

YEAR 6

AUTUMN 1

TERM	AUTUMN 1
Term Thread	Africa and Ancient Egypt
"EXPLORE" for ½ term (trip, visitor, experience)	Ancient Egyptian Artefacts and samples of cuneiform tablets from Manchester Museum (possibly with the inflatable)
Breadth of Study	BIOLOGY
Threshold Concept	Investigate Living Things- Adaption and Evolution
Key person/people	
LINK	Across this term and in fact the whole year we will be investigating civilisations and ancient history. Civilisation grew because there was something about the environment where early settlements began that led to them succeeding and growing. During this term we will focus on the African civilisation we know as Ancient Egypt. To help us gain a better understanding we will be working as Scientists. As Scientists, we will explore the way living things change and the way animals (that includes us humans!) change (adapt) to suit their environment over long periods of time. This process is called evolution. The first humans and all of our ancestors evolved in Africa.
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Development of Knowledge and Skills</p> <p>Lesson 1: Revisit fossils from Year 3. Ask what is a fossil and how are they made? Can anyone recall? Discussion. Watch the short film clip showing the formation of a fossil and compare it to what they remember. (Note: current Year 6 may have done this as it was National curriculum, but some won't) https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3 briefly record how fossils are formed. Fossils have been incredibly important in helping us understand how living things have changed over time. Fossils provide information about living things that inhabited the Earth millions of years ago. Due to fossil evidence we know that humans evolved in Africa before spreading all over the planet. Fossils help explain how all living things evolved. What is evolution? Watch https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/z9qs4qt</p> <p>The first person who explained how evolution happens was Charles Darwin with his scientific theory of natural selection. Some of Darwin's ideas were built on the work of an East-African Islamic scholar Al-Jahiz. Al-Jahiz wrote many books including one nearly 1000 years before Charles Darwin was born. It was called 'The Book of Animals' and in it Al Jahiz who observed that parents pass on traits to their children and some traits mean animals and species survive. (Note: for teachers information https://www.theguardian.com/commentisfree/belief/2009/feb/27/islam-religion-evolution-science) Record learning.</p> <p>Lesson 2: Recap evolution and the way fossils provide us with evidence.</p> <p><u>Adaption:</u> Living things are adapted to their habitats. This means that they have special features that help them to survive. An African elephant, for example, lives in a hot habitat and has very large ears that it flaps to keep cool. A polar bear, on the other hand, lives in a cold habitat and has thick fur to keep warm. Watch https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/zxg7y4j As a class create a short paragraph which describes adaption.</p> <p><u>Inheritance:</u> When living things reproduce, they pass on characteristics to their offspring. This is known as inheritance. You've probably noticed that you might look like your parents. This is because you inherit key characteristics from them, like your eye colour, skin colour and height (Note: be sensitive to any pupils who do not live with or know their biological parents). Watch https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/zp9f4qt As a class create a short paragraph which describes inheritance including the traits that we pass on (skin/eye colour etc.)</p> <p>Lesson 3: Fossils can provide fantastic information, but can be difficult to see, parts of the fossil record are missing as they haven't been found yet. Fortunately we don't just have to rely on fossils as evidence for evolution. Because larger mammals (like us) take a longer to reach maturity when they can have offspring and pass on their genes, the evolution of more complex animals is incredibly slow. It takes place over hundreds of thousands of years. However because insects reach maturity a lot faster it is easier to observe evolutionary change. There is a brilliant example of evolutionary change that occurred here in Manchester. Last half term we studied the Industrial Revolution. Because the environment in Manchester changed there is evidence of evolutionary change. Have a look at Manchester's peppered moth story watch https://www.youtube.com/watch?v=Pop-xetGaBM (Note: be ready to stop the film at 3.03 and ask the pupils to predict what they think might have happened). Use a flow chart explain how the moth adapted to the change in its environment and changed back again after the clean air act.</p> <p>Check back over the past three lessons and ensure you have notes on the following:</p> <p><u>Adaptation</u> - How living things are specialised to suit their environment. <u>Evolution</u> - The process by which living things can gradually change over time. <u>Inheritance</u> - The process of passing on features from parents to offspring. <u>Species</u> - A group of living things with very similar characteristics. They can breed together to make more living things of the same type. <u>Variation</u> - The differences between living things in a species. If you are unsure about any of these terms talk with others in your class.</p>
Milestones	<ul style="list-style-type: none"> • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

