • Evaporating • Filtering • Reversible and irreversible changes • Properties of materials 	<p>Statutory: Forces</p> <ul style="list-style-type: none"> • Gravity • Air resistance • Water resistance • Friction • Gears, Pulleys, Leavers and Springs 	<p>Statutory: All living things (life cycles)</p> <ul style="list-style-type: none"> • Life cycle of plants and animals <p>Birth, growth, development and reproduction</p> <p>Statutory: Animals Inc. humans</p> <ul style="list-style-type: none"> • Changes as humans develop from birth to old age 	<p>Statutory: Earth, Space and Magnetism</p> <ul style="list-style-type: none"> • Earth relative to the Sun • Moon relative to the Earth • Relationship between the Sun, Earth and Moon • Earth's rotation • Day and Night 	<p>Statutory: Properties and changes of materials (separating mixtures)(types of change)(materials)</p> <ul style="list-style-type: none"> • Dissolving • Evaporating • Filtering • Reversible and irreversible changes • Properties of materials



LONG TERM PLANNING

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science **SUBJECT LEADER:** Terri Pettican **YEAR GROUP:** Year 6

TERM 1		TERM 2		TERM 3
Statutory: All living things (classifying living things) <ul style="list-style-type: none"> • Classification of living things • Vertebrates and invertebrates • Classifying reptiles, amphibians, mammals, insects, etc. 	Statutory: Animals incl. humans (our bodies) <ul style="list-style-type: none"> • Circulatory system • Heart, blood vessels • Diet, exercise and drugs • Transport of nutrients through the body 	Statutory: Light(and sight) <ul style="list-style-type: none"> • How light travels • The eye • Shadows 	Statutory: Electricity (changing circuits) <ul style="list-style-type: none"> • Electrical circuits (series) • Designing traffic lights 	Statutory: Evolution and Inheritance <ul style="list-style-type: none"> • Fossils tell us about the past • Off spring • Changes to the human skeleton over time • Darwin



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science **SUBJECT LEADER:** Terri Pettican **YEARGROUP:** Year 3 Term 1

AUTUMN TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions 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 and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Using straightforward scientific evidence to answer questions or to support their findings.
	1	Two	Animals (inc. humans)	Children discuss and vote on a series of statements. They talk about the different types of food needed in a healthy diet and the teacher explains that scientists advise the government on what is the best balance of food but not all scientists agree. In groups, children are given two whole paper plates cut into thirds. On the thirds, they put examples of different food types using reference materials. They use the completed drawings to play a beetle-drive game. Children demonstrate their learning by grouping food images and explaining their choice.
	2	Two	Animals (inc. humans)	Children research the diet of an animal of their choice and share their facts with the rest of the class. The teacher captures their facts in a class book on animal diets. Children discuss and make a list of food that is poisonous to animals and talk about how animal charities can tell when animals are underfed or overfed.
3	Two	Animals (inc. humans)	Children learn about how eating too much or too little can be bad for your health. After watching a deliberately mundane video about healthy eating, children create a more interesting presentation about what happens if you eat unhealthily. Children learn about diets through history, looking specifically at how diets have changed and how scientists are always finding out new things about	

				healthy diets which can change our understanding of 'facts'.
	4	Two	Animals (inc. humans)	Children learn about the human skeleton and make up a new version of 'Head, shoulders, knees and toes' using bones. Use a baby-grow filled with beans to imitate a body without a skeleton and ask children to think of ways to make the baby-grow stand up. Children look at x-rays of human bones and research and describe a bone to the class. In groups, children make the tallest upright figure they can, using marshmallows, water and sticks. Children discuss the results and why the cocktail sticks made it easier. They then learn about muscles and how they work with bones to help animals move.
	5	Two	Animals (inc. humans)	Children compare the sizes of their hands to find whether the child with the biggest hand can grab the most sweets. They look at the results of another sweetie grab investigation and try to spot some of the mistakes in it. Children discuss the likely relationship between body parts (e.g. age and height) and think about the ability to perform a task in relation to different dimensions of body parts. The class chooses one question to investigate about body part and ability and carry out a pattern-seeking investigation.
	6	One + Assessment tool kit	Animals (inc. humans)	Produce a table of results from the sweetie grab investigation from lesson 5 and model creating a large scatter graph. Question children about the graph and discuss the pattern of larger hands grabbing more sweets. Children draw the scales for their own scatter graphs about body part patterns and draw the points on their graphs. They write next to their graphs patterns that they've identified and share and discuss results with as a class.

AUTUMN TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
	1	Two	Rocks	<ul style="list-style-type: none"> 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. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Setting up simple practical enquiries, comparative and fair tests
				Children write down what they know about how rocks and soils are formed and discuss which rocks they can name. The teacher plays a game of 'twenty questions' with the class with chocolate samples ('chocolate rocks'). Children

				then sort real rock samples into groups and create their own selection criteria. They start their own scrapbooks which they will update throughout the unit.
	2	Two	Rocks	Children discuss the specific properties of the rocks before handling and comparing marble and chalk samples, thinking about how they would test for hardness. Children look at the Mohs scale and devise a test for hardness. They arrange their rocks from hardest to softest and make a testing and results template. They discuss how reliable the results are and add the investigation to their scrap books.
	3	Two	Rocks	Children look back at their ideas from Lesson 1 and think about how rocks are formed. They examine samples of igneous and metamorphic rock, recording their learning in their scrapbooks. They then learn about how fossils are formed.
	4	Two	Rocks	Children read facts about fossils, learning the word 'palaeontologist', and discuss where to look for fossils and what tools you would use. Children make their own 'fake fossil' out of modelling dough and Plaster of Paris before investigating animal skeletons. In groups, children assemble bone-shaped dog biscuits into a fossil creature. They repeat this on a larger scale outside, making a fossilised dinosaur in their groups on large sheets of paper.
	5	Two	Rocks	Children make a list of things they know about soil and where it comes from. They go into the school grounds to look at soil, using their own soil examination kits. Children then test a harder and softer rock and compare to the different types of soil, learning that soil is made from rock and plant particles.
	6	One + Assessment toolkit	Rocks	Children recap what they have learned about the parts that make up soil and look at a demonstration of sugar cubes being broken down to represent rock erosion. Children are reminded about the importance of worms in soil production and they record their learning by making a 'recipe for soil' to document how it is made over time.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEARGROUP: Year 3 Term 2

