

Science Scheme of Work

The Curriculum

The curriculum has been developed by using and widening the National Curriculum in order to produce a broad and balanced progressive, sequential long-term plan with consideration of the local area and resource. All aspects of which comply with legislation and national guidance, this includes the teaching of Careers Education, Information, Advice and Guidance (CEIAG) across school.

Science

The **intent** of our science curriculum is to deliver a curriculum which is accessible to all and will inspire **happy confident independent learners** who are **prepared for adulthood**. As a result of this they will:

- Understand their own bodies and how to maintain good physical and sexual health
- Develop their knowledge of the plant world: how they grow, are cared for, and propagated
- Develop their knowledge of the animal world: how they are nourished, grow, are cared for and reproduce
- Examine, use and create with the material world around them: how materials are used, the seasons change; and how light, sound and forces affect and can help us
- Understand the evidence of environment change and of how humans can have positive and negative effects on the environment
- Develop their understanding of how lifestyle choices may affect a person's health and well being, including smoking, alcohol, medicines, drugs and sexual health
- Develop their use of the scientific method of predicting, observing, measuring, recording and drawing inferences about observations

From the long term plan a scheme of work has been produced and **implemented** which has high and equal aspirations for all learners and incorporates:

- **PFA links**
- **Cultural Capital links**
- **Reading opportunities**
- **Key Vocabulary**
- **Planned differentiation, Resource, Support or activity**

Class groups are based upon English ability; therefore, each science group has a wide range of abilities. With this in mind, each unit planned has a set of progressive and sequenced skills and knowledge objectives at three levels: **Anning, Galileo, Einstein**. This allows us to differentiate, challenge and extend all of our children in each class, no matter their ability.

Long-Term Science plan

The curriculum that is in place is based upon two things:

- 1) Science activities that lead to achieving **the school's intent** - to deliver a curriculum which is accessible to all and will inspire **happy, confident, independent learners who are prepared for adulthood**.
- 2) Science that is relevant, usable and **supports individual learning needs** of students at Epinay School.

In order for us to achieve this, we have based our scheme of work on the following **3 key statements** across the academic year.

1. To become a healthy and informed adult.
2. To understand our environment.
3. To prepare for employment in the construction, horticulture or catering industries.

Overview for Phases 2 and 3

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9
Autumn 1	Exploring our bodies - 1	Exploring our bodies - 2	Exploring our bodies - 3	Exploring our bodies - 4	Exploring our bodies - 5	Exploring our bodies - 6	Exploring our bodies - 7	Exploring our bodies - 8	Exploring our bodies - 9
Autumn 2	Materials and forces - 1	Materials and forces - 2	Materials and forces - 3	Materials and forces - 4	Materials and forces - 5	Materials and forces - 6	Materials and forces - 7	Materials and forces - 8	Materials and forces - 9
Spring 1	Animals and growth - 1-2	Animals and growth - 2-3	Animals and growth - 3-4	Animals and growth - 4-5	Animals and growth - 5-7	Animals and growth - 7-8	Animals and growth - 9-11	Animals and growth - 12-13	Animals and growth - 14-15
Spring 2	Our environment - 1	Our environment - 2	Our environment - 3	Our environment - 4	Our environment - 5	Our environment - 6	Our environment - 7	Our environment - 8	Our environment - 9

Summer 1	Plants and horticulture - 1	Plants and horticulture - 2	Plants and horticulture - 3	Plants and horticulture - 4	Plants and horticulture - 5	Plants and horticulture - 6	Plants and horticulture - 7	Plants and horticulture - 8	Plants and horticulture - 9
Summer 2	Light, sound and electricity - 1	Light, sound and electricity - 2	Light, sound and electricity - 3	Light, sound and electricity - 4	Light, sound and electricity - 5	Light, sound and electricity - 6	Light, sound and electricity - 7	Light, sound and electricity - 8	Light, sound and electricity - 9, 10

At Epinay school there are a range of students with complex needs. 100% of students are diagnosed as having a learning difficulty/disability, within this a large % of students are diagnosed as having ASD, MLD and SLD (May, 2022). These developmental disabilities can cause significant social, communication and behavioural challenges. They affect how a person acts and interacts with others, communicates, and learns.