YEAR 6: continued

TERM	AUTUMN 1
Term Thread	Africa and Ancient Egypt
"EXPLORE' for ½ term (trip, visitor, experience)	Bolton Museum Ancient Egyptian collection
Breadth of Study	BIOLOGY
Threshold Concept	Investigating living things *Characteristics and classification
Key person/people	
LINK	We began the term by investigating evolution and change of life on Earth. We will continue to work as Scientists to explore the way life on our planet can be sorted into groups to help us better understand it. This is called classification.
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Development of Knowledge and Skills</p> <p>Lesson 1: Revisit characteristics and classification. Animal characteristics work from Milestone 2 including – focus on vertebrates. Ask the class to recall the five classes – mammals, birds, fish, reptiles, amphibians. Ask pupils to sort pictures of the following African animals into the 5 classes: Lion, giraffe, flamingo, ostrich, Nile perch, great white shark, crocodile, leopard tortoise, long toed tree frog and African bullfrog. Time them as this should take seconds! Ask why they put them in these categories? (Note: most would just be able to tell where they belonged without thinking about it) Watch this clip about the characteristics of each animal classification. Watch - Classification of animals Biology – Life Lessons https://www.youtube.com/watch?v=ITrRMiQB8g4.</p> <p>Use information in the film and own knowledge to record key characteristics of each class of animal. For example under the heading of fish pupils might write – Lives in water, cold blooded, breathes using gills, has scales and fins, lays eggs. Work as a class to ensure all pupils have key characteristics for each.</p> <p>Lesson 2: Explore classification and characteristics of Invertebrates. What invertebrates do we know? Make a list. Explain that just like the way there are different groups of vertebrate there are also different groups of invertebrate.</p> <p>Watch https://www.youtube.com/watch?v=dWMYZMWe9aA (or something similar) for an introduction to the main groups (there are several more but they do not need so much detail). Arthropods, molluscs, worms, sponges, cnidarians, echinoderms. Use information provided and pictures to complete a table with pictures and examples of each. Focus on arthropods- they break down into smaller groups including: insects, myriapods (including centipedes and millipedes), arachnids (including spiders, mites and scorpions), and crustaceans (including slaters, prawn and crabs). Record basic characteristics for each with examples.</p> <p>Lesson 3: Plant classification and characteristics. All life on earth can be classified and grouped this includes plants. Explore plant classification looking at a plant classification key. Split into plants that grow seeds and plants that do not grow seeds. Look at examples of plants that grow flowers and do not grow flowers etc.– mosses ferns, conifers, grasses and flowering plants write descriptions, with diagram/ photographs.</p> <p style="text-align: center;">End lesson with brief introduction to Carl Linnaeus- watch https://www.youtube.com/watch?v=-LVunuLOT4w</p>
Milestones	<ul style="list-style-type: none"> • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Recap the life process of reproduction in some plants and animal