SPRING TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • 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 • Making systematic and careful observations and, 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 • Setting up simple practical enquiries, comparative and fair tests • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Using straightforward scientific evidence to answer questions or to support their findings. • Identifying differences, similarities or changes related to simple scientific ideas and processes • Asking relevant questions and using different types of scientific enquiries to answer them
	1	Two	Forces	Children explore how toys can move and learn that a force is any push or pull that makes something move. They discuss a video of a child being pushed on a swing and learn that the speed and distance of the swing's movement are directly affected by the contact made by pushing it. Children carry out an investigation to explore how catapults can move toy cars.
	2	Two	Forces	In groups, children play a game of bowls on the playground where the surface is smooth and then another game on grass. They record their results and decide the best surface for playing bowls. Children design a table top game of bowls, using different sized coins and different surfaces. They carry out a series of comparative tests and present their findings to the rest of the class.
3	Two	Forces	Children explore magnets and identify three facts about them to share with the class. Groups are given bowls of	

				water with plastic dishes floating on them and try to move them, exploring the effects of forces. Children use magnets to move the dish without direct contact and share their results. They are introduced to the terms 'repel' and 'attract' and think about how magnetic forces are different from push and pull forces.
	4	Two	Forces	Children learn that magnets can attract other materials and predict whether random materials are magnetic or not and record predictions in a tally chart. They then test their predictions, record the results and discuss observations as a class. Children are given a selection of 1p and 2p coins pre-1992 and post-1992 and identify which are magnetic.
	5	Two	Forces	Children observe a 'floating' paperclip and predict and test what will happen if they place different objects between the magnet and paperclip. Children test whether a magnetic force can travel through different materials and record their ideas and observations. They then test the strength of different magnets.
	6	One + Assessment toolkit	Forces	Children read about how magnets were discovered and used before discussing how and why we use magnets in our daily lives. Children discuss tools which can be used to pick up magnetic materials and, in pairs, discuss possible tools and their applications. Groups make a plan and construct their designs.

SPRING TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to: <ul style="list-style-type: none"> • 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 shadows are formed when the light from a light source is blocked by a solid object • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Find patterns in the way that the size of shadows change. • Setting up simple practical enquiries, comparative and fair tests • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
	1	Two	Light	Children are introduced to concept words about light and shadows. They discuss and list light sources and consider

				whether items are sources of light or reflectors. Create a dark den for children to experience darkness and to see how well they can see shiny objects in the dark and also with torches. Make a black box shoebox and get children to look at objects inside to reinforce the idea that we cannot see without light. Play a mirror relay when the room has been darkened, bouncing light from one mirror to the next.
	2	Two	Light	Recap what 'source' and 'reflector' mean. Children learn that light travels in straight lines and that when light is blocked, a shadow is formed. They explore shadow formation using lights (e.g. torches) and different objects before making a silhouette gallery. They complete an activity, matching objects with their shadows.
	3	Two	Light	Children discuss what a 'good' shadow looks like and are given a range of materials of different degrees of opacity and torches to explore what happens when they try to make shadows. Introduce the terms 'opaque', 'transparent' and 'translucent'.
	4	Two	Light	This is an activity for a sunny day. Children draw pictures of how they think their shadows would look outside on a sunny day. Children read about, discuss and create a display board about sun safety before taking photographs of shadows outside and the objects that cast them. Outside, children draw around each other's shadows early on in the day and then again later in the day. Children discuss how and why their shadows have changed.
	5	Two	Light	Children work on producing a shadow puppet play to a Reception class. They consider what materials might make the best puppet before making a test shadow puppet. Set up equipment for children to test how they can change the shapes of the shadows created by the puppets. Let them draw around the shadows made, marking the distance from the wall and discussing the relationship between distance and size of shadow.
	6	One and assessment toolkit	Light	Children plan how to narrate a story or nursery rhyme for their shadow puppet plays and they present these to a Reception class. Children describe and explain the scientific principles behind their shadow puppetry.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science **SUBJECT LEADER:** Terri Pettican **YEARGROUP:** Year 3 Term 3

SUMMER TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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 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 Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers 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 Setting up simple practical enquiries, comparative and fair tests Using straightforward scientific evidence to answer questions or to support their findings. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
	1	Two	Plants What plants needs	Children discuss what plants need in order to grow and, as a knowledge capture activity, draw a picture of the best place to grow a plant. Children explore the school grounds in groups and find places where plants are struggling to grow and others where they are flourishing. They take notes and photos and make a list of the places where they didn't grow well.
	2	Two	Plants	Children investigate what happens to a plant when it isn't watered and create an illustrated timeline using to show what they think will happen when it is watered. They then gather data over a week to see how much water a plant needs by giving plants different amounts of water and comparing them against a control plant which is not watered at all.
3	Two	Plants	In pairs, children discuss how to help root bound plants grow. They plan and carry out investigations to find out how much grass seed is needed to grow the perfect patch of grass.	

	4	Two	Plants	Children consider whether plants need soil to grow. They compare and describe different planting materials and learn that different soils provide different nutrients. Groups plan and carry out a test to find out which soil is best for growing radishes. Each group creates a poster to promote the benefits of using a specific soil for radishes.
	5	Two	Plants	Children look at their work from Lesson 4 and observe their results. They try to see if they can improve plant growth by adding fertiliser and explore different fertiliser labels to look for similarities and differences in ingredients. Children investigate; using fertiliser pellets, which quantity of fertiliser makes plants grow best. They decide how many pellets to add to each pot and use a control plant to improve the investigation.
	6	One + Assessment toolkit	Plants	Children harvest the radishes they planted in Lesson 5 and make detailed observations about their growth. They annotate their drawings from Lesson 1, including details of how to make a plant grow better. Using their knowledge of what plants need, children grow a mystery plant. They make daily observations and measure and record how they grow when the plants begin to emerge.
SCIENCE WEEK linked to the National Science and Engineering website				

SUMMER TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
	1	Two	Plants Parts of a plant	<ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • 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. • Asking relevant questions and using different types of scientific enquiries to answer them • Making systematic and careful observations and, 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 • Using straightforward scientific evidence to answer questions or to support their findings.
				Children draw and label a plant, explaining what each part does to help it live and grow. The different drawings are discussed and kept for future reference. A list of commonly named plant parts is made and children cover the common parts of plants again. Children play a 'taboo' game and revisit naming and describing the parts of a flowering plant.

