Science Long Term Plan Overview UKS2

Cycle C 2021/2022	Autumn		Spring		Summer	
Theme Title	**War and Remembrance**		**The Americas**		**The Romans**	
Science Study Title	**Light and Sound**	**Animals including humans (Year 6 circulatory system and health focus)**	**Living things (year 5) Life cycles**	**Science week focus and Climate change**	**Human Life Cycle /Changes and Reproduction**	**Living things (year 6 Classification focus)**
Key Vocabulary / Knowledge:	Revisit Y3/4 vocabulary. Primary and secondary light sources, convex, concave, lenses, refraction, diffraction, colour spectrum, UV. Timbre, pitch, volume and energy/ frequency.	Revisit Y3/4 vocabulary. Circulatory system, heart, blood, vessels, oxygenated and de-oxygenated. Factors effecting health, diets, nutrients.	Revisit Y3/4 vocabulary. Life cycles, types of animals, reproduction in plants and animals, asexual/ sexual. Food chains and webs	Climate change, greenhouse gases, temperature change, deforestation, pollution, renewables, interdependence, adaptation.	Conception, birth, growth, development, puberty, old age, death, reproduction, embryo, gestation.	Revisit Y3/4 vocabulary. Scientific diagrams and labels, classification keys, tables, scatter graphs, bar, line graphs and pie charts. Characteristics, micro-organisms, interdependency.
Overview / Enquiry	**Comparative tests** How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? Which material is most reflective? How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork affect the pitch of the sound?	**Comparative tests** How does the length of time we exercise for affect our heart rate? Which type of exercise has the greatest effect on our heart rate? **Identify & Classify** Which organs of the body make up the circulation system, and where are they found?	**Comparative tests** How does the level of salt affect how quickly brine shrimp hatch? **Identify & Classify** Compare this collection of animals based on similarities and differences in their lifecycle	**Research** Causes of climate change Focus on specific animals and places and how effected by climate change Research renewable energies and their advantages and disadvantages	**Comparative tests** How does age affect a human's reaction time? Who grows the fastest, girls or boys? **Identify & Classify** Can you identify all the stages in the human life cycle? **Observation over time**	**Comparative tests** Which is the most common invertebrate on our school playing field? **Identify & Classify** How would you make a classification key for vertebrates/ invertebrates or microorganisms? **TAPS planning ideas:**

	 **Identify & Classify** Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? **Other:** Designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. Which material is best to use for muffling sound in ear defenders?	 **Observation over time** How does my heart rate change over the day?  **Pattern Seeking** Is there a pattern between what we eat for breakfast and how fast we can run? **TAPS planning ideas:** Heart rate **Other ideas:** Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	**Observation over time** How do brine shrimp change over their lifetime?  **Pattern Seeking** Is there are relationship between number of petals and number of stamens?  **Research** What are the differences between the life cycle of an insect and a mammal? **TAPS planning ideas:** Life cycle research **Other ideas:** Try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest,		How do different animal embryos change?  **Pattern Seeking** Is there a relationship between a mammal's size and its gestation period?  **Research** Why do people get grey/white hair when they get older? **BIG Question – Assessment Opportunity** Why and how does the human body change over time? **TAPS planning ideas:** Human growth survey	Outdoor keys Invertebrate research **Other ideas:** Using classification systems and keys to identify some animals and plants in the immediate environment.

			in the oceans, in desert areas and in prehistoric times), They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.			
Objectives	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 Identify how sounds are made, associating some of them with something vibrating	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals	Research led unit	Describe the changes as humans develop from birth to old age. (birth, growth, development, reproduction, death). PSHE links (Respect Yourself Programme) Visitor with baby to come in for Q&A session? Pupils should be taught to draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. (PSHE links) Pupils could work scientifically by finding out and recording the length and mass of a baby as it grows. Children to sequence the human life from	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 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 increase (recap on missed unit in lockdown)				conception through to old age and death.	