YEAR 6

AUTUMN 2

TERM	AUTUMN 2
Term Thread	Africa and Ancient Egypt
"EXPLORE" for ½ term (trip, visitor, experience)	Ancient Egyptian Artefacts and samples of cuneiform tablets from Manchester Museum (possibly with the inflatable)
Breadth of Study	BIOLOGY
Threshold Concept	Investigate Living Things- Adaption and Evolution
Key person/people	
LINK	Last half term we began exploring ancient Egypt, countries in modern Africa and took inspiration from African civilisations and arts. We learn how cultures and civilisations begin, grew and adapted. We are going to continue our work as Scientists as we revisit and apply our knowledge and skills exploring evolution
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Application of Knowledge and Skills</p> <p>Lesson 1: Fill in a step-by-step guide showing the formation of a fossil. Challenge – Watch this clip about the evolutionary adaption in giraffes https://www.bbc.co.uk/bitesize/clips/zwcg9j6 For a very long time people have speculated how the early giraffe went from having a stubby neck to all giraffes having extra-long necks. Giraffes with the extra longneck had an evolutionary advantage because they could reach higher leaves. This meant that they could eat more and meant they were likely to live long enough to reach adult hood where they would breed and pass on the longneck traits to their children. Their children would then pass the longneck on to their children and so on. There is now fossil evidence to back this hypothesis up. Have a look at the fossil evidence where early giraffes had vertebrae (Link back to year 3 skeletons and vertebrates and invertebrates) which are shorter and then we have giraffes with longer vertebrae over hundreds of thousands of years. (Note: see https://cdn.mos.cms.futurecdn.net/pHRHLKvmgBteoHCfZx5tQa.jpg https://cdn.mos.cms.futurecdn.net/nBpHH2x8Apy56JxShkXxiP.jpg and for good visuals and https://www.livescience.com/52903-transitional-giraffe-fossils.html for your information). Make a step-by-step guide to explain to a younger child the evolutionary process of how giraffe species went from having a short neck to a long neck. You may want to create a flow chart like we used on the peppered moth story. Ensure that the child you are informing, understands that this process of passing on this evolutionary advantage happened over a very, very long time.</p> <p>Lesson 2: Revisit offspring, variation and inheritance. Use the Mr. Men/ Little Miss activity (Note: see https://primarilyscience.co.uk/wp-content/uploads/2019/05/prisci-post-20-Whos-the-dad.pdf for an example) Work on an example as a class then provide each table a different set of Mr Men and Little Miss characters. Ask the pupil to draw pictures of what they predict their offspring might look like based in inherited traits such as eye, skin and hair colour, hair type, size and shape (height). Pupils must explain their choices and variations.</p> <p>Lesson 3: Revisit adaption and environmental evolution. Provide each table with a different habitat. They are challenged to create the perfect creature for their particular environment Use plasticine to make a model of your creature or make 2D designs- Present your creature to the class explaining its features and how they have evolved to suit the environment.</p>
Milestones	<ul style="list-style-type: none"> • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago <ul style="list-style-type: none"> • 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.

YEAR 6: continued

TERM	AUTUMN 2
Term Thread	Africa and Ancient Egypt
"EXPLORE' for ½ term (trip, visitor, experience)	Bolton Museum Ancient Egyptian collection
Breadth of Study	BIOLOGY
Threshold Concept	Investigating living things *Characteristics and classification
Key person/people	
LINK	As scientists they were looking at how some traits are passed on from parents or to our offspring. This can include things like skin I and hair colour. Darwin and his work on understanding evolution made huge leaps in our understanding of the living world. Tragically some scientists took this work and decided to apply it to humans and try and justify racism. They tried to show that people who had white skin and were from specific countries in Europe, were superior to everybody else. This was a way of justifying the cruelty and inhumanity of slavery and to justify going to other countries and stealing their wealth. These so-called scientists developed a kind of science called eugenics. This is where they would classify people into races and rank them with white Eur opeans at the top. This is completely untrue and fortunately we understand that there is no actual science to back up these horrible ideas. We know Homo sapiens have variations in skin colour eye colour and hair texture, but we know we are all one human species. We no longer think to classify people in these horrible and incorrect ways, but we can classify different species of animal and plants. We will now go back to the work we were doing on classification and apply and knowledge and skills.
No. of lessons	3
UNIT CONTENT	Application of Knowledge and Skills lesson 1: Revisit Learning from previous half term. List examples of animals which fall into the category of invertebrates. Sort these into Arthropods, molluscs, worms, sponges, cnidarians, echinoderms. Revisit the four main examples of arthropods sort a range of animals into arthropods, molluscs, worms, sponges, cnidarians, echinoderms explain your choices by out lining the characteristics. Create your own classification keys for animals or your choice. Swap them with others in the class to test if they get the same results. Lesson 2 Revisit plant classification. Using real plants and ask the pupils to attempt to classify them (provide examples such as a cactus, small conifer, a fern and mosses) have one plant specimen for each table. Pupils explore the plants teams and attempt to classify and eventually name them. Ask them to record how they reached their conclusions. Pupils can work in pairs or individually. Lesson 3: Create a fact file about Carl Linnaeus and how his classification system, known as taxonomy, was so helpful to help determine what an organism anywhere in the world.
Milestones	<ul style="list-style-type: none"> • describe how living things are classified into broad groups according to common observable characteristics and based on sim ilarities and differences, including microorganisms, plants and animals <ul style="list-style-type: none"> • give reasons for classifying plants and animals based on specific characteristics • describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Recap the life process of reproduction in some plants and animal