	2	Two	Plants	Children think about the differences between plants and their different parts. Outside, children observe a dandelion in the ground and learn how the roots act as anchors. They discuss how plants need water and how the roots absorb water and nutrients. Children carry out an investigation using food colouring in water to see how the stem moves the water to different areas of the plant. They carry out this same process on a celery stick and note the differences.
	3	Two	Plants	Children collect different types of leaves from outside and compare them with other leaves that you may find in a grocery. They take wax rubbings of leaves which have prominent veins. Children learn how plants make their own food using photosynthesis and recap their experiment with food colouring, to see where the water in a plant travelled. Finally, they make a terrarium and observe how the plant recycles water over time.
	4	Two	Plants	Children learn the importance of a flower within a plant and, in groups; look at the reproductive parts of an open flower. They dissect the flower and use it to create a display. Children then learn about pollination and think about the sequence of insect pollination.
	5	Two	Plants	Children draw a sequence to show the life cycle of a flowering plant. They learn about different types of seed dispersal and make models to show this.
	6	One + assessment toolkit	Plants	Children check their bulbs from Lesson 2 and, in groups, play a 'bingo' type game to consolidate learning. They review their labelled plant drawings from Lesson 1 and redraw a version of their picture with annotations, adding all the detail they now know. Children compose songs to explain the functions of a plant part and perform to the class.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEARGROUP: Year 4 Term 1

AUTUMN TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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. • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Setting up simple practical enquiries, comparative and fair tests • Identifying differences, similarities or changes related to simple scientific ideas and processes
	1	Two	Sound	Children watch an introductory video about sound and play a sound bingo game, matching sounds with images. Sound stations are placed around the room where children can make sounds and watch objects vibrating. They visit each station, record their observations and discuss what sounds have in common.
	2	Two	Sound	Children investigate what happens when a piece of paper is placed between the tines of a vibrating tuning fork. They learn how sound travels through the ear to the brain. Selected children are labelled as different parts of the ear and arranged to demonstrate how sound travels through the ear. Children record their knowledge of how we hear sound and explore how sound travels through solids, liquids and gases using a variety of materials.
	3	Two	Sound	Children explore ways of changing sounds through a variety of instruments by changing the pitch of a sound on drums and stringed instruments. In groups, children discuss the relationship between pitch and the features of the object producing the sound. Children test their ideas on a stringed instrument and rubber bands stretched over a plastic food box.
4	Two	Sound	Children further explore the relationship between pitch and vibration frequency by making shrieking balloons. They also test changing sounds on a straw oboe and by making a bottle orchestra. They investigate changing pitch by adding water to their bottles before blowing across the tops. Children make a diagram of the vibrations taking place inside the bottle.	

	5	Two	Sound	Children explore how to measure the volume of sounds by learning about decibels. Children use data loggers to measure the volume of their voices and a variety of instruments. They are then placed in groups and asked to use data loggers to make a sound map by recording sounds in different areas of the school.
	6	One + assessment toolkit	Sound	In groups, children design an experiment to measure how far away sounds can be heard. Children collect measurements and discuss their results as a class. Using their knowledge of sound, children create a sound track for a film. They watch a Foley video and discuss sounds that would match what is happening in the film. Children create their own sound effects and perform for the class.

AUTUMN TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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 some common conductors and insulators, and associate metals with being good conductors. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Using straightforward scientific evidence to answer questions or to support their findings. • Asking relevant questions and using different types of scientific enquiries to answer them • Identifying differences, similarities or changes related to simple scientific ideas and processes
	1	Two	Electricity	As a knowledge capture activity, children complete an electricity concept map. They then try to identify an electrical appliance for every letter of the alphabet before sorting these into ones that use mains electricity, batteries and those that use both. Children design a new electrical appliance that would make life easier.
	2	Two	Electricity	Children construct a simple circuit using components including wires, bulbs, buzzers, switches and batteries. In pairs, children make a bulb light up and a buzzer buzz and they keep a record of their working circuits using photographs, drawings or models and they label the different components. Children are introduced to switches.

	3	Two	Electricity	Children look at images of different circuits and predict whether the bulb will light in each one. Groups are given a box of components to check their predictions by building circuits. The teacher makes electricity puzzle spiders and children try putting the spider into their circuit to see which legs are cut in the middle without pulling the wires out.
	4	Two	Electricity	Children construct a circuit which lights up a bulb and they test spoons of different sizes and materials in the circuit, looking for ones which insulate and conduct electricity. They make a group record of their results, coming to general conclusions as a class about the material of the spoon. They predict and test other objects of different materials to see which conduct electricity and record their results.
	5	Two	Electricity	In groups, children use a sample of materials to answer questions relating to materials and electrical conductivity and insulation. They ask their own questions to aid the investigations and each group chooses a question to answer themselves.
	6	One + Assessment toolkit	Electricity	Children explore a variety of different switches. They construct circuits using buzzers and bulbs and insert switches into their own circuits and describe what happens. As a class, they discuss what makes a good switch and then pairs are given a selection of recycled materials to design and test their own switch. They add knowledge they have gained to their concept maps from lesson 1.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science **SUBJECT LEADER:** Terri Pettican **YEARGROUP:** Year 4 Term 2

