Year 6 Science long term plan

Year 6 Term 1	Year 6 Term 2	Year 6 Term 3	Year 6 Term 4	Year 6 Term 5	Year 6 Term 6
Evolution and inheritance **Preteach – What do I already know about evolution and inheritance?** **Lesson 1 – How are fossils used to show what living things looked like millions of years ago?** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. **Lesson 2 – Why do offspring vary to their parents?** Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Begin to understand what is meant by DNA. **Lesson 3 – How and why do animals adapt to suit their environment?** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Talk about the work of Charles Darwin, Mary Anning and Alfred Wallace. Explain how some living things adapt to survive in extreme conditions. Analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet. **Lesson 4 – How do plants adapt to ensure survival?** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Explain how some living things adapt to survive in extreme conditions. Analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet. **Lesson 5 – How does adaptation lead to evolution?** Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Talk about the work of Charles Darwin, Mary Anning and Alfred Wallace. Analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet **Lesson 6 – How and why have eggs adapted to be the shape they are?** **(Formal investigation write up)**	**Light** **Preteach – What do I already know about light?** **Lesson 1 – How does light travel?** Recognise that light appears to travel in straight lines. **Lesson 2 – How do we see objects?** 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. Explain how different colours of light can be created. **Lesson 3 – What affects the shape of a shadow?** Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Lesson 4 – 5 – How can we increase the number of reflections in a mirror?** **(Formal investigation write up)** 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. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Choose the best way to answer a question. Use information from different sources to answer a question and plan an investigation. Make a prediction which links with other scientific knowledge. Identify the key factors when planning a fair test. Plan in advance which equipment they will need and use it well. Make precise measurements. Collect information in different ways. Record their measurements and observations systematically.	**Animals including humans** **Preteach – What do I already know about the circulatory system and the impact of diet and lifestyle on the human body?** **Lesson 1 – What are the main parts of the circulatory system?** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Compare the organ systems of humans to other animals. Explore the work of medical pioneers,for example, William Harvey and Galen and recognise how much we have learnt about our bodies. **Lesson 2 – What are the functions of the heart, blood vessels and blood?** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies. **Lesson 3 – How are water and nutrients transported within animals?** Describe the ways in which nutrients and water are transported within animals, including humans. Compare the organ systems of humans to other animals. Name and locate the major organs in the human body. Make a diagram of the human body and explain how different parts work and depend on one another. **Lesson 4 – How does diet impact on the way that a body functions?** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. **Lesson 5 – What is the impact of exercise on the human body?** **(Formal investigation write up)** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels,	**Living things and their habitats** **Preteach – What do I already know about classification?** **Lesson 1 – How do we categorise organisms?** 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. Explain why classification is important. Readily group animals into reptiles, fish, amphibians, birds and mammals. Group animals into vertebrates and invertebrates. **Lesson 2 – Which characteristics can I use to classify animals?** Give reasons for classifying plants and animals based on specific characteristics. Readily group animals into reptiles, fish, amphibians, birds and mammals. Group animals into vertebrates and invertebrates. **Lesson 3 – Which characteristics can I use to classify plants?** Give reasons for classifying plants and animals based on specific characteristics. **Lesson 4 – How do I create a classification key?** **(Group investigation task)** Give reasons for classifying plants and animals based on specific characteristics. Sub divide their original groupings and explain their divisions. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Collect information in different ways. **Lesson 5 – Who are key scientists in the field of classification?** Find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Explain why classification is important. Identifying scientific evidence that has been used to support or refute ideas or arguments. Explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough.	**Electricity** **Preteach - What do I already know about electricity and circuits?** **Lesson 1 – Which symbols do we use in a diagram of a simple circuit?** Use recognised symbols when representing a simple circuit in a diagram. . **Lesson 2 - 3 - How will the number of batteries in a circuit affect the volume of a buzzer?** **(Formal investigation write up)** Associate the brightness of a lamp (carried out in year 4) or the volume of a buzzer with the number and voltage of cells used in the circuit. 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Make a prediction which links with other scientific knowledge. Identify the key factors when planning a fair test. Explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough. Plan in advance which equipment they will need and use it well. Make precise measurements. Collect information in different ways. Record their measurements and observations systematically. Explain qualitative and quantitative data. Draw conclusions from their work. Link their conclusions to other scientific knowledge. Explain how they could improve their way of working. **Lesson 4 – What reasons are there for variations in how a component in a circuit functions?** Compare and give reasons for variations in how components function, including the brightness of	**Investigations (Forensic science)** **Preteach – What do I already know about forensic science?** **Lesson 1 – What are the different characteristics of fingerprints?** Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Use information from different sources to answer a question and plan an investigation. **Lesson 2 – How can I separate colours?** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Use information from different sources to answer a question and plan an investigation. Plan in advance which equipment they will need and use it well. Explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough. **Lesson 3 – What evidence can I gather from a crime scene?** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Use information from different sources to answer a question and plan an investigation. Plan in advance which equipment they will need and use it well. Explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough. Make precise measurements. Collect information in different ways. 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Make a prediction which links with other scientific knowledge. Collect information in different ways. Record their measurements and observations systematically. Draw conclusions from their work. Link their conclusions to other scientific knowledge. Explain how they could improve their way of working.	Draw conclusions from their work. Link their conclusions to other scientific knowledge. Explain how they could improve their way of working. **Lesson 6 – How can I construct my own periscope?** 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 and explain how simple optical instruments work (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope).	classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments. Choose the best way to answer a question. Use information from different sources to answer a question and plan an investigation. Make a prediction which links with other scientific knowledge. Identify the key factors when planning a fair test. Explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough. Plan in advance which equipment they will need and use it well. Make precise measurements. Collect information in different ways. Record their measurements and observations systematically. Explain qualitative and quantitative data. Draw conclusions from their work. Link their conclusions to other scientific knowledge. Explain how they could improve their way of working. **Lesson 6 – What are the impacts of drugs and lifestyle choices on the way that the human body functions?** Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.		bulbs, the loudness of buzzers and the on/off position of switches. Explain the danger of short circuits. Explain how to make changes in a circuit. Explain the impact of changes in a circuit Explain the effect of changing the voltage of a battery. **Lesson 5 – 6 – How do I construct a circuit to give a specific outcome?** **(Group investigation)** Make their own traffic light system or something similar. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Choose the best way to answer a question. Use information from different sources to answer a question and plan an investigation. Plan in advance which equipment they will need and use it well. Collect information in different ways. Draw conclusions from their work. Explain how they could improve their way of working.	Draw conclusions from their work. Link their conclusions to other scientific knowledge. Explain how they could improve their way of working. **Lesson 4 – How could magnification help to solve a crime?** Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. 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Resources					
Focus scientist for display: Motoo Kimura - biologist who used mathematics to explain evolution.	**Focus scientist for display: Dr Patricia Bath – first female African-American medical doctor to receive a medical patent when she invented a laser cataract treatment device called a Laserphaco Probe in 1986.**	**Focus scientist for display: Mary M. Daly – first African American woman to earn a PhD in biochemistry and her groundbreaking work helped to clarify how the human body works.**	**Focus scientist for display: Louis R Purnell Jr – first black curator at the Smithsonian and an