YEAR 6

TERM	SPRING 1
Term Thread	Ancient Greece
EXPLORE' for ½ term (trip, visitor, experience)	Greeks, Gods and Art and Architecture tour at Manchester Art Gallery
Breadth of Study	PHYSICS
Threshold Concept	Understand Electrical Circuits Voltage and Circuit Diagrams
Key Person/people	
LINK	<p>Last term we looked at the earliest civilisations with the focus on Ancient Egypt. Ancient Egypt was invaded by a newer civilisation. The Ancient Greeks. This term we will be learning about the Ancient Greeks, their ideas about science, learning, and how to run things. We will also learn that some of their ideas and language are still used by us today. Whenever one civilisation developed it would take ideas from other places and take them further. The ancient Egyptians used wind and waterpower (link back to year 5 DT). The Ancient Greeks also used wind and water to power machinery such as mills for grinding grains into flour for bread. The Ancient Greeks used wind and water to power things as they could not make and use electricity like we do today.</p> <p>The Ancient Greeks had observed static electricity but did not understand how it could be used. Static electricity was first discovered about 2 500 years ago. The Greek scientist Thales of Miletus (c. 620 BCE – c. 546 BC) noticed that a piece of amber (the hard, fossilized sap from trees) attracted straw and feathers when he rubbed it with a cloth. The word “electricity” comes from the Greek word for amber – “elektron”. We are going to work as Scientists to develop our understanding of electricity.</p>
No. of lessons	6
UNIT CONTENT	<p style="text-align: center;">Development of Knowledge and Skills</p> <p>Lesson 1- Static electricity ancient Greeks experiments with amber. What is Amber? (link back to work on fossils in Year 3) The root of words like electricity, electronic, and electrostatic is the ancient Greek word ‘elektron’, meaning amber.</p> <p>The Greeks used pieces of amber in jewellery. They noticed that when amber was rubbed with cloth, it attracted light objects such as hair. The amber could pick these things up off the ground, despite the gravitational forces pulling them down (link back to Year 5 Spring 1 Science). It seemed natural to the Greeks to link this behaviour to the amber. After that, anything what acted in this way was linked to amber ‘elektron’. This was an example of static electricity. Write up the origin of the word electricity. Watch this clip about static electricity (clip currently being filmed)</p> <p>Investigations with static electricity- move a stream of water with a charged balloon, pick up pieces of paper with a plastic ruler you have rubbed with a cloth., roll a drins can after charging a plastic rod etc.</p> <p style="text-align: center;">Lesson 2- Revision of Circuits from milestone 2 (year 4)</p> <p style="text-align: center;">Lesson 3- Revision on conductors and insulators from milestone 2 (year 4)</p> <p>Lesson 4- What is voltage? How effect does higher and lower voltages have in light bulbs? Watch https://www.bbc.co.uk/bitesize/clips/z6qd7ty . What effect might different voltages have to how loudly a buzzer in a might sound?</p> <p style="text-align: center;">Lesson 5- Causes of further variations to the performance of circuits.</p> <p>Lesson 6- What do different symbols represent in circuit diagrams? A circuit always has a battery (cell) but it can also contain other electrical components, such as bulbs, buzzers and motors. When drawing circuit diagrams, rather than drawing detailed components, we use simple symbols to represent the different components. Follow this link to watch a clip and see all the symbols. Draw and label all the symbols.</p>
Milestones	<ul style="list-style-type: none"> • Recap conductors and insulators from Y4. • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram.