For this reason science activities have been carefully chosen to reflect this. students generally have difficulties in the following areas:

- Processing information - organising ,sequencing and prioritising.
- Drawing inferences and conclusions in the world around us, including understanding and communicating with others.

The scheme of work has been designed to ensure students can develop these areas, whilst also ensuring that science at Epinay is inclusive for all learners, and that they can take part in all lessons with a varied degree of differentiation and support.

A rationale as to why each element of science is included, whilst also looking at progression of skills and knowledge throughout each phase. We are mindful that in mixed ability classes there are students of varying abilities in science, therefore students will progress through the skills and knowledge at an appropriate and challenging pace, with the overall intent being that they are working towards the 3 key science statements and are ultimately prepared for accreditation at phase 4 and on into adulthood.

Progression of skills and knowledge

Phase 1 - Students work towards meeting phase 1 targets based on EYFS play based learning and good practice.

Phase 2 & 3 - Students build on the skills knowledge gained in phase 1 and work through progressive objectives

Phase 4 - Students are in a place to use the skills and knowledge gained in Phase 2 and 3 to begin a chosen qualification route, this may be the Entry Level Certificate or GCSE dependent upon ability.

Phase 5 - Students are in a place to use the skills and knowledge gained in Phase 4 to achieve a higher level of qualification if it is their chosen pathway but do not access core science sessions.




Science Scheme of Work

Autumn 1 - Exploring our bodies

Rationale: Benefits for our students are:

- Prepares students at the start of the science curriculum to develop understanding of being safe and healthy
- Reminded of practices to maintain good hygiene and health after the summer break
- Explores areas which may cause anxiety or concern to students, which can be discussed promptly after the summer break

The objectives that children meet are logged electronically. Termly progress data is collected, analysed and reported on.

Planned PFA Links/SMSC		Stapleton House care home visit, matrix (drug and alcohol), schools meals service talk, dietician, dental nurse visit, visit to cafe (interior or exterior), feasts of various foods or food cultures, Mr Martin (visual impaired service)	
Planned Reading Opportunities		To identify reading opportunities linked to the school reading spine; Pie Corbett which draws upon comprehension, a love of reading and subject knowledge links. I Used to be the Baby Food from the World	
Planned Key Vocabulary - Subject specific		Brain, stomach, skeleton, rib, animal, tooth/teeth, system, circulatory, cardiovascular, nervous, hygiene, food groups/nutrients	
Anning 		Galileo 	Einstein 
Exploring our bodies - Autumn 1			
1	Demonstrate the use of and name the main external parts of the human body.	Demonstrate where the skull, ribs, backbone, 'arm bones' and 'leg bones' are and their functions.	Explain why skeletons are important. Compare skeletons of humans and other animals.
2	Move one's body in a coordinated way: 'left foot in,	Explore how the bodies of animals are different:	Demonstrate how muscles work sometimes in

	right foot out'.	fur, feathers, two legs, four legs, trunks, sharp teeth, blunt teeth, etc. (Active Learning opportunity).	pairs.
3	Point to where the brain, eyes, ears, heart, stomach, private parts and 'bum' are.	Explain what the brain/nerves, heart/blood, stomach/'bum' do.	Explain what the nervous, circulatory and digestive systems do.
4	Demonstrate the use of each sense by describing sights, sounds, feelings, tastes and smells.	Describe different sights, sounds, textures, tastes and smells using more than one adjective for each.	Explore the consequences of not having particular senses: what does it mean to be visually impaired, to be deaf, etc.
5	Demonstrate how to wash your hair and teeth.	Explain the function of each type of tooth.	Explain why personal hygiene is important or what may happen if hair or private parts are not cleaned.
6	Demonstrate how to use a tissue to wipe one's nose, how to clean one's hands and how to clean surfaces before eating or cooking.	Explain the effects of germs or the consequences of poor personal hygiene (colds, coughs, dirty/smelly/greasy hair).	Identify microorganisms as bacteria, viruses or fungi according to how they look; explain how germs are spread via surfaces, the air, touch and sexual contact
7	Group healthy and unhealthy foods.	Describe how unhealthy food affects health and teeth	Describe what each part of the food group does to our bodies (e.g. carbohydrates are used for energy).
8	Take part in a range of physical exercises. Active Learning opportunity.	Describe the effects of exercise. Active Learning opportunity.	Measure the effects of exercise and explain why it is good for us. Active Learning opportunity.
9	List or group substances which have a bad effect on one's health: smoking, alcohol, bad diets, illegal drugs (judge as appropriate)	Describe the difference between prescription/legal drugs and illegal drugs; describe the physiological effects legal and illegal drugs may have on the body (e.g. alcohol slows responses, cigarettes may cause cancer)	Explain why vaccinations are important, the effect they have (e.g. comparing protection periods of TB and coronavirus vaccines), and simply how they work