SPRING TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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 • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • 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
	1	Two	Animals including humans Human Nutrition	Children discuss their knowledge about food and digestion and predict what happens inside their bodies when they eat. They draw and label their predictions on a body map and recreate a diagram of the human digestive system. The finished drawings are shared and a glossary of organ names is created for future reference.
	2	Two	Animals including humans	Children play a 'Ready, Steady, Digest!' game in pairs to demonstrate how a banana sandwich passes through the digestive system. They use a variety of materials to illustrate what happens as it goes from our mouths to our stomachs to the intestine. They then create a flow chart to record the sequence of digestion.
	3	Two	Animals including humans	Children play a 'taboo' type game to recap names and functions of the organs in the digestive process. They make models of their own teeth from modelling clay and discuss different types of teeth and their functions. They consider how animal diets are related to the shape of an animal's teeth and play dental detectives, identifying animals by the dentition of their skulls.
4	Two	Animals including	Children briefly discuss their experiences with dentists and the different effects food and drink have on teeth. In groups, children plan to investigate how different drinks affect our teeth. Children test their ideas by immersing eggshells in various liquids, identifying variables and recording results over time with words and pictures.	

			humans	
	5	Two	Animals including humans	Children review the progress of their eggshell investigation. Their photos are placed in chronological order to compare before and after results. In groups, children create a poster flow chart of how tooth decay happens based on their own investigations as well as research from the internet and reference materials.
	6	One + Assessment toolkit	Animals including humans	Children revisit their eggshell activity results and discuss how tooth decay can be avoided. In groups, children compare three different toothpastes through a variety of tests. They design the packaging for their ideal toothpaste before revisiting the digestive system. Children review their drawings on their body maps from Lesson 1 and make adjustments based on their learning.

SPRING TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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. • Identifying differences, similarities or changes related to simple scientific ideas and processes • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
	1	Two	States of matter	Children use their own criteria to sort a selection of materials. They make a list of the ways solids and liquids differ from each other and are introduced to the term 'properties'. Groups are given some sultanas and lemonade and asked to identify and justify them as a solid and liquid. They predict and observe what happens when the sultanas are put in the lemonade. Children then look at an inflated party balloon and discuss that air is made up of gasses.
2	Two	States of	Children learn that all materials are made up of particles which are arranged in different ways and look at the	

			matter	structure of particles in a solid, liquid and gas. They learn about the effect temperature has on different materials and how it can change their properties. They think about 'melting' and 'freezing' and relate to different food. Children mime being solid particles which are heated to become liquid, liquid to gas and vice versa. Children apply their knowledge on changing states to making chocolate crispy cakes.
	3	Two	States of matter	Children recap that water can exist in all three states of matter and can change easily. They discuss the best methods for melting and carry out activities involving measuring and reading temperature. Children record the changes of state in water and think about the different temperatures where changes take place.
	4	Two	States of matter	Children predict what they think a selection of things may look like when frozen. They observe frozen substances and watch how they behave as they return to room temperature. Children investigate the effects of heating and freezing on a selection of materials. They predict what will happen and establish the temperature of the room, fridge and freezer and then carry out the investigations.
	5	Two	States of matter	Children draw predictions of what will happen to a wet towel when it is hung on a washing line. They observe the vapour leaving the surface of hot water and observe the water film left on the glass when the hot water is left next to a cold window. The same test is carried out on the window using the wet towel and a dry one. The term evaporation is introduced and children carry out a test to observe this, noting the influence of temperature. Children are introduced to the idea of condensation and how this is the opposite of evaporation.
	6	One + assessment toolkit	States of matter	Children recap the processes of evaporation and condensation and are introduced to the cyclical process of the water cycle. Children make up actions for evaporation and condensation and the different parts of the cycle. They make a model of part of the water cycle using plastic bottles and ice. In their groups, children record their knowledge of the water cycle and the associated changes of state in a poster or some other creative form.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEARGROUP: Year 4 Term 3

SUMMER TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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. • Asking relevant questions and using different types of scientific enquiries to answer them • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Setting up simple practical enquiries, comparative and fair tests • Using straightforward scientific evidence to answer questions or to support their findings.
	1	Two	All living things Dangers to living things	Children sort statements about food chains under 'True', 'False' and 'Not sure'. They turn conflicting statements into questions to research. Children consider the impact of environmental change on living things, thinking specifically about the availability of food as an important factor when considering how animals respond to environmental change.
	2	Two	All living things	Children research two food chains; one about living things in the UK and one in another part of the world. They create and display their food chains and look at similarities. They think about why plants are the start of all food chains.
	3	Two	All living things	Children draw two new human food chains; one for a vegetarian and one for a meat-eater. Children look at food chains involving a centipede and earthworm, starfish and spider. They identify the questions they can now answer from the true or false sorting activity from lesson 1.
	4	Two	All living things	Children explore the impact of environmental change on people and on living things, looking particularly at the impact of fire and flooding. They make a display about historical fires or floods and add sticky notes to it suggesting how different living things were affected.
5	Two	All living things	Children explore different ways people try to reduce the impact of change on an environment and then research the effects of droughts, volcanoes etc. on living things. To see environmental change in action, children observe a patch of ground outside that had been previously covered up. They count the invertebrates they see and take photos and	

				look at pictures before and after the ground was covered and note the differences. Children learn that this was a small change but it still had a big impact.
	6	One + Assessment toolkit	All living things	Children prepare reports on changes to the environment that will be caused by a new neighbourhood being built. They decide on the three most important things they have learned during the unit, focussing particularly on their work on food chains and environmental change, and explain why they chose them.
SCIENCE WEEK linked to the National Science and Engineering website.				

SUMMER TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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 Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests 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
	1	Two	All living things Human nutrition	Children discuss their knowledge about food and digestion and predict what happens inside their bodies when they eat. They draw and label their predictions on a body map and recreate a diagram of the human digestive system. The finished drawings are shared and a glossary of organ names is created for future reference.
	2	Two	All living things	Children play a 'Ready, Steady, Digest!' game in pairs to demonstrate how a banana sandwich passes through the digestive system. They use a variety of materials to illustrate what happens as it goes from our mouths to our stomachs to the intestine. They then create a flow chart to record the sequence of digestion.
	3	Two	All living things	Children play a 'taboo' type game to recap names and functions of the organs in the digestive process. They make models of their own teeth from modelling clay and discuss different types of teeth and their functions. They consider how animal diets are related to the shape of an animal's teeth and play dental detectives, identifying animals by the dentition of their skulls.
4	Two	All living	Children briefly discuss their experiences with dentists and the different effects food and drink have on teeth. In	

			things	groups, children plan to investigate how different drinks affect our teeth. Children test their ideas by immersing eggshells in various liquids, identifying variables and recording results over time with words and pictures.
	5	Two	All living things	Children review the progress of their eggshell investigation. Their photos are placed in chronological order to compare before and after results. In groups, children create a poster flow chart of how tooth decay happens based on their own investigations as well as research from the internet and reference materials.
	6	One + Assessment toolkit	All living things	Children revisit their eggshell activity results and discuss how tooth decay can be avoided. In groups, children compare three different toothpastes through a variety of tests. They design the packaging for their ideal toothpaste before revisiting the digestive system. Children review their drawings on their body maps from Lesson 1 and make adjustments based on their learning.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEARGROUP: Year 5 Term 1