YEAR 6

TERM	SPRING 2
Term Thread	Ancient Greece
EXPLORE' for ½ term (trip, visitor, experience)	Democracy and Debate teams on 'what is worse?' - and/or meet a local politician Eventually at Manchester Town Hall
Breadth of Study	PHYSICS
Threshold Concept	Understand Electrical Circuits Voltage and Circuit Diagrams
Key Person/people	
LINK	In history last half term, we began to explore the ancient Greeks. One of the ways the ancient Greeks still influence us is when doctors swear the Hippocratic oath to do no harm. We will be working with basic medical care or first aid. We will end the unit looking at the dangers of electricity and what to do to help people who have had an electric shock. We also talked about the way many Greek words have influenced our own language such as democracy, and of course the word electricity has its origins in Ancient Greece we will now carry on working as Scientists to continue to explore electricity. We will be using electric lighting when we perform with our shadow puppet, we will be creating in Design Technology this term later this term
No. of lessons	6
UNIT CONTENT	<p style="text-align: center;">Application of Knowledge and Skills</p> <p>Lesson 1-Revise Static electricity and watch this clip https://www.youtube.com/watch?v=jLgSXryMxwM In small groups, experiment using balloons and tin cans with static electricity. In your groups design a simple game demonstrating how positive and negative charges attract each other using tissue paper and other scrap materials.</p> <p>Lesson 2: Construct your game. Demonstrate your game and explain what is happening</p> <p>Lesson 3- Revision on the effects of Voltage from previous half term.</p> <p>Lesson 3- Work in teams to create your own circuit with switches, buzzer and bulb. Observe what happens when there are more items added that the voltage can cope with. What are the maximum electric components the voltage can power?</p> <p>Lesson 4- Draw a diagram of your circuits created in lesson 3 with symbols explain if they worked or not.</p> <p>Lesson 5: What else can go wrong with a circuit? Looking at examples of circuits with faults and label and identifying reasons why they would not work.</p> <p>Lesson 6: Mains Power and the dangers of electricity. What to do if you find someone having an electric shock? Basic safety and first aid. Revise conductors and select which objects could and could not be used to free someone having an electric shock (dependent if they are made of materials which are conductors or insulators.</p>
Milestones	<ul style="list-style-type: none"> • Recap conductors and insulators from Y4. • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram.

YEAR 6

TERM	SUMMER 1
Term Thread	The Islamic Golden Age and The House of Wisdom
EXPLORE' for ½ term (trip, visitor, experience)	Visit the New South-East Asian exhibition at Manchester Museum when it opens. (in the meantime complete 'heart start' training with first aid and CPR)
Breadth of Study	BIOLOGY
Threshold Concept	Understand animals and humans - Circulatory system, health and lifestyle
Key Person/people	
LINK	Last term we learnt about the Ancient Greek Civilisation including the development of democracy and philosophical ideas. This term we are going to be learning about another civilisation, the early Islamic civilisation, specifically the 'Islamic Golden Age' which was a time of great learning and developments of scientific understanding. One area that really developed during the Golden Age of Islam was medicine and how the body worked. Ibn Sina became known as 'The Father of Modern Medicine' and wrote a medical textbook, which was still used by doctors hundreds of years after his death. Another important scientist working to understand the human body was Ibn Al-Nafis. He was the first to understand and explain how blood travels around the body. We are going to begin our term's work as Scientists to understand what our heart and blood does. Scientists, beginning with Ibn Al-Nafis, call this the circulatory system
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Development of Learning and Skills</p> <p>Lesson 1: https://www.bbc.co.uk/teach/class-clips-video/science-ks2-how-our-circulatory-system-keeps-us-alive/zhf76v4 - explains circulatory system and why we have it.</p> <p>What is the circulatory system? Watch and read https://www.bbc.co.uk/bitesize/topics/zwdr6yc/articles/zs8f8mn</p> <p>Create a title double page spread outlining the role of the circulatory system the transportation of nutrients water and oxygen include diagrams. What is the function of the heart? Record learning</p> <p>Lesson 2: What is blood and what does it do? Watch and read... https://www.bbc.co.uk/bitesize/topics/zwdr6yc/articles/zqv4cwxi</p> <p>What are blood vessels Watch and read... https://www.bbc.co.uk/bitesize/topics/zwdr6yc/articles/zw8xb82 for information on blood vessels. Look at blood cells under a microscope- Wow moment- number of cells in a drop of blood watch film made by Creative Team. What is the heart and what does it do? Watch and read https://www.bbc.co.uk/bitesize/topics/zwdr6yc/articles/ztg6gdm</p> <p>Watch teacher demonstration of pumping heart model.</p> <p>On your two-page spread record learning on blood, blood vessels and heart.</p> <p>Lesson 3: Healthy lifestyles/healthy heart. Watch and read... https://www.bbc.co.uk/bitesize/topics/zrffr82/articles/ztsqfcw</p> <p>How can we help our heart to be healthy. Watch Professor Brian Cox at the English Institute of Sports in Manchester looking at heart rate in top sports people. https://www.youtube.com/watch?v=b4MWrb9B0IU.</p> <p>Record learning.</p> <p>Check links to PD re impact of drugs possibly a good opportunity to revisit here.</p>
Milestones	<ul style="list-style-type: none"> • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood <ul style="list-style-type: none"> • recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function • describe the ways in which nutrients and water are transported within animals, including humans

