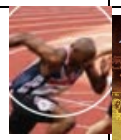
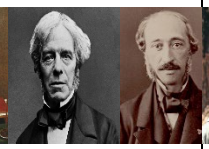
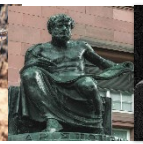
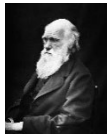
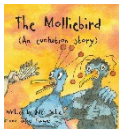
Science Knowledge and Skills Coverage. (Year 6)

		Animals Including Humans	Electricity	Living things and Habitats	Light
INTENT	Content/ Knowledge	I can identify the main parts of the human circulatory system and describe the function of the heart, blood vessels and blood. I can describe the ways in which nutrients and water and transported within animals including humans. I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	To 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. To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. To use recognised symbols when representing a simple circuit in a diagram.	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.	Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
	Book/ Science Capital	 Santorio  Dr Kat Dibb  Biomedical Scientist.  Dwain Chambers	  Volta  Faraday Becquerel	 Steve Irwin  Aristotle  Linnaeus  Jenner Fleming	 Optician
	Scientific Enquiry	Identify parts of the body Research Santorio and look for patterns. Identify parts of the blood. Use research to support explanation Conduct comparative test Use research to support ideas.	Identify electrical components. Notice patterns in my investigation. Comparative tests. Fair test Using research Identify components	Sort based on observable characteristics. Classify and sort using classification keys. Research genus and species. Research animals to classify Observe microorganisms over time. Notice patterns.	Look for patterns in how light is reflected. Use SK and research to make a periscope. Identify different parts of the eye. Look for patterns in observations. Use SK about refraction to make predictions I can look for patterns in how we see things.
	Working Scientifically	Use scientific diagrams Take accurate measurements Use labelled diagrams to explain Use models to explain my thinking Plan investigation and record results. Observe what happens using a model.	Answer questions by investigating Take accurate measurements Develop predictions Present results in line graph. Use diagrams to support explanation Scientific diagrams.	Record in a table Answer own questions. Use classification keys. Raise questions about animals to group. Observe and raise questions. Predict how microorganisms will decay food Evaluate effects of yeast.	Use scientific models and labelled diagrams. Use diagrams to support explanation. Make careful observations. Draw diagrams with accuracy Make predictions based on SK. Evaluate using scientific language
IMPLEMENTATION	Ideas/WOW moments.	1- Children create own model of the heart and explain how it works using scientific language. 2- Circulatory drama. Create a pendulum swing to measure pulse rate. Extra- heart dissection. 3-Explore heart location in animals. Children to make blood 4- Use picture of the heart to explain how blood flows in and out. Use skittles to demonstrate how nutrients are absorbed.	1- Circuit investigations. Practical activities. Electricity hazards. 2- Drawing electrical symbols. Will it work activity. What is electricity investigation. Measuring bulb brightness using data logger and recording in Lux. 3- What is a cell/battery? Children to make own fruit batteries.	1. Sort animals and leaves into broad groups. 2. Sort minibeasts, classify minibeasts using classification keys. Human classification. 3. Classification. Seven levels of Linnaeus System- Carolus Linnaeus. Different classifications based on Kingdom, Phylum, class, order, family, genus and species. Children classify an Can demonstrate the effect of gravity acting on an unsupported object. Can give examples of friction,	1. Dark den/box practical. History of light. Light maze activity. Use prisms to spot colour spectrum. 2. Know how a periscope works, how light is reflected and make own periscope. 3. Identify light sources. Explore if the moon is a light source. How does the eye work, how do we see? Children will look at optical illusions. Children will