AUTUMN TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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 Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Using test results to make predictions to set up further comparative and fair tests Identifying scientific evidence that has been used to support or refute ideas or arguments.
	1	Two	Properties and Changes of Materials Separating mixtures	Children record prior knowledge of separating mixtures along with things they would like to learn. They explore separating mixtures of dry ingredients with sieves.
2	Two	Properties and Changes of Materials	Children investigate dissolving candy floss in water and a variety of other solids, some of which dissolve in water and some which do not. They observe what happens when water is added to the solids and the mixtures are kept and labelled for Lesson 4. Children explore the same concepts with baby oil in place of water. Groups of children are asked to add drops of water to candy floss and record how many drops it takes to completely dissolve the candy floss. Their solutions are left on the window ledge to be revisited in Lesson 4.	

	3	Two	Properties and Changes of Materials	Children decide on questions about dissolving to investigate using a fair method. Children plan a fair test and carry out their investigation, recording their results in a table and graph. Children work on another group's graph to identify five questions that the graph can be used to answer. The original group is given time to answer the questions.
	4	Two	Properties and Changes of Materials	Children observe their candy floss solutions from Lesson 2. Each group is given a jar containing a solution from Lesson 2 in which a substance has dissolved. Children predict what would happen if these solutions were treated like the candy floss solution. Using models, role play or pictures, and writing, children explain what they've learned to a younger child. They test their predictions by placing a small amount of their solution into a saucer to be revisited in a week's time.
	5	Two	Properties and Changes of Materials	Children learn about filtering water. In groups, children are asked to filter a cup of dirty water using funnels and plastic cups. They share their techniques and discuss which materials were easy to filter and which ones were not and revise their filter system accordingly. Children predict what will happen when icing sugar is added to water. They test their predictions and record their results.
	6	One + Assessment toolkit	Properties and Changes of Materials	Children make problem cards of three substances being mixed together. They record the techniques used to separate these materials on the back of the cards. Pairs read their cards out to the class, and other pairs record the techniques they would use on a whiteboard. On the count of three they reveal their answers, then discuss the ways in which their answers differ.

AUTUMN TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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. • Identifying scientific evidence that has been used to support or refute ideas or arguments. • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • 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 • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables

			<p>where necessary</p> <ul style="list-style-type: none"> Using test results to make predictions to set up further comparative and fair tests Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
1	Two	Forces	Children consider what they know about forces and record their ideas. They observe a toy car being pushed off the top of a table and record their ideas of what makes its movement change. Children read about Sir Isaac Newton and gravity and build a model to demonstrate the effects of gravity. Children discuss the difference in gravitational pull on Jupiter compared to Earth and record their ideas of what the gravitational pull would be like on a planet with less gravity and more gravity than Earth.
2	Two	Forces	Children think about the forces acting on a swing when a child is pushed in it and are introduced to the term 'friction'. They order themselves according to whether they think the soles of their shoes are 'grippy' or 'slippy'. Groups explore different force meters and compare the soles of different shoes to find out which is the most 'slippy' or 'grippy'. They use their results to draw conclusions about the shoes and discuss similarities and differences between groups.
3	Two	Forces	Children observe the differences in paper falling to the ground when one piece is scrunched up and the other is flat. They learn that there are opposite forces to gravity that reduce the rate of the falling paper and that greater surface area means more air resistance and that air resistance is a form of friction. Children are given a selection of objects which use air resistance to reduce the effects of gravity. They explore how the objects fall to the ground.
4	Two	Forces	Children discuss what makes a boat move and recognise the effect of air resistance. They learn that two forces are acting on the boat: air resistance on the sail and the wind pushing the boat along. In groups, children make small models of a boat and explore trying to move them on the surface of water. They plan an investigation to find the best sail for their boat and share with another group for peer review. Children carry out the investigations and collect data, making a paper template of their sails.
5	Two	Forces	Children learn that water resistance is another force and causes friction between moving objects and water. In groups, children carry out an investigation to find out which is the best shaped hull for reducing water resistance. Groups produce a class display that summarises the technical specifications which make their hull so efficient.
6	One + Assessment toolkit	Forces	Children learn that simple mechanisms are pieces of equipment which rely on forces to make them work. They familiarise themselves with some simple mechanisms and learn the definitions for 'lever', 'pulley' and 'gears'. In groups, children make a model seesaw and measure the force needed to lift the different masses. In groups, children are given a selection of the sticky notes from Lesson 1 containing children's original thoughts on forces. They discuss them and discuss whether the statements are true or false before writing a summary of their learning across the unit.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEAR GROUP: Year 5 Term 2

SPRING TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the changes as humans develop to old age. Describe the life process of reproduction in some plants and animals. 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 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 Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Identifying scientific evidence that has been used to support or refute ideas or arguments.
	1	Two	Animals (including humans) Life Cycles	Children complete a quiz on life cycles and answer questions as a knowledge capture activity. They learn about the conventional features that represent life cycles and then research and draw the life cycles of animals of their choice. Using living things, such as frogspawn, chicks or plants, children begin to observe real life cycles.
	2	Two	Animals (including humans)	Children monitor the growth of their plant or animal from Lesson 1 and predict what they expect the measurements and changes to be in the next lesson. Children discuss similarities and differences between life cycles and learn about the work of Jane Goodall. The main features of life cycles are discussed and compared and children research and map a timeline for their chosen animal.
3	Two	Animals	Children measure the growth of their living things and predict the measurements for the next lesson. The	