YEAR 6: continued.

TERM	SUMMER 1
Term Thread	The Islamic Golden Age and The House of Wisdom
EXPLORE' for ½ term (trip, visitor, experience)	Visit the New South-East Asian exhibition at Manchester Museum when it opens. (In the meantime complete 'heart start' training with first aid and CPR)
Breadth of Study	PHYSICS
Threshold Concept	Investigating light and seeing - Light travels in straight lines, how our eyes work
Key Person/people	
LINK	We have been learning about the circulatory system, big leaps in understanding came through early Islamic scientist and thinkers building on the understanding of past civilisations. Ancient Greeks like Plato and Euclid believed the way we saw things was by light shining out of our eyes onto objects, like we have torches in our heads! Early Islamic scientist Ibn al-Haytham found out how we see. He was called the Father of Optics as all of our understanding on light and seeing come from his experiments and ideas. We are going to continue our work by carrying on working as Scientists investigate light and seeing.
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Development of Learning and Skills</p> <p>Lesson 1: Watch of the 'father of optics' Alhazen (Latin name for Ibn al-Haytham) as an introduction. https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-the-father-of-optics-alhazen/zry7vk7</p> <p>Revisit light sources from Year 3 and properties of light. Watch and read... https://www.bbc.co.uk/bitesize/topics/zbssgk7/articles/z2s4xf light sources include - the Sun, stars, lamps, torches, fires, luminescent creatures such as fireflies, glow-worms, helmet jellyfish, angler fish etc. are all light sources. Record learning</p> <p style="text-align: center;">Lesson 2: Light travels in straight lines- watch... https://www.bbc.co.uk/bitesize/clips/zyntsbk</p> <p>Teacher 'Light Show'. Teacher demonstrates a series of light experiments including - the same experiment outlined in the film of the light traveling through straight lines (see https://www.youtube.com/watch?v=4xq6TTsyyOI for a simple way to carry out this demonstration. Using shadow puppets made in DT to show how, because light travels in straight lines, the shadows have the same shape as the objects casting them. Explore bouncing beams of light with mirrors etc. Record learning.</p> <p style="text-align: center;">Lesson 3: How do our eyes work? How does the eye detect light?</p> <p>Watch... https://www.bbc.co.uk/bitesize/topics/zbssgk7/articles/zp7f8mn And watch 'The Human Eye and How it Works' https://www.bbc.co.uk/bitesize/clips/zf9c87h . With a partner observe how the pupil in the eye gets smaller when you shine light at it and gets larger when the light moves away use torches plus standing by a window. Record learning including a labelled diagram of the eye. Discuss blindness and peoples whose eyes don't function fully (why do we wear glasses).</p>
Milestones	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. • how our eyes work