Science Scheme of Work

Autumn 2 - Materials and forces

Rationale: Benefits for our students are:

- Explore the physical world around us: materials, forces and how to manipulate them
- Heavily practical based work for indoors during the autumn 2 term.
- Students learn skills required for other subjects: observing, measuring and making inferences

The objectives that children meet are logged electronically. Termly progress data is collected, analysed and reported on.

Planned PFA Links/SMSC		Garden centre visit, invention shed Harrison Fields allotments visit, Marsden Grotto visit	
Planned Reading Opportunities		Bridges (FF), Making a Cake (FF) To identify reading opportunities linked to the school reading spine; Ple Corbett which draws upon comprehension, a love of reading and subject knowledge links.	
Planned Key Vocabulary - Subject specific		Solid, liquid, gas, property, weight, height, mass, weight, strength, flexibility, friction, buoyancy, air resistance, availability, sustainability, metal, wood, stone, plastic	
Anning 		Galileo 	Einstein 
Materials and forces - Autumn 2			
1	Describe different materials with words such as 'rough', 'smooth', 'hard', 'soft' and its colour	Describe and measure the strength and flexibility of some materials (e.g. how much paper or wooden bridges bend with weights).	Experiment with more abstract properties of materials: friction, buoyancy, air resistance.
2	Recognise that an object's name is not its material (pointing to a desk and asking 'what material is this?' should elicit 'wood', not 'desk'.	Identify materials according to group: metals, wood, stone, etc.	Distinguish between natural and human-made materials (usually by shape or smoothness).
3	Identify which clothes are appropriate for winter and summer weather.	Investigate the best conditions for drying clothes.	Investigate and compare the insulation properties of different materials.
4	Investigate which shoes are best to wear in	Carry out investigations into gravity (marbles in	Compare and explain the marbles in oil

	slippery conditions.	oil), friction (material blocks on a ramp) and air resistance (egg parachutes).	experiment, the friction block experiment and the egg parachute experiment.
5	Identify materials as solids, liquids or gases.	Name some of the properties of solids, liquids and gases (solids are hard, gases disperse, etc.).	Name and investigate state changes: boiling, melting, freezing, condensing.
6	Identify forces are pushes (e.g. thrust, magnetism between similar poles), pulls (e.g. gravity) or twists (e.g. the 'moment' of turning a door handle).	Group forces as 'contact' (e.g. thrust or friction) and 'non-contact' forces (e.g. gravity or magnetism).	Identify where balanced and unbalanced forces occur and what the consequence is (movement).
7	Use a see-saw to investigate how it changes as weights are balanced or unbalanced on one side or the other.	Investigate how work feels easier when using a lever, pulley or set of gears.	Identify mechanisms as pulleys, gears or levers.
8	Investigate how magnets attract and repel each other and iron/steel objects, introducing the words 'attract' and 'repel'.	Investigate which materials are magnetic or not (only iron or steel are common around us); explain how this could be used for sorting and recycling metals (what happens to the non-iron metals?).	Using iron filings and a bar magnet, draw the 'magnetic field' around the bar magnet; describe the field's shape.
9	Choose the best material for a particular purpose (e.g. making a blanket from wool or felt, rather than paper).	Comparing which materials are better or worse for a specific purpose (e.g. comparing the strength of paper and cardboard bridges with weights).	Evaluating the use of folds, creases and other structures when using a material (e.g. comparing paper bridges, one without creases/folds, one with).




