



SARACENS
BELL LANE

YEAR 6 SCIENCE CURRICULUM MAP

	AUTUMN 1	Autumn 2	SPRING 1	Spring 2	SUMMER 1	SUMMER 2
Unit of Work National curriculum	Light	Electricity	Evolution and inheritance	Evolution and inheritance	Animals including humans	Living things and their habitats
Switched on Science	Topic 4 Light	Topic 5 Electricity	Topic 3 Evolution and inheritance	Topic 3 evolution and inheritance	Topic 2 Healthy bodies	Topic 1 Classifying living things
Substantive knowledge Key knowledge	<p>Recognise that light appears to travel in straight lines</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>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</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that</p>	<p>Find out more about how living things on earth have changed over time.</p> <p>Introduce the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles.</p> <p>Learn that variation in offspring over time can make animals more or less able to survive in</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in</p>

	<p>eyes or from light sources to objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions.</p>	<p>Use recognised symbols when representing a simple circuit in a diagram.</p> <p>Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.</p> <p>They should learn how to represent a simple circuit in a diagram using recognised symbols.</p> <p>Pupils should be taught to take the necessary precautions for working safely with electricity.</p>	<p>adaptation may lead to evolution.</p>	<p>particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox.</p> <p>Find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.</p>	<p>Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function.</p> <p>Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.</p>	<p>more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided.</p> <p>Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another.</p> <p>Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.</p>
--	--	---	--	--	---	--

Disciplinary knowledge

Working scientifically

Pupils might work scientifically by: 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. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur)

Pupils might work scientifically by: 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.

Pupils might work scientifically by: 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 two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

Pupils might work scientifically by: 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 two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

<p>Cultural Capital Scientists</p>	<p>Patricia Bath (BP website)- saving sight</p> <p>Thomas Young (Wave Theory of Light)</p> <p>Ibn al-Haytham - Light and our Eyes</p> <p>Percy Shaw - The Cats Eye</p> <p>Maria Telkes- Solar energy</p>	<p>Nikola Tesla -AC electric system</p> <p>Alessandro Volta- Electrical Battery</p> <p>Nicola Tesla- Alternating Currents</p> <p>Edith Clarke - Electrical engineer</p>	<p>Hippocrates -The Father of Medicine</p> <p>Charles Darwin- Evolution</p> <p>Alfred Russell Wallace – naturalist</p> <p>Rosalind Franklin – discovered the structure of DNA</p> <p>Nettie Stevens – Geneticist</p> <p>Professor Alice Roberts - Evolutionary biologist</p>	<p>Hippocrates -The Father of Medicine</p> <p>Charles Darwin- Evolution</p> <p>Alfred Russell Wallace – naturalist</p> <p>Rosalind Franklin – discovered the structure of DNA</p> <p>Nettie Stevens – Geneticist</p> <p>Professor Alice Roberts - Evolutionary biologist</p>	<p>Jamie Oliver</p> <p>Joe Wicks</p> <p>Leonardo Da Vinci- anatomy</p> <p>Santorio Santorio- Anatomist</p> <p>Dr. Katherine Dibb – Expert in Cardiovascular Sciences</p> <p>Justus von Liebig- Theories of Nutrition and Metabolism</p> <p>Sir Richard Doll- Linking Smoking and Health Problems</p>	<p>Libby Hyman Classification Invertebrates</p> <p>Edward Jenner, Carl Linnaeus – pioneer of classification</p>
<p>Suggestions for school visits</p>			<p>Natural History Museum</p>	<p>Natural History Museum</p>		

Teacher CPD links	Resources - Google Docs https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425618/PRIMARY_national_curriculum_-_Science.pdf	https://www.reachoutcpd.com PLAN Progression - Staff Drive - Google Drive	https://my.risingstars-uk.com/CourseHome.aspx?csid=9781510446151	https://classroom.thenational.academy/subjects-by-key-stage	Science - Staff Drive - Google Drive Science - Staff Drive - Google Drive	https://www.stem.org.uk/primary-science
--------------------------	--	--	---	---	--	---