YEAR 6

TERM	SUMMER 2
Term Thread	The Islamic Golden Age and The House of Wisdom
EXPLORE' for ½ term (trip, visitor, experience)	The Jewish History Museum
Breadth of Study	BIOLOGY
Threshold Concept	Understand animals and humans - Circulatory system, health and lifestyle
Key Person/people	
LINK	Last half term we began learning about the Islamic Golden Age. We discovered it was a time of a great coming together of knowledge and ideas from many cultures, in mathematics, chemistry, biology, physics, astronomy, geometry and more. This half term we are going to continue to explore the Islamic Golden Age. We will begin by looking more at the circulatory system. Much of our understanding began with the work of Ibn Al-Nafis, who was considered as being the greatest medical scholar and practitioner of his day.
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Application of Learning and Skills</p> <p>Lesson 1: Revisit the circulatory system. Label diagram. In small groups- (around 4-6) create a presentation. Choose between explaining the circulatory system (include the heart, blood vessels and blood) or the impact of diet, exercise, drugs and lifestyle on heart health and on the way our body's function. Present your work to the rest of the class- you can use drama (acting out the movement of blood/ how heart beats increase when exercising)/ posters/diagrams and other visual aids.</p> <p style="text-align: center;">Lesson 2: Watch Brian Cox films on fair testing ideas for the circulatory system. https://www.youtube.com/watch?v=3vmEMlwlAZI https://www.youtube.com/watch?v=Hs3Lbv588Po https://www.youtube.com/watch?v=Hs3Lbv588Po&t=55s</p> <p>Try measuring heart rates using three methods- finding pulse in wrist or neck/ using a stethoscope and stopwatch to count beats heard in one minute and use a pulsometer.</p> <p style="text-align: center;">Design a fair test to prove that the heart rate increases when a person exercises.</p> <p style="text-align: center;">Lesson 3: Perform fair test and record results. Present to others and discuss the outcome of fair test- write up method of testing with outcome.</p>
Milestones	<ul style="list-style-type: none"> • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their body's function • describe the ways in which nutrients and water are transported within animals, including humans

YEAR 6: continued.

TERM	SUMMER 2
Term Thread	The Islamic Golden Age and The House of Wisdom
EXPLORE' for ½ term (trip, visitor, experience)	The Jewish History Museum
Breadth of Study	PHYSICS
Threshold Concept	Investigating light and seeing - Light travels in straight lines, how our eyes work
Key Person/people	
LINK	<p>Ibn-al-Haytham was known as the Father of Optics. He is also known as ‘the first true scientist’ as he was the first to come up with using scientific experiments to prove a hypothesis (an idea or suggestion). We are going to continue our work this half term to develop our understanding of light and seeing by working as scientists. We will be using the scientific method of Ibn-al-Haytham of using experiments to prove and demonstrate ideas.</p>
No. of lessons	3
UNIT CONTENT	<p style="text-align: center;">Application of Learning and Skills</p> <p>Lesson 1: Revisit light travels in straight lines and how our eyes work. Label parts of the eye etc. Recap on light and shadows. End lesson by watching part of this longer film about light and seeing (which scientists call ‘optics’). In this section of film Physicist Jim al-Khalili, looks optics and traces the science of light back to the medieval Islamic world. https://www.youtube.com/watch?v=faQmHzY29Zc Watch from 6.18- 13.20. Set the challenge to devise your own camera obscura experiments and observations in the next lesson</p> <p>Lesson 2: devising camera obscura experiments/observation opportunities - you could build a model eye as a working pinhole camera/ turn the whole classroom into a camera- obscura/ make a handheld pinhole camera (see https://www.youtube.com/watch?v=MbTSinJxyZg for ideas) etc. Work out what materials you will require and hand in a materials list.</p> <p>Lesson 3: Construction of camera obscura displays/experiments. Demonstrate your experiments present your work to each other. Discussions and evaluations of outcomes.</p>
Milestones	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. • how our eyes work