Cycle D 2022/2023	**Autumn**		**Spring**		**Summer**	
Theme Title	**The Ancients (Indus Valley)**		**Water (Rivers)**		**British History**	
Science Study Title	**Earth and Space**	**Properties and Changes in Materials**	**Forces in Action**	**Classifying Organisms**	**Electricity and Circuits**	**Evolution and Inheritance**
Key Vocabulary / Knowledge:	Build on shadows knowledge from Y3/4. Solar system, planets, rotation, orbit, axes, poles, celestial bodies, seasons, hemisphere, astronomy.	Revisit Y3/4 vocabulary. Dissolving, properties, evaporation, soluble, insoluble, separation, filtration, solutions, sediment, saturation.	Revisit Y3/4 vocabulary. Gravity, air resistance, water resistance, gears, pulleys, levers, springs, cause and effect, momentum, acceleration.	Revisit Y3/4 vocabulary. Classification to include micro-organisms, interdependence, adaptations, decay, increase complex data systems.	Revisit Y3/4 vocabulary. Electric circuit in series, buzzer, cell, switch, bulb, component, power source, flow, voltage – cause and effect, complex circuits, circuit diagrams, parallel circuits,	Recap and recall habitat and adaptations work. Evolution, inheritance, Darwinism, genetics, time scales.
Overview / Enquiry						

	Comparative tests How does the length of daylight hours change in each season?  **Identify & Classify** How could you organise all the objects in the solar system into groups?  **Observation over time** Can you observe and identify all the phases in the cycle of the Moon?  **Pattern Seeking** Is there a pattern between the size of a planet and the time it takes to travel around the Sun?  **Research** What unusual objects did Jocelyn Bell Burnell discover? How do astronomers know what stars are made of? How have our ideas about the	**Comparative tests** How does the temperature of tea affect how long it takes for a sugar cube to dissolve? Which type of sugar dissolves the fastest?  **Identify & Classify** Can you group these materials based on whether they are transparent or not?  **Observation over time** How does a container of saltwater change over time? How does a sugar cube change as it is put in a glass of water?  **Pattern Seeking** Do all stretchy materials stretch in the same way? How does temperature affect how much solute we can dissolve?	**Comparative tests** How does the angle of launch affect how far a paper rocket will go? How does the surface area of an object affect the time it takes to sink?  **Identify & Classify** Can you label and name all the forces acting on the objects in each of these situations?  **Observation over time** How long does a pendulum swing for before it stops?  **Pattern Seeking** Do all objects fall through water in the same way? How does surface area of parachute affect the time it takes to fall?  **Research**	**Comparative tests** How does the temperature affect how much gas is produced by yeast? Which is the most common invertebrate on our school playing field?  **Identify & Classify** How would you make a classification key for vertebrates/invertebrates or microorganisms?  **Observation over time** What happens to a piece of bread if you leave it on the windowsill for two weeks?  **Pattern Seeking** Do all flowers have the same number of petals?  **Research**	**Comparative tests** How does the voltage of the batteries in a circuit affect the brightness of the lamp? How does the voltage of the batteries in a circuit affect the volume of the buzzer? Which make of battery lasts the longest? Which type of fruit makes the best fruity battery?  **Identify & Classify** How would you group electrical components and appliances based on what electricity makes them do?  **Observation over time** How does brightness of bulb change as the battery runs out? How can we measure how quickly a battery is used up?	**Comparative tests** What is the most common eye colour in our class?  **Identify & Classify** Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? Can you classify these observations into evidence for the idea of evolution, and evidence against?  **Observation over time** How has the skeleton of the horse changed over time?  **Pattern Seeking** Is there a pattern between the size and shape of a bird's beak and the food it will eat? 

	solar system changed over time? **BIG Question – Assessment Opportunity** Sun, Earth & Moon: What is moving and how do we know **TAPS planning ideas:** Craters Solar system research **Other ideas:** Comparing the time of day at different places on the Earth through internet links and direct communication Creating simple models of the solar system Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.	 **Research** What are microplastics and why are they harming the planet? **BIG Question – Assessment Opportunity** How can we separate a mixture of water, iron filings, salt and sand? **TAPS planning ideas:** Dissolving Nappy absorbency Insulating materials Zipline testing Sugar cubes Champion tapes Bridge engineers (or forces) **Other ideas:** Which type of sugar dissolves the fastest? Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains? They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for	How do submarines sink if they are full of air? **BIG Question – Assessment Opportunity** How and why do objects move? **TAPS planning ideas:** Paper planes Spinners Titanic pulleys Bottle flip Aquadynamic Marble run Bridge engineers (or materials) **Other ideas:** Which shape parachute takes the longest to fall? Which shoe is the most slippy? Exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. Explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.	What do different types of microorganisms do? Are they always harmful? **BIG Question – Assessment Opportunity** In what ways can we sort living things? **TAPS planning ideas:** Outdoor keys Invertebrate research **Other ideas:** Which is the most common invertebrate on our school playing field? Using classification systems and keys to identify some animals and plants in the immediate environment. Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.	 **Pattern Seeking** Does the temperature of a light bulb go up the longer it is on?  **Research** How has our understanding of electricity changed over time? **BIG Question – Assessment Opportunity** Can we vary the effects of electricity? **TAPS planning ideas:** Bulb brightness Conductive dough Terrific tasters **Other ideas:** Which make of battery lasts the longest? Systematically identifying the effect of changing one component at a time in a circuit Designing and making a set of traffic lights, a burglar alarm or some other useful circuit.	**Research** What happened when Charles Darwin visited the Galapagos islands? What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize? **BIG Question – Assessment Opportunity** What is evolution, how does it happen and how do scientists know? **TAPS planning ideas:** Fossil habitats Egg strength **Other ideas:** Observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a