Year 6 - Light

		<p>Pupils previously learnt:</p> <ul style="list-style-type: none"> - Yr 5: Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. - • Describe the movement of the Moon relative to the Earth. - • Describe the Sun, Earth and Moon as approximately spherical bodies. 	
--	--	---	--

		<ul style="list-style-type: none"> • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 		
Lesson number	Lesson question	Pupils will learn		Key Vocabulary
		Substantive knowledge	Disciplinary knowledge	
1	Rising stars assessment Front cover (KWL) Knowledge organiser	Teacher assessment		
2	What is light and how does it travel?	<ul style="list-style-type: none"> • Define light and dark • Describe different light sources • Investigate how light travels 	Sorting Exploration	Light, light source, dark, absence of light, Straight line
3	How do we see light?	<ul style="list-style-type: none"> • Name the parts of the eye • Describe how the lenses in glasses work 	Modelling	Light, light source, dark, absence of light, lense
4	Where do different colours come from?	<ul style="list-style-type: none"> • How white light is split into different colours • Primary and secondary colours of light • How a rainbow is made 		Spectrum Absorb, reflect Wave length Wave length Frequency

5.	What is reflection and how can we use it?	<ul style="list-style-type: none"> • What happens to light when it is reflected • Describe different types and uses of reflection • Investigating mirrors. 	Explore	transparent, translucent, opaque, shiny, matt, surface, shadow, reflect,
6.	Investigating different types of mirrors. What are their uses?	<ul style="list-style-type: none"> • Define what a convex and concave mirror is. • Identify the different uses of mirrors. 	Explore	Concave Convex Surface Curved Outwards Inwards Wider Enlarge
7	What is refraction and how can we use it?	<ul style="list-style-type: none"> • What happens to light when it refracts • Identify whether reflection or refraction has taken place 	Explore	Light, light source, dark, absence of light, Wave length
8	What factors affect the size, shape or type of shadow?	<ul style="list-style-type: none"> • Plan and carry out a fair test • Use results to write a conclusion. 	Plan a fair test. Write a conclusion.	Light source Light Shadow Block Opaque Translucent Transparent
9	What are some uses of light?	<ul style="list-style-type: none"> • Build a shadow puppet theatre • How does a periscope or 	Model Research	Light Light course Reflect

		kaleidoscope work? • How different types of lenses work		Images
10	Who invented the concept of cats eyes?	• What is Percy Shaw famous for? • Investigate how do cats' eyes work? • Which animals' eyes do or do not glow in the dark?	Research	Reflect Light source
11	Cultural Capital Visitor, visit, scientist			
12	Rising Stars end of unit assessment	Teacher to identify any gaps and plan recap		

Year 6- Electricity

		Pupils previously learnt:	
--	--	----------------------------------	--

		<ul style="list-style-type: none"> - Yr 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. 		
Lesson number	Lesson question	Pupils will learn		Key Vocabulary
		Substantive knowledge	Disciplinary knowledge	
1	Rising stars assessment Front cover (KWL) Knowledge organiser	Teacher assessment		
2/ 3	What are the different components in an electrical circuit?	<ul style="list-style-type: none"> • Describe the parts of an electrical circuit and the symbols they are represented by. • Explain how electricity in a circuit is different to static electricity • State the conditions for electricity to flow in a circuit. (conductor and insulator exp) 	Comparative testing Predict Conclude	Components Flow Break Circuit
4	Will the circuit work?	<ul style="list-style-type: none"> • Identify if a circuit will work. 	Predict Explore Conclude	Components Flow Break Circuit
5	What happens in a circuit when we change the components?	<ul style="list-style-type: none"> • Ask questions that can be answered using a fair test. • Plan a fair test. • Can write a prediction for what will happen when we change the components in a circuit 	Asking questions Planning	Enquiries Variables Fair test Comparative test Components Flow