IMPLEMENTATION		Understand why blood clots and the role of the platelets to form a scab. 5- Recap on healthy foods. Investigation into heart recovery rates. 6- Drugs and testing in sport, explore effects of smoking. Children create own smoking model. Explore importance of mental health.	4- Investigation into voltage. Investigation into changing the sound of a buzzer in a circuit using knowledge of voltage. 5- Create a game for the fair using knowledge of simple circuits. 6- Children to create a toy using more complicated components e.g. propellers, motors.	water resistance and air resistance. Can give examples of when it is beneficial to have high or low friction, water resistance, and air resistance. Can demonstrate how pulleys, levers and gears work. imals using Linnaeus scale. 4. Quirky creatures. Specific descriptions using facts. Children to use classification system to create own creature. 5. Learn about different microorganisms and how they are classified using the system. Good and bad bacteria. Food decay. Edward Jenner and smallpox vaccine. 6. Learn about the effects of Yeast, yeast experiment. Make bread to show the effects of yeast.	observe how the pupil reacts to light. Draw and label the eye. 4. Explain how we see things using diagrams. Experiment with shadows and changing the size of the shadow. Shadow investigation answering specific questions. 5. Refraction activities. Children will make their own magnifying glass and understand what refraction is. 6. Children will explore how rainbows are formed. Children will consolidate the language of the unit.
	Cross curricular links/opportunities	• **English**- following instructions and create instructions. Create poster. • **History**- looking at how the pulse metre was invented and people from the past. • **Maths**- calculating average and using a stop watch for measurement. • **IT**- watch video/clips/apps to help children with their explanations. Use of data loggers, pulse metres. • **PE**- Exercises to increase heart rate. • **DT**- Healthy foods and balanced diets. • **PSHE**- Medicines, drugs and mental health.	• **PSHE-** Danger with electricity • **English**- Can record explanations. Follow instructions. • **IT**- Use data loggers, apps to measure Lux. • **DT**- Investigating different fruits and their properties. Create a new product for the market. Choosing suitable materials. • **History**- learning about scientists in the past and present.	• **English**- following instructions. • **PSHE**- Hygiene. • **IT**- Use of stopwatch, videos and apps. (optional) time lapse videos • **DT**- Making bread, food hygiene. • **Maths**- sorting and classification. • **Art**- creating own creatures using a sorting system. Being creative. • **History**- learning about scientists in the past and present.	• **History**- recap the history of light. • **PSHE**- health and safety about not looking at the sun or shining light in the eye. • **DT**- Creating shadow by making shadow puppets. • **Maths**- sequencing of dates. • **English**- follow instructions, write detailed explanations. • **IT**- use of video and IT.
	Resources needed to accompany the scheme	• **Jars** • **2 x straws per group** • **Balloons** • **Water** • **Red food colouring** • **Post it notes** • **String, blu tac/plasticine, metre ruler, long strips of paper, elastic band, thread.** • **Marshmallows of different sizes, honey hoops/cheerios, fizzy balls, fluffy balls, raisins, water, red food colouring, oil, (optional) mints yellow food colouring. (other items you may find useful), bottle or zip lock bag.**	• **Batteries, Bulbs, Bulb holder, wires, Switch, motors.** • **Energy stick or energy ball. (Optional)** • **Batteries, Wires, Switch, lamps, Data logger/light sensor/ipad with lux app or equivalent, Ruler** • **digital clock, 2 lemons per group, wires, things to try as electrodes e.g. nails, paperclips, pennies.** **(You can use an LED light instead of a clock)** • **Other fruits/veg e.g. potatoes, limes, oranges etc to test.** • **Batteries, buzzers, switch, wires.** • **Craft materials e.g card, paper, pens.**	• **Range of leaves or leaf pictures in resources.** • **Whiteboards and pens** • **IT** • **Range of foods which decay quickly e.g. bread, bananas, tomatoes, oranges, mushroom, peach. (1 piece per group)** • **Zip lock bags.** • **1 ½ packets active dry yeast** • **1 cup cold water, 1 cup warm water (40-45˚C), 1 cup boiling water** • **12 teaspoons sugar** • **3 balloons** • **3 test tubes**	• **Bear caves (optional)** **Shoe box covered in black paper or dark cupboard/room.** **• A timer of some kind – egg timer or stopwatch** • **Torches, mirrors and reflective materials.** • **Card for periscopes.** • **Mirrors** • **toy, string, torch per group.** • **Cardboard** • **Scissors** • **Masking tape.** • **Acetate.** • **Blue light, red light, green light, pencil, whiteboard/wall.**