		example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.				short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.
Objectives	Year 5 - describe the movement of the Earth, and other planets, relative to the Sun in the solar system Year 5 - describe the movement of the Moon relative to the Earth Year 5 - describe the Sun, Earth and Moon as approximately spherical bodies Year 5 - use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Year 5 - 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 Year 5 - Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Year 5 - Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Year 5 - Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday	Year 5 - Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Year 5 - Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Year 5 - Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	Year 6 - 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 Year 6 - Give reasons for classifying plants and animals based on specific characteristics	Year 6 - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Year 6 - 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 Year 6 - Use recognised symbols when representing a simple circuit in a diagram	Year 6 - Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Year 6 - Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Year 6 - Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

		materials, including metals, wood and plastic Year 5 - Demonstrate that dissolving, mixing and changes of state are reversible changes Year 5 - 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				

Cycle A 2023/2024	**Autumn**		**Spring**		**Summer**	
Theme Title	**Lights, Camera, Action**		**Poles Apart**		**The Olympics (France / Paris)**	
Science Study Title	**Light and Sound**	**Animals including humans (Year 6 circulatory system and health focus)**	**Living Things - Life Cycles (Y5)**	**Science week focus and Climate change**	**Changes and Reproduction**	**Living things (year 6 Classification focus)**
Key Vocabulary / Knowledge:	Primary and secondary light sources, convex, concave, lenses, refraction, diffraction, colour spectrum, UV. Timbre, pitch, volume and energy/frequency.	Revisit Y3/4 vocabulary. Circulatory system, heart, blood, vessels, oxygenated and de-oxygenated. Factors effecting health, diets, nutrients.	Revisit Y3/4 vocabulary. Life cycles, types of animals, reproduction in plants and animals, asexual/ sexual. Food chains and webs	Climate change, greenhouse gases, temperature change, deforestation, pollution, renewables, interdependence, adaptation.	Conception, birth, growth, development, puberty, old age, death, reproduction, embryo, gestation.	Revisit Y3/4 vocabulary. Scientific diagrams and labels, classification keys, tables, scatter graphs, bar, line graphs and pie charts. caracteristics, micro-organisms, interdependency.
Overview / Enquiry						

	Comparative tests How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork affect the pitch of the sound?  **Identify & Classify** Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? Which material is best to use for muffling sound in ear defenders?  **Observation over time**	**Comparative tests** How does the length of time we exercise for affect our heart rate? Which type of exercise has the greatest effect on our heart rate?  **Identify & Classify** Which organs of the body make up the circulation system, and where are they found?  **Observation over time** How does my heart rate change over the day?  **Pattern Seeking** Is there a pattern between what we eat for breakfast and how fast we can run? **TAPS planning ideas:** Heart rate **Other ideas:** Exploring the work of scientists and scientific research about the	**Comparative tests** How does the level of salt affect how quickly brine shrimp hatch?  **Identify & Classify** Compare this collection of animals based on similarities and differences in their lifecycle  **Observation over time** How do brine shrimp change over their lifetime? How does a bean change as it germinates?  **Pattern Seeking** Is there are relationship between number of petals and number of stamens?  **Research**	**Research** Causes of climate change Focus on specific animals and places and how effected by climate change Research renewable energies and their advantages and disadvantages	**Comparative tests** How does age affect a human's reaction time? Who grows the fastest, girls or boys?  **Identify & Classify** Can you identify all the stages in the human life cycle?  **Observation over time** How do different animal embryos change?  **Pattern Seeking** Is there a relationship between a mammal's size and its gestation period?  **Research** Why do people get grey/white hair when they get older? **BIG Question – Assessment Opportunity**	**Comparative tests** Which is the most common invertebrate on our school playing field?  **Identify & Classify** How would you make a classification key for vertebrates /invertebrates or microorganisms? **TAPS planning ideas:** Outdoor keys Invertebrate research **Other ideas:** Using classification systems and keys to identify some animals and plants in the immediate environment.