				Break Circuit
6	What happens in a circuit when we change the components?	<ul style="list-style-type: none"> Carry out an investigation to test your prediction Evaluate whether your prediction was correct or not using your results 	Fair test Comparative test	Enquiries Variables Fair test Comparative test Components Flow Break Circuit
7	What is the difference between a series and parallel circuit?	<ul style="list-style-type: none"> Explain the difference between a series and parallel circuit. Identify the two types of circuits. Identify uses of the two types of circuits. 	Explore Predict	Series circuit Parallel circuit Flow Components Break Switch Current
8	Design an electrical game.	<ul style="list-style-type: none"> Design a game that uses a circuit. Evaluate the design and suggest improvements. 	modelling	Design Test Evaluate Series circuit Parallel circuit Flow Components Break Switch Current
9	Cultural Capital			

	Visitor, visit, scientist			
10	Rising Stars end of unit assessment	Teacher to identify any gaps and plan recap		

Year 6- Evolution and Inheritance

		Pupils previously learnt: - Yr 3: Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks)		
Lesson number	Lesson question	Pupils will learn		Key Vocabulary
		Substantive knowledge	Disciplinary knowledge	
1	Rising stars assessment Front cover (KWL) Knowledge organiser	Teacher assessment		
2	What are fossils and how are they formed?	<ul style="list-style-type: none"> What a fossil is and how it is made What fossils show us about changes in species over time 	Mod'elling	Sediment Palaeontologist excavate
2	What is the Theory of Evolution? How does it help explain	<ul style="list-style-type: none"> How random changes in characteristics can lead to an advantage in an organism 	Research Conclusion	vary, characteristics, suited, adapted,

	adaptation?	<ul style="list-style-type: none"> • How the survival of these organisms leads to evolution • How Charles Darwin came up with the theory of evolution 		environment,
3	Which organisms lived during each era of time?	<ul style="list-style-type: none"> • Which groups of organisms existed in each period • The reasons why some organisms became extinct 	Research	vary, characteristics, suited, adapted, environment, Extinct
4	How do animals survive in changing habitats during winter?	<ul style="list-style-type: none"> • What are the different types of hibernations? • How do animals survive in winter? • What adaptations do animals undergo to survive in winter? 	Research	Adaptation Suited Environment Hibernation
5	How do animals survive during summer?	<ul style="list-style-type: none"> • How do animals survive in summer? • What adaptations do animals undergo to survive in summer? • Adaptation may lead to evolution. 	Research	Adaptation Suited Environment Hibernation
6	What are traits? How do we know that traits are inherited? How are offspring similar and dissimilar to their parents?	<ul style="list-style-type: none"> • living things produce offspring of the same kind • offspring vary and are not identical to their parents 	Sorting Data collection conclusion	Heredity Offspring
7	Cultural Capital Visitor, visit or scientist			

8	Rising Stars end of unit assessment	Teacher to identify any gaps and plan recap		
---	-------------------------------------	---	--	--

Year 6- Animals Including Humans

		Pupils previously learnt: <ul style="list-style-type: none"> - Yr5: Describe the changes as humans develop to old age. - • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) - • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) 		
Lesson number	Lesson question	Pupils will learn		Key Vocabulary
		Substantive knowledge	Disciplinary knowledge	
1	Rising stars assessment Front cover (KWL) Knowledge organiser	Teacher assessment		
2	What are the main parts of the human circulatory system?	<ul style="list-style-type: none"> • What are the functions of the heart, blood and blood vessels in the human circulatory system? 	Modelling	Heart Lungs Exchange Gases Arteries Veins

3	<p>What is pulse rate and what are the factors that affect it?</p> <p>Does it take a shorter time for the pulse to get back to normal in younger people?</p> <p>Does the resting pulse rate change with age?</p>	<ul style="list-style-type: none"> • How can the factors affecting the pulse rate be investigated? 	Comparative test	<p>Heart</p> <p>Lungs</p> <p>Exchange</p> <p>Gases</p> <p>Arteries</p> <p>Veins</p>
4	Do men/boys have a different resting pulse rate than women?	<ul style="list-style-type: none"> • Compare the effect of different factors on human pulse rate. 	Comparative test	<p>Resting pulse</p> <p>Blood pressure</p>
5	What is the impact of diet, exercise, drugs and lifestyle on the way their bodies function?	<ul style="list-style-type: none"> • Know the importance of good diet • To be able to explain the impact of drugs and wrong lifestyle on the human body. 	<p>Comparative test</p> <p>Research</p>	<p>diet,</p> <p>exercise,</p> <p>drugs,</p> <p>lifestyle</p>
6	How are nutrients and water transported within humans?	<ul style="list-style-type: none"> • 		<p>Nutrients</p> <p>Exchange</p>
7	<p>Cultural Capital</p> <p>Visit, visitor, scientist</p>			
8	Rising Stars end of unit assessment	Teacher to identify any gaps and plan recap		