			(including humans)	teacher introduces children to the term metamorphosis and children create a performance piece to show to younger children and their classmates what happens to an animal during metamorphosis. They then research animals with three or four stages of complete and incomplete metamorphosis.
	4	Two	Animals (including humans)	Children measure their growing plant or animal and predict the measurements for the next lesson. They discuss the human life cycle and make a human timeline. Children model an example of linking different egg sizes to the time it takes to hatch and they research the gestation times of humans and animals.
	5	Two	Animals (including humans)	Children measure the growth of their living thing and predict measurements for the next lesson. In groups outside, they try to find examples of different stages of plant or animal life cycles, recording their findings using cameras. The teacher uses the photographs to make a 'fill in the blanks' life cycle for children to complete.
	6	One + Assessment toolkit	Animals (including humans)	Children visit a botanic garden, pond-dipping site or similar place and note down plants and animals that they see. They choose one example of a plant or animal to investigate. Back in the classroom, children consider how scientists try to find rules to describe the behaviour of living things so they can make predictions. Children look at the data they have collected from their living things and come up with ways to present the data.

SPRING TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • Describe the Sun, Earth and Moon as approximately spherical bodies • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. • Describe the movement of the Moon relative to the Earth • Identifying scientific evidence that has been used to support or refute ideas or arguments. • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys,

			<p>tables, scatter graphs, bar and line graphs</p> <ul style="list-style-type: none"> Using test results to make predictions to set up further comparative and fair tests
1	Two	Earth, Space and magnetism	Children watch an introductory video about space and create posters which have possible answers to questions about day and night. In groups, children answer questions and place their answers on the poster 'answer' that matches. Children draw on whiteboards what they think Earth, the Sun and the Moon look like in relation to each other, thinking about shape, size and distance. They select objects to represent Earth, the Sun and the Moon (e.g. marbles, tennis balls, peas etc.) and give justifications for their choices. As a class, make a reasonable model and photograph for a class record.
2	Two	Earth, Space and magnetism	Children read about historical theories and how ideas have changed and think of and share evidence to present to scientists from history to make them change their theories. They then make their own mnemonics for remembering the order of the planets to share with the class before going outside and modelling planets orbiting the Sun.
3	Two	Earth, Space and magnetism	Children learn about Earth spinning on an axis and they model how we get day and night. They answer time-related questions about different countries and show how if it is day on one side of the globe, it will be night on the other. Finally, children read about the International Space Station and, in groups, create a short stop-motion film explaining how we get day and night.
4	Two	Earth, Space and magnetism	The teacher models with children how, even when an object remains stationary, it can appear to move. Children are introduced to the idea of finding a pattern between shadows and the position of the Sun and they explain the reasons for the Sun's apparent movement in the sky.
5	Two	Earth, Space and magnetism	Children share what they know about the Moon and discuss its orbit around Earth. Model the phases of the Moon by placing one child in the position of the Sun and the rest around them, representing Earth at its various orbit positions. Move around the inside of the circle with a bi-coloured ball (the Moon) asking children what shape they can see on the ball.
6	One + Assessment toolkit	Earth, Space and magnetism	Children rehearse their thoughts and collect evidence to help them answer the question 'Does Earth move?' The teacher hot-seats as Aristotle and children refute his ideas.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEAR GROUP: Year 5 Term 3

SUMMER TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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. 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 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. Using test results to make predictions to set up further comparative and fair tests Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
	1	Two	Properties of Materials Types of change	Children are introduced to the Quest: How can we make a meal from a mixture? Children make booklets labelled 'Materials dictionary' and write definitions for terms relating to separating mixtures and types of change. In groups, children predict how many drops of water it will take to dissolve granulated sweetener, icing sugar and caster sugar. They test their predictions and record the results.
	2	Two	Materials	Children observe their solutions from the previous lesson and predict what would happen if water was added once more. Children add water and place their solutions in the same spot to be revisited later. They repeat their investigation on solubility with cinnamon rather than sugar and observe the differences. Each group is given a bag containing sugar, cinnamon and dried fruit. They list how they would separate the mixture by order of ingredients and techniques.
3	Two	Materials	Children describe the properties of an ice cube. In pairs, children are given a cup of hot water with a lid and a	

				piece of wax. They observe what happens to the wax when it is placed on the lid as an example of a reversible change. Children are given a variety of materials and predict which ones will melt on top of hot water and which ones won't. They test their predictions and conduct further research to then share with the class. Each group is given a jelly sweet to add to hot water as they consider the difference between the melting stage and the dissolving stage.
	4	Two	Materials	Children learn that burning is an irreversible change and they discuss new materials made from burning and when burning might be useful. Children make biscuit mix and test what happens when they are put in the oven, observing them every five minutes, as another example of irreversible change.
	5	Two	Materials	In groups, children observe the effects of mixing vinegar and bicarbonate of soda. Children discuss various acids that are used in the kitchen, and are given a variety of materials such as a stop watch, cylinder, tape measure, beakers, bicarbonate of soda, water and acids to use to test the reaction rates of bicarbonate of soda and acid. Children choose a question that can be answered with a fair test and then plan and carry out their investigation.
	6	One + Assessment toolkit	Materials	Children read and revise their 'Materials dictionaries' and discuss any revisions. Children are asked to create a meal using given ingredients, mixtures and heat. They record their recipes in groups, making note of types of changes involved.
SCIENCE WEEK linked to the National Science and Engineering website.				