	Does the temperature of a light bulb go up the longer it is on? How does my shadow change over the day?  **Pattern Seeking** Is there a pattern to how bright it is in school over the day? And, if there is a pattern, is it the same in every classroom?  **Research** Why do some people need to wear glasses to see clearly? How do our eyes adapt to different conditions? **BIG Question – Assessment Opportunity** Why does my shadow change length over the course of a day? **TAPS planning ideas:** Light questions Investigating shadows **Other ideas:**	relationship between diet, exercise, drugs, lifestyle and health.	What are the differences between the life cycle of an insect and a mammal? **BIG Question – Assessment Opportunity** Do all plants and animals reproduce in the same way? **TAPS planning ideas:** Life cycle research **Other ideas:** Try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.		Why and how does the human body change over time? **TAPS planning ideas:** Human growth survey	

	Deciding where to place rear-view mirrors on cars Designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. Investigate the relationship between light sources, objects and shadows by using shadow puppets. Looking into rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur).					
Objectives	Year 6 - recognise that light appears to travel in straight lines Year 6 - 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 Year 6 - 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 Year 6 - use the idea that light travels in straight lines to explain why shadows have the same	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans	Year 5 - Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Year 5 - Describe the life process of reproduction in some plants and animals	Research led unit	Describe the changes as humans develop from birth to old age. (birth, growth, development, reproduction, death). PSHE links (Respect Yourself Programme) Visitor with baby to come in for Q&A session? Pupils should be taught to draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. (PSHE links)	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

	shape as the objects that cast them. IIdentify 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 increase.				Pupils could work scientifically by finding out and recording the length and mass of a baby as it grows. Children to sequence the human life from conception through to old age and death.	

Cycle B 2024/2025	**Autumn**		**Spring**		**Summer**	
Theme Title	**Life on Earth**		**Material Ages**		**Invaders**	
Science Study Title	**Earth and Space**	**Classifying Organisms**	**Properties and Changes in Materials**	**Electricity and Circuits**	**Forces in Action**	**Evolution and Inheritance**
Key Vocabulary / Knowledge:	Build on shadows knowledge from Y3/4. Solar system, planets, rotation, orbit, axes, poles, celestial bodies, seasons, hemisphere, astronomy	Revisit Y3/4 vocabulary. Classification to include micro-organisms, interdependence, adaptations, decay, increase complex data systems.	Revisit Y3/4 vocabulary. Dissolving, properties, evaporation, soluble, insoluble, separation, filtration, solutions, sediment, saturation.	Revisit Y3/4 vocabulary. Electric circuit in series, buzzer, cell, switch, bulb, component, power source, flow, voltage – cause and effect, complex circuits, circuit	Revisit Y3/4 vocabulary. Gravity, air resistance, water resistance, gears, pulleys, levers, springs, cause and effect, momentum, acceleration.	Recap and recall habitat and adaptations work. Evolution, inheritance, Darwinism, genetics, time scales.

				diagrams, parallel circuits,		
Overview / Enquiry	**Comparative tests** How does the length of daylight hours change in each season? **Identify & Classify** How could you organise all the objects in the solar system into groups? **Observation over time** Can you observe and identify all the phases in the cycle of the Moon? **Pattern Seeking** Is there a pattern between the size of a planet and the time it takes to travel around the Sun? **Research**	**Comparative tests** How does the temperature affect how much gas is produced by yeast? Which is the most common invertebrate on our school playing field? **Identify & Classify** How would you make a classification key for vertebrates/invertebrates or microorganisms? **Observation over time** What happens to a piece of bread if you leave it on the windowsill for two weeks? **Pattern Seeking** Do all flowers have the same number of petals?	**Comparative tests** How does the temperature of tea affect how long it takes for a sugar cube to dissolve? Which type of sugar dissolves the fastest? **Identify & Classify** Can you group these materials based on whether they are transparent or not? **Observation over time** How does a container of saltwater change over time? How does a sugar cube change as it is put in a glass of water? **Pattern Seeking**	**Comparative tests** How does the voltage of the batteries in a circuit affect the brightness of the lamp? How does the voltage of the batteries in a circuit affect the volume of the buzzer? Which make of battery lasts the longest? Which type of fruit makes the best fruity battery? **Identify & Classify** How would you group electrical components and appliances based on what electricity makes them do? **Observation over time** How does brightness of bulb change as the battery runs out?	**Comparative tests** How does the angle of launch affect how far a paper rocket will go? How does the surface area of an object affect the time it takes to sink? **Identify & Classify** Can you label and name all the forces acting on the objects in each of these situations? **Observation over time** How long does a pendulum swing for before it stops? **Pattern Seeking** Do all objects fall through water in the same way? How does surface area of parachute affect the time it takes to fall?	**Comparative tests** What is the most common eye colour in our class? **Identify & Classify** Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? Can you classify these observations into evidence for the idea of evolution, and evidence against? **Observation over time** How has the skeleton of the horse changed over time? **Pattern Seeking** Is there a pattern between the size and shape of a bird's beak