Year 6 - Living things and their habitats

		Pupils previously learnt: <ul style="list-style-type: none"> - Yr 5: 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. 		
Lesson number	Lesson question	Pupils will learn		Key Vocabulary
		Substantive knowledge	Disciplinary knowledge	
1	Rising stars assessment Front cover (KWL) Knowledge organiser	Teacher assessment		
2	What are the main animal groups and what are their main features? (recap from Yr 5)	<ul style="list-style-type: none"> • To be able to classify and identify animals based on their characteristics. 	Sort classify	Mammals Fish Amphibians Reptiles Vertebrate Invertebrates
3	How can invertebrates be classified? Activity 1 Quick classifications	<ul style="list-style-type: none"> • To be able to identify main features of invertebrates. 	Research	Invertebrates, insects, spiders, snails, worms,
4	Activity 2 Classifying the local			

	environment			
5	How are plants classified?	<ul style="list-style-type: none"> To be able to name and classify plants into two main groups. 	Research	flowering, non-flowering
6	CARL LINNAEUS			
7	Bacteria			
8	Fabulous fungi			
9	Cultural Capital Visit, visitor, scientist			
10	Rising Stars end of unit assessment	Teacher to identify any gaps and plan recap		

Optional units

Year 6- History of Science

		Pupils previously learnt: <ul style="list-style-type: none"> Yr 5: Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. 		
Lesson number	Lesson question	Pupils will learn		Key Vocabulary
		Substantive knowledge	Disciplinary knowledge	

1.	How do scientific ideas change?	<ul style="list-style-type: none"> Describe the scientific process How scientific ideas are challenged in science How knowledge builds over time - using sound and the invention of the iphone as an example 	Research Sorting Comparing	Scientific process Data / evidence Hypothesis /predict Cumulative Peer review Debate Collaboration
2.	How has our understanding and use of electricity developed?	<ul style="list-style-type: none"> Timeline of major discoveries and inventions in relation to electricity Describe the contributions of Lewis Howard Latimer, Michael Faraday and Mildred Dresselhaus to our understanding of electricity 	Research Sorting	Electricity Static electricity Battery Filament Chronological
3.	How has human use of materials changed over time?	<ul style="list-style-type: none"> Timeline of material use Compare raw vs synthetic materials Debate whether humans have changed materials or have materials changed humans? 	Research Sorting Conclusion	Material Natural Synthetic Nano material Debate Metal Stone age Bronze age
4.	How has our understanding of the human body changed over time?	<ul style="list-style-type: none"> Timeline of our understanding of human anatomy How increased knowledge of our anatomy has led to medical advances Describe the role of Charles Drew in the development of blood banks 	Comparative testing Research Conclusion	Anatomy Dissection Microscope Blood Surgery Tourniquets Transfusion Blood analysis Trephining
5.	How has the discovery of DNA	<ul style="list-style-type: none"> Describe what DNA is 	Explore (isolating DNA from	DNA/ double helix

	changed science?	<ul style="list-style-type: none"> • Story of the discovery of DNA • Scientific developments as a result of the discovery of DNA 	onion cells)	Inherited disease Cell Treatment cure
6.	How have our ideas about the universe changed over time?	<ul style="list-style-type: none"> • Compare the geocentric and heliocentric models • Describe elliptical orbit 	Research	Universe Geocentric Model Heliocentric model Orbit / elliptical paths Sun Planets

Switched on science

Topic 6 - The Titanic