Science Scheme of Work

Spring 1 - Animals and growth

Rationale: Benefits for our students are:

- Exploring the regrowth and regeneration of living things around us in the Spring.
- Learning about animals and growth can involve lots of outside learning opportunities.
- Students learn to understand both their own bodies better, but also how to care for and understand the lives of other animals.

The objectives that children meet are logged electronically. Termly progress data is collected, analysed and reported on.

Planned PFA Links/SMSC		Bill Quay Farm visit to inspire animal-related employment. Zoolab visit	
Planned Reading Opportunities		Animal Hospital (FF) To identify reading opportunities linked to the school reading spine; Pie Corbett which draws upon comprehension, a love of reading and subject knowledge links.	
Planned Key Vocabulary - Subject specific		Animal, life, cycle, chicken (and other specific animal names), breed, habitat, mammal, reptile, bird, amphibian, etc.	
Anning 		Galileo 	Einstein 
Animals and growth - Spring 1			
1	Recognise and name a range of pets and farm animals	Identify the characteristics of some pets and farm animals	Compare and contrast a range of animal appearances.
2	Group alive and non-alive things. Active Learning opportunity.	Describe some characteristics of some alive things (moving, eating, reproducing) and group things by these criteria. Active Learning opportunity.	Recall and group things by MRSGREN (movement, reproduction, sensitivity, growth, respiration, excretion and nutrition).
3	Recall some ways by which we care for animals (e.g. feeding, cleaning).	Research the diet of and prepare food for a selected animal (e.g. chicken, guinea pig, tortoise).	Identify and explain the individual needs of specific animals (e.g. a dog requires frequent walks as it requires the exercise, tropical fish require warm water as it matches their natural habitat, etc.).
4	Match common animals with what foods they eat.	Identify individual animals in pairs as predator or prey.	Construct a food chain containing a producer and consumers.
5	Recall some diets of some common animals (e.g. birds eat seeds, cows eat grass).	Compare animal diets to human diets, including vegetarian and vegan. Explain the pros and cons of each.	Group living things as herbivore, carnivore or omnivore.
6	Group farm animals and pets using a range of characteristics (e.g. by the colour of fur, floppy	Identify and group the characteristics of different animal breeds (e.g. breeds of sheep, dog, cow,	Explain how natural or artificial selection has 'chosen' various breeds of animal for specific

	ears, etc.).	cat, etc.).	purposes, e.g. sheepdog for herding, dairy cows for milk, etc.
7	Find and point out some animal habitats. Active Learning opportunity.	List animals from around the world and state their habitat type (e.g. polar bears in the arctic, camels in the desert).	Suggest instances where a habitat has changed with consequences on animals living there (e.g. gorillas in rainforest loss, red squirrels in Britain). Active Learning opportunity.
8	Recognise and name some of the minibeasts (worm, beetle, woodlouse, earwig, etc.).	Identify the microhabitats of some minibeasts (e.g. under logs, in dead bark, etc.).	Measure and record minibeast number per square metre; compare numbers between, for example, woodland and concrete yard.
9	List of characteristics of adult animals and their young (e.g. horse vs foal, cows vs calf, piglet vs pig, adult human vs baby human).	List the stages of human growth (baby, child, adult) and their main characteristics (e.g. adult men have beards).	List the characteristics of each stage of a human life (foetus, baby, child, adolescent, teenager, adult, old age).
10	List some characteristics of some animals (e.g. minibeasts have many legs, birds have feathers, etc.).	Group animals as having backbones or not (vertebrates vs invertebrates).	Group animals as mammals, birds, fish, reptiles, amphibians, according to characteristics (mammals have fur, etc.)
11	Use a series of 'yes/no' questions to identify plants and animals (e.g. "does it have red flower?", "does it have white fur?").	Use a 'yes/no' classification key to identify an animal given only its picture.	Write one's own 'yes/no' questions and construct an identification key for plants or animals.
12	Identify the characteristics of animals, including humans (e.g. blonde hair, green eyes, curly tail, long neck).	Measure how one person's characteristics are different from others (e.g. "I have red hair; she has blonde").	Classify some characteristics as inherited from parents (including animals, e.g. dog breeds), or as received from the environment (e.g. hair dye, tattoos).
13	Recall how some characteristics, like height or weight, can change over time.	Identify how animals have adapted to their environment: polar bears in the arctic, camels in the desert, etc.	Explain how natural selection selects the best characteristics randomly from animal populations.
14	Describe the external changes to the bodies of boys and girls undergoing puberty (e.g. body hair, breast growth, etc.).	Recall the names, positions and functions of the penis, testicles, scrotum, anus, uterus, ovary, fallopian tube, vagina.	Describe internal and psychological effects of puberty (girls begin menstruation, boys may become more aggressive).
15	Recall that a period is a natural maturing of a girl's body to prepare it to reproduce and how often they	Recall that women produce eggs (egg cells) and men produce sperm (sperm cells). Recall the	Explain human fertilisation as the meeting of sperm and egg cell.