SUMMER TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> • 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 • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • 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. • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

			<ul style="list-style-type: none"> • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Using test results to make predictions to set up further comparative and fair tests
1	Two	Properties of materials	Children learn to describe a material by listing its properties. In groups, children are given a variety of materials to sort. They record the different ways of classifying the materials they have identified. In groups, children play 'twenty-questions' about different types of materials.
2	Two	Properties of materials	Children think about the different materials they can see around the classroom and what they are used for. They complete a survey of these different materials and their purposes, trying to make their lists as diverse as possible. Using a few examples from their lists, children think of alternative materials. Children take an electric plug apart and look at the different materials inside, thinking about conductivity and insulation. In a large circle, children act like wires and a switch and touch a cosmic energy ball, demonstrating complete and broken circuits.
3	Two	Properties of materials	Children think of materials that are good thermal conductors and how you would describe a good thermal insulator. Children look at a ski/outdoor jacket and read about the development of different materials for extreme weather. They then order a selection of materials according to how well they think they will insulate something.
4	Two	Properties of materials	In pairs, children research the advantages and disadvantages of different types of material. They create a poster and discuss their findings as a group. Children think about their Quest and how objects can be made from a variety of materials. In groups, children explore and compare materials, thinking about their suitability for certain purposes. Their questions are recorded and children discuss ideas on making a reliable investigation into testing candy lace stretchiness.
5	Two	Properties of materials	In groups, children plan an investigation to answer the questions they raised in Lesson 4. Groups swap plans and then carry out their investigations. The findings are swapped with another group who annotate their results. Children use their knowledge on properties of materials to think of possible materials for answering their Quest question.
6	One + Assessment toolkit	Properties of materials	Children play a true or false activity and look back at their initial thoughts from Lesson 1. They plan and design their guinea pig outdoor shelter to answer their Quest and give reasons for their choice of materials.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEARGROUP: Year 6 Term 1

AUTUMN TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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. Identifying scientific evidence that has been used to support or refute ideas or arguments. 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 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 Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Using test results to make predictions to set up further comparative and fair tests
	1	Two	All living things Classifying living things	Children are given some cards showing different living things and identify simple ways of classifying them. They explore different ways to classify living things in more details and use IT resources to research living things that scientists have struggled to classify.
	2	Two	All living things	Children learn about the five basic kingdoms of classification of living things before focusing on micro-organisms. Children watch a video about mouldy food, observing how micro-organisms cause food to decay and then consider how bacteria causes tooth decay. They discuss the role that yeast plays in making bread rise and they investigate how mould grows on bread.
3	Two	All living things	Children collate the results from their mouldy bread investigation for a report that they share with the class. Each group summarises the evidence they collected before coming up with conclusions based on their results. Children walk around the school to look for signs of decay.	

	4	Two	All living things	The class creates a list of animals which they then classify. In groups, children identify the characteristics of different leaves and create an identification key for leaves. They collect leaves from outside and record their characteristics for their identification key.
	5	Two	All living things	Children discuss the different characteristics of a buttercup. They then name as many flowers as they can and re-evaluate their descriptions of buttercups and, if possible, are taken to a part of the school grounds where they can examine and draw buttercups. They compare their results, discussing ways in which their descriptions vary.
	6	One + Assessment toolkit	All living things	Children investigate earthworms, focusing on key features. Children are reminded of 'worm charming' and think of ways to bring worms out of the soil. Using a mustard solution and other materials, children collect worms. They record the number and type of worms they find before returning them to the soil. Children answer questions in a 'Weird and wonderful living things quiz.'

AUTUMN TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Describe the ways in which nutrients and water are transported within animals, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 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 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
	1	Two	Animals including humans Our bodies	Groups create body maps by drawing around each other. They fill in the body maps with things they remember about body systems and then discuss what they think the heart does and what its function is. They discuss historical ideas about the heart and how they have changed. Children find their pulse and see how many times their hearts beat in a minute.
2	Two	Animals	Children learn about the function of the heart and about the three different types of blood vessels. The teacher gives	

			including humans	children a small mirror and they look at the veins in the front of their mouth when they pull their lower lip down. Outside, the teacher makes a double loop pathway to represent blood's journey. Children act as the blood cells and follow the loop, picking up and dropping off 'oxygen' and 'waste' etc.
	3	Two	Animals including humans	Children make a documentary film about what the heart is, what it does and why it is important. They explain that increased pulse rate during exercise is due to higher demand for oxygen before exploring how advertisements talk about 'health' and 'diets'.
	4	Two	Animals including humans	Children discuss balanced diets and they interview others about what they do to stay healthy. Watch the videos as a class and children make a pie chart or bar graph for the results. They discuss how the digestive system and circulatory system work together and review the body maps from Lesson 1.
	5	Two	Animals including humans	Children recap what they've learned so far and discuss the possible effects of an unhealthy lifestyle. They make lists of drugs, discussing the difference between drugs and medicines and they discuss the health implications of becoming addicted to drugs. In pairs, children make a health education poster to be displayed around the school.
	6	One + Assessment toolkit	Animals including humans	Children use all the evidence they have collected from the unit to present their ideas as a 'Health Road Show'. In groups, children look after a table where they will exhibit their work from the topic. They present to a wider audience and show documentary films that they have created around the school.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEAR GROUP: Year 6 Term 2

SPRING TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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 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 Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 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
	1	Two	Light	Children draw annotated cartoons to be kept for Lesson 6 on how they think people see things and the role of light in this. They learn that a light source is something that makes its own light and they think about why some things might be mistaken for a light source. They begin to think of light as a 'journey' from a source to the eye.
	2	Two	Light	Children discuss the Sun as our most important source of light and they are shown what a light beam looks like. The teacher shows the class a model of the path of light from the Sun to Earth using a torch in a dark room.
3	Two	Light	Children think about what would happen if they put a black object in a black box. They investigate a similar idea using tubes and discuss what would need to happen to be able to see the objects at the bottom of the tube. They explore different effects of placing holes in different areas of the tubes and shining a torch through the holes before discussing how light travels and reflects.	

	4	Two	Light	Children discuss how the Pepper's ghost trick works. They then investigate bouncing a tennis ball off an even wall to model how light can be reflected and then contrast the action on an uneven surface. Children make periscopes and discuss the path of light through periscopes.
	5	Two	Light	Children recap the plan for the investigation for the clothing manufacturer and consider how clothes can keep you safe. Discuss how children will record and present their results. After the investigation, children share their reports with the class.
	6	One + Assessment toolkit	Light	Children create shadows of different lengths and directions. With a child volunteering, the teacher demonstrates to the class the 'reverse shadow' method of using water to spray a 'reverse shadow' of the child's hand onto paper – the water mimicking light. Children make any changes they want to, to their annotated cartoons from Lesson 1 and make a mini-book about what they have learned in this unit.