IMPLEMENTATION		• **White plate, skittles, water (jelly sweets) optional.** • **Golden syrup, water, corn flour, red food colouring, tissue, coco powder.** • **Jar/beaker, card with hole in, red, white and blue hole punched paper, cotton wool.** • **Stethoscopes (optional)** • **Stop watch.** • **Pulse metres or data loggers if you have them.**		• **Bread making ingredients: 100g strong white bread flour.** • **½ tsp dried, fast acting yeast.** • **Pinch of salt.** • **Pinch of sugar.** • **60ml lukewarm water**	• **Cup, pencil, water per pair/group.** • **Paper, pens, cup, water.** • **1p coin, class, water** • **Plastic bottles, pens, scissors, water.** • **Prisms, torches.** • **Container, mirror, blutack, water, torch.** • **Spray bottle or hose pipe** • **Sunshine.**
IMPACT		Can draw a diagram of the circulatory system, label the parts and annotate it to show what the parts do. Can explain the positive and negative effects on diet, exercise, drugs and lifestyle on the body.	Make circuits to solve particular problems e.g. how to make the door bell louder. Carry out fair tests exploring changes in circuits Make circuits that can be controlled. Understand electricity symbols and draw circuits. Understand how switches work. Understand electrical hazards. Understand how cells/batteries work. Understand voltage.	Can give examples of animals in the five vertebrate groups and some of the invertebrate groups. Can give key characteristics of the five vertebrate groups and some invertebrate groups. Can give examples of flowering and non-flowering plants. Can use classification keys to identify unknown plants and animals. Can create classification keys. Can give a number of characteristics that explain why an animal belongs to a particular group.	Can describe with diagrams how light travels in straight lines, either from sources or reflected from other objects into our eyes. Can describe with diagrams how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape.

INTENT	Content/ Knowledge	<u>Evolution and Inheritance</u> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
	Book/ Science Capital	 Darwin  Palaeontologist  The Molliebird
	Scientific Enquiry	Use scientific evidence to support or refute arguments. Explain research using scientific knowledge and understanding. Can identify patterns which can be found in natural environments. Draw conclusions when sorting and classifying. Can present findings in oral and written form using research. I can look for patterns when considering variation.
	Working Scientifically	Use ideas from secondary sources to explain ideas. Raise questions about a range of phenomena. Develop predictions which can be found in natural environments. Use scientific reasons to make overall comparisons. Use scientific diagrams to explain abstract concepts. Describe and evaluate my own and other people's scientific ideas
IMPLEMENTATION	Ideas/WOW moments.	1- Children consolidate work on fossils and how they are formed. Children make own fossil and explain the process. Children create a guide or poster. 2- Children will learn about Charles Darwin and natural selection. Discuss evolution of birds through seed investigation. 3- Read Molliebird and design own Molliebird based on the changing environments. Use sweets and raisons to demonstrate natural selection. 4- Discuss how plants are adapted to their environments. Sort plant cards according to how they adapt and evolve. 5- Children will focus on how animals are adapted to different climates. Read peppered moth to demonstrate modern evolution. Create a stop motion or leaflet to show how animals are adapted to its environment. 6- Explore genetics and how characteristics are passed down the generations. Children to analyse family trees and write an

IMPLEMENTATION		explanation for how the Weasley family tree has similar characteristics.
	Cross curricular links/opportunities	• **English**- create information poster and leaflet. Write coherent and detailed explanations. • **History**- looking at how animals and plants have evolved over time. Study of scientists in the past. • **IT**- stop motion technology. Use of video clips to help understand concepts. • **Maths**- measurements and timelines. Recording time.
	Resources needed to accompany the scheme	• Trundle wheel • Metre stick • Selection of fossils. • magnifying glasses • Tupperware container • Plasticine • Shells • Plaster of Paris • Water • Bread, shells, sweets • Chopsticks • Tweezers • Raisons or • Sunflower seeds • Two bowls • Stopwatch • Molliebird Book by Jules Pottle • Raisons and Smarties mixed in a bowl. • Large paper • Coloured pens • Ipad / tablet or camera for stop motion and computer software • Coloured wool. • Post it notes.
IMPACT		Can explain the process of evolution. Can give examples of how plants and animals are suited to their environment. Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth. Give examples of things that lived millions of years ago and the fossil evidence to support this. Can identify where offspring are not identical to their parents.