occur. What sanitary products are and how to use them.	length and stages of menstruation.	
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Science Scheme of Work

Spring 2 - Our Environment

Rationale: Benefits for our students are:

- Visiting and exploring our environment in spring term while the weather is good.
- Students understand our environment and the challenges it faces to prepare them to be informed and active citizens.
- Students learn about how the seasons and environment affect their daily lives, from their clothes to long-term habitat change.

The objectives that children meet are logged electronically. Termly progress data is collected, analysed and reported on.

Planned PFA Links/SMSC	Use a wardrobe of clothes to choose suitable clothes for the season. Visit a supermarket to choose foods appropriate for the season. Visit South Shields beach to search for and collect plastic rubbish. Recycling plant visit, windfarm visit, Northumbria water plant visit		
Planned Reading Opportunities	A Place for Plastic (Twinkl eBook) To identify reading opportunities linked to the school reading spine; Pie Corbett which draws upon comprehension, a love of reading and subject knowledge links.		
Planned Key Vocabulary - Subject specific	Season, spring, summer, autumn, winter, Earth, Sun, pollution, renewable, nonrenewable, etc.		
Anning 	Galileo 	Einstein 	
Our environment - Spring 2			
1	Recall the names and observations in the four	Identify which months are in which seasons.	Explain how the seasons occur.




	seasons.		
2	Learn how to sow seeds.	Name the major parts of plants.	Explain the substances that plants need to survive; photosynthesis.
3	Choose clothes which are suitable for each season.	Demonstrate how clothes insulate against heat loss (e.g. by performing the 'huddling penguins' experiment).	Investigate how clothing colour affects how much heat is absorbed by the sun.
4	Identify and describe local or British animals: squirrels, rabbits, badgers, hedgehogs, cow/bull, deer/stag, sheep, goats, etc.	Describe the different habitats found in Britain and match their respective wildlife (e.g. badgers and rabbits are found in woodland, pigeons and foxes can be found in inner cities)	Compare how British habitats are changing, and how animal numbers are changing as a consequence (e.g. the successes of seagulls and foxes in cities, the loss of hedgehogs due to woodland habitat loss)
5	Demonstrate how to pick up litter safely.	Demonstrate how to sort rubbish into recyclable groups.	Create examples of upcycling: using recycled materials for other, creative uses.
6	Describe (or even demonstrate) ways to save water in one's house (turn off taps, using a bowl to clean fruit/veg not taps, shower instead of baths)	Investigate how to remove stones (sieving), mud and small plastics (filtration) from water; describe the effect of plastics on ocean life	Investigate the acidity and solid content of water samples (via distillation) taken from various sources (e.g. pure water, tap water, ground water)
7	Recognise some examples of the main pollution types and how to reduce them.	Identify some sources of pollution: noise pollution, light pollution and visual pollution.	Identify the sources and effects of each pollution type.
8	Recall some common sources of pollution: fossil fuel burning, plastics, household rubbish	Identify the negative effects that human have on their environments (e.g. habitat loss, deforestation, air pollution, noise pollution, light pollution)	Explain what one's 'carbon footprint' is and how to minimise it
9	Recognise and experience the burning of non-renewable fuels (without use of that word): wood, coal, paper, alcohol (as a substitute for burning petrol)	Identify and group energy sources as renewable (wind, solar, tidal) or nonrenewable (fossil fuels)	Compare and contrast controversial energy sources (nuclear and wood-burning) with renewable and non-renewable energy sources; debate their advantages and disadvantages