SPRING TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to: <ul style="list-style-type: none"> • Use recognised symbols when representing a simple circuit in a diagram. • 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 • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Identifying scientific evidence that has been used to support or refute ideas or arguments. • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • 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 • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
	1	Two	Electricity	In groups, children are given a tray of electrical components and draw a circuit to make a bulb light. Their drawings are compared and standard symbols used by scientists and engineers are introduced. Children re-draw their circuits

				using the symbols, then swap their drawings with other groups.
	2	Two	Electricity	In groups, children match circuit symbols with electrical components provided for them. They are given a selection of batteries with different voltages and investigate the relationship between batteries and bulb brightness. In pairs, children suggest how electricity lights a bulb and explain the effects of changing the number of bulbs in a circuit.
	3	Two	Electricity	In groups, children rank different circuits according to predictions made about the brightness of the bulb. Children test these predictions by building the circuits and then replace the bulb with a buzzer to see how volume is affected. Groups are challenged to build a circuit where the buzzer is as quiet as possible.
	4	Two	Electricity	Children re-visit what they know about altering brightness and volume and are introduced to wires. They observe the differences between selections of wires, then come up with questions to prompt investigations about different wires and bulb brightness. Children make a giant circuit with one cell, one bulb and two wires. They observe the effects of adding more wires to the circuit until the light goes out.
	5	Two	Electricity	In groups, children make a circuit to turn a buzzer on and off. They then make a break in the circuit, attaching an extra wire with a crocodile clip and test different suggestions for what can be used to turn the buzzer on.
	6	One + Assessment toolkit	Electricity	Children review circuit diagram symbols and build a circuit to make a motor turn. They discuss mending a faulty scoreboard, adding faults and remedies to their fault finder posters.



MEDIUM TERM PLANNING: Science Bug

WHYBRIDGE JUNIOR SCHOOL

SUBJECT: Science

SUBJECT LEADER: Terri Pettican

YEAR GROUP: Year 6 Term 3

SUMMER TERM 1	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to:
				<ul style="list-style-type: none"> 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. Identifying scientific evidence that has been used to support or refute ideas or arguments. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 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
	1	Two	Evolution and Inheritance	Children discuss what they think 'evolution' means and learn about Charles Darwin. They are given 'secret notebooks' to record their ideas for the unit in and note three things they believe about evolution and three things they want to find out. They discuss possible reasons for dinosaurs no longer existing and learn about the idea that some evolved over time into birds. Children put historical events in chronological order and watch a video on geological time.
	2	Two	Evolution and Inheritance	Children recap the idea of evolution being a process of change in living things over time and think how families often share characteristics. They learn that this is called 'inheritance' and that it helps to explain evolution. Children play 'Chinese whispers' to reinforce this idea of change and adaptation.
3	Two	Evolution and Inheritance	Children compare animals and discuss their similarities and differences. They learn that individuals within a species have different characteristics and learn about Charles Darwin's theory of natural selection. They role play an animal and move to the area of the classroom (a 'hot' side and a 'cold' side) where they think the animal would best survive. In groups, children create a poster of an imaginary island, detailing the climate and food sources etc. Choosing one island, the group decides which children (role playing as animals) would survive there or not.	

	4	Two	Evolution and Inheritance	Children learn about Darwin's travels to the Galapagos islands and focus on his study of finches. Two volunteers demonstrate the idea of beak adaptation, trying to use different 'beaks' to eat certain 'food'. They learn about survival of the fittest and how adaptations are only advantageous if the species lives long enough to reproduce and pass on their features. Children create a fact card, using research, about a plant or animal and how it has adapted to its environment.
		Two	Evolution and Inheritance	Children learn that animals don't choose the characteristics that best suit their environment. They look at an animal that evolved to suit its environment in a relatively short space of time. Following an example, children work in pairs to design an imaginary creature that would survive really well in a school or other environment of their choice. They use art materials to make their plant or animal and share with the class, thinking about how the environments might change in the future.
	6	One + Assessment toolkit	Evolution and Inheritance	In pairs or groups, children research an element of evolution and inheritance and present their research to the class through a presentation. Children look at their initial thoughts on evolution and write a short description and explanation about evolution in their notebooks.
This unit may be taught in Summer 2 due to SATs and revision. It is up to the discretion of the teachers.				
SCIENCE WEEK linked to the National Science and Engineering website.				

SUMMER TERM 2	Week	Date & no of lessons	Topic and Learning Challenge	Pupils should be taught to: <ul style="list-style-type: none"> Identifying scientific evidence that has been used to support or refute ideas or arguments.
	1	Two		Children review the science units they have completed across KS2. They select the units where they feel they learned a lot and identify areas where they would like some more revision. In groups, children create a science newspaper about what they have learned in their science lessons. Different groups should aim to base their newspaper articles on different areas of the curriculum and find photographs and people to interview. The finished newspapers are distributed and displayed.
	2	Two		In groups, children are given a statement and have to mime the content of their statement for the rest of the class to guess. Children try to bring out all the key points they have learned around that science topic in their mime and celebrate what they have learned.
	3	Two		In groups, children teach a small group of younger children a short science lesson. They select a unit which contains

			information which they can teach in an interesting way to younger children. Children plan and then practice delivering their lessons. They teach the lessons to each other and offer feedback before showing their finalised lessons to the younger children.
4	Two		In groups, children review the science units they completed in KS2. Each group creates a science song about a topic they want to revise. They make up new lyrics to a well-known tune and use their chosen song to help others understand that area of science, including as many science terms as they can which fit the tune. Children then perform their songs in a little concert which is recorded.
5	Two		In groups, children create questions for a science quiz which has multiple choice answers. The children are divided into two teams to cover different statements. Children use IT resources and reference materials to help set their questions and try the questions on their fellow team members to get constructive feedback. The quiz game is then played as a class.
6	One + Assessment toolkit		Children have blogs set up for them on the school website. In groups, they review the KS2 science units they have covered and the areas they are confident in and the areas they would like more revision. In pairs, children create a science blog about the things they have learned. Pairs cover different areas of the curriculum and focus on the most important learning points from each part. The blogs are published and shared with the class.
This is an optional unit. Due to SATs this unit may not be taught, due to revision; it may be shortened and taught in a reduced amount of time.			