	What unusual objects did Jocelyn Bell Burnell discover? How do astronomers know what stars are made of? How have our ideas about the solar system changed over time? **BIG Question – Assessment Opportunity** Sun, Earth & Moon: What is moving and how do we know **TAPS planning ideas:** Craters Solar system research **Other ideas:** Comparing the time of day at different places on the Earth through internet links and direct communication Creating simple models of the solar system Constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day Finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.	 **Research** What do different types of microorganisms do? Are they always harmful? **BIG Question – Assessment Opportunity** In what ways can we sort living things? **TAPS planning ideas:** Outdoor keys Invertebrate research **Other ideas:** Which is the most common invertebrate on our school playing field? Using classification systems and keys to identify some animals and plants in the immediate environment. Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.	Do all stretchy materials stretch in the same way? How does temperature affect how much solute we can dissolve?  **Research** What are microplastics and why are they harming the planet? **BIG Question – Assessment Opportunity** How can we separate a mixture of water, iron filings, salt and sand? **TAPS planning ideas:** Dissolving Nappy absorbency Insulating materials Zipline testing Sugar cubes Champion tapes Bridge engineers (or forces) **Other ideas:** Which type of sugar dissolves the fastest? Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for	How can we measure how quickly a battery is used up?  **Pattern Seeking** Does the temperature of a light bulb go up the longer it is on?  **Research** How has our understanding of electricity changed over time? **BIG Question – Assessment Opportunity** Can we vary the effects of electricity? **TAPS planning ideas:** Bulb brightness Conductive dough Terrific tasters **Other ideas:** Which make of battery lasts the longest? Systematically identifying the effect of changing one component at a time in a circuit	 **Research** How do submarines sink if they are full of air? **BIG Question – Assessment Opportunity** How and why do objects move? **TAPS planning ideas:** Paper planes Spinners Titanic pulleys Bottle flip Aquadynamic Marble run Bridge engineers (or materials) **Other ideas:** Which shape parachute takes the longest to fall? Which shoe is the most slippy? Exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. Explore resistance in water by making and	and the food it will eat?  **Research** What happened when Charles Darwin visited the Galapagos islands? What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize? **BIG Question – Assessment Opportunity** What is evolution, how does it happen and how do scientists know? **TAPS planning ideas:** Fossil habitats Egg strength **Other ideas:** Observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels.

			making blackout curtains? They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	Designing and making a set of traffic lights, a burglar alarm or some other useful circuit.	testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.	They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.
Objectives	Year 5 - describe the movement of the Earth, and other planets, relative to the Sun in the solar system Year 5 - describe the movement of the Moon relative to the Earth Year 5 - describe the Sun, Earth and Moon as approximately spherical bodies Year 5 - use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Year 6 - 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 Year 6 - Give reasons for classifying plants and animals based on specific characteristics	Year 5 - 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 Year 5 - Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Year 5 - Use knowledge of solids, liquids and gases to decide how		Year 5 - Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Year 5 - Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Year 5 - Recognise that some mechanisms, including levers, pulleys and gears, allow a	Year 6 - Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Year 6 - Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Year 6 - Identify how animals and plants are adapted to suit their

	Year 6 - recognise that light appears to travel in straight lines Year 6 - 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 Year 6 - 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 Year 6 - use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them		mixtures might be separated, including through filtering, sieving and evaporating Year 5 - Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Year 5 - Demonstrate that dissolving, mixing and changes of state are reversible changes Year 5 - 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		smaller force to have a greater effect	environment in different ways and that adaptation may lead to evolution