Summer 1: Plants and horticulture

Rationale: Benefits for our students are:

- Students sow, care for and harvest plants in the summer term.
- The health of the environment is studied so that students may become responsible and helpful citizens.
- An appreciation of the health, nutritional and environmental benefits of growing plants.

The objectives that children meet are logged electronically. Termly progress data is collected, analysed and reported on.

Planned PFA Links/SMSC		Garden centre or DIY store visit: what is it like working in a garden centre? Visit a supermarket to choose foods appropriate for the season. Bede's Burn (Jarrow) allotments visit: what are allotments, why do people use them? Visit local farm/strawberry picking etc	
Planned Reading Opportunities		Jack and the Beanstalk, The Enormous Turnip (Twinkl eBook) To identify reading opportunities linked to the school reading spine; Pie Corbett which draws upon comprehension, a love of reading and subject knowledge links.	
Planned Key Vocabulary - Subject specific		Stem, root, leaf, trunk, branch, fruit, vegetable, pollution, habitat, skin, pulp, flesh, skin, sweet, savoury, etc.	
Anning 		Galileo 	Einstein 
Plants and horticulture - Summer 1			
1	Point out and identify some simple plants; identify as being distinct from animals. Active Learning opportunity.	Identify and label the root, stem, branch, trunk, leaf, flower, fruit and tuber (vegetable) of plants. Active Learning opportunity.	Explain the functions of a plant's parts: stem (carrying food and water), leaf (making food), flower (reproduction), fruit (seed dispersal) and tuber (energy store). Active Learning opportunity.
2	Experience how fruit and vegetables look, feel, smell and taste.	Group fruit and vegetables by how they appear and taste (sweet, savoury, leafy, smooth, etc.).	Make a salad from a balanced amount of different fruit and/or vegetables.
3	Dissect some common fruit and vegetables, identifying the seeds, pulp, skin, etc.	Compare and contrast the similarities and differences between fruit and vegetables (e.g. seeds, flesh, sweet, savoury).	Name and give examples of the different seed dispersal methods (wind, water, explosion, hitching or burring).




4	Demonstrate how to sow seeds and water plants.	Identify the conditions required for plants to grow: sunlight, soil, water, air (carbon dioxide).	Investigate, compare and contrast how plants germinate and grow in different situations; e.g. in the dark, in gravel, without air (in a plastic bag).
5	Demonstrate how to dig a hole/furrow for planting and how to remove weeds by hand (with gloves).	Describe the differences in soil type (sandy, clay and loam), and explain when and where to apply compost.	Measure, compare and explain the water retention and acidity of soils; explain what this means for growing plants.
6	Identify some common British plants (no individual names required).	Group fruit and vegetables according to where they grow: British produce and international produce.	Identify the reasons why buying international, tinned or frozen fruit and vegetables is less beneficial to health, finances and the environment than fresh.
7	Count and tally selected plants found in a 1 m ² area.	Group plants by observable characteristics (has flowers, no flowers, white petals, prickles, etc.).	Identify and separate plants using a classification key (using 'yes'/'no' questions to follow a route down a diagram to identify a plant).
8	Describe simply the process of pollination.	Describe how insects seek nectar in flowers, and in so doing carry pollen from one flower's anther to another flower's ovary.	Explain why the bee population is decreasing (habitat loss and pollution), and what effects this may have on plants (flowering plants cannot reproduce).
9	Sow, grow and harvest a number of different plants (e.g. flowering plants, beans, and potatoes).	Identify the natural habitats of and compare the growth of plants which prefer dry, damp, sunny, shady conditions.	Measure and compare the effect of soil type on plant growth (e.g. comparing the school's soil against compost).

Summer 2: Light, sound and electricity

Rationale: Benefits for our students are:

- Learning about light and sound in the summer term, when outside experiments on light and sound are possible.
- Reminders about our safety around light, sound and electricity are timed to be in mind for the summer holidays.
- Students develop skills and knowledge to prepare themselves for living as an adult, to fix and use common household devices, keep safe in the sun and protect vital senses and organs for example at gigs/concerts.

The objectives that children meet are logged electronically. Termly progress data is collected, analysed and reported on.

Planned PFA Links/SMSC		Using household appliances such as irons, washing machines, lamps and computers safely. Cragside visit (first British house to be electrified), beach visit to observe effects of sun	
Planned Reading Opportunities		Electricity (FF) To identify reading opportunities linked to the school reading spine; Pie Corbett which draws upon comprehension, a love of reading and subject knowledge links.	
Planned Key Vocabulary - Subject specific		Light, source, sound, electricity, circuit, buzzer, battery, wire, etc.	
Anning 		Galileo 	Einstein 
Light, sound and electricity - Summer 2			
1	Recognise that we need light to see; that shadow or darkness is the absence of light.	Demonstrate how light travels in straight lines from the source to one's eyes (e.g. by using mirrors to redirect light sources or with a laser).	Demonstrate how white light (like from the sun) is composed of a spectrum of different colours (Newton's light diffraction experiment with prisms).
2	Demonstrate how to apply sun cream; explain how it and clothing protect us against the sun.	Investigate how the sun's light can burn and damage (e.g. use of magnifying glass to burn things).	Describe the danger of UV lights (e.g. the sun and sunbeds), the effects it can cause (e.g. ageing) and how to minimise the dangers.
3	Demonstrate how to protect our ears with ear defenders, ear plugs, moving away from the noise, etc.	Identify sounds which are likely to be dangerous to be around (e.g. pneumatic drills, aeroplane engines).	Sorts sounds according to their loudness on the decibel scale, identifying the level at which sounds become dangerous (i.e. about 100 dB).
4	Investigate the different sounds of various musical instruments.	Classify instrument sounds as percussive, string, wind, etc.	Explain how all sounds are caused by the vibration of a material (usually air, but not always).
5	Play and describe sounds of differing loudness and pitch/note.	Describe how different pitches (notes) can be made and how they sound different.	Explain high and low pitch sounds as vibrations of differing wavelengths (this word is not required) (e.g. by demonstration of a guitar's standing waves).
6	Identify devices which run on electricity (e.g. lights, microwave, computers).	Describe how electricity is generated from either renewable or nonrenewable sources, and how it is	Identify the relative advantages and disadvantages of each method of electricity

		carried to our houses.	generation.
7	Demonstrate how to safely connect and disconnect a mains plug.	Identify situations where electricity is a danger (e.g. around water, plug sockets, lightning), and describe what to do to lessen the danger	Identify real-life situations where high voltage or current are carried (e.g. pylons, substations) and compare them to low voltage or current devices (e.g. mobile phones, TV remotes); describe how to be safe in each different situation.
8	Make simple electrical circuits involving batteries, wires, switches and light bulbs.	Identify and use in a circuit the following electrical components: power pack, batteries, wires, light bulbs, motor, buzzer, and switch (electrical symbols not required)	Create electrical circuits for a specific purpose, which include a range of components and parallel circuits, including LEDs, motors, buzzers: make a doorbell, a morse code generator, etc.
9	Identify materials which allow electricity to pass through easily (conductors like metals) and not (insulators like wood) (use of the words "conductor" and "insulator" not required).	Investigate and identify materials as "conductors" and "insulators", explaining why copper is used for wires.	Investigate the resistance of copper wire by measuring the voltage and current along an increasingly long wire.
10	Demonstrate some basic steps to save electricity (e.g. turning off lights, turning off devices on standby).	Demonstrate and explain how to safely change a light bulb and the batteries of a common device (e.g. TV remote).	Demonstrate how to wire and change a fuse in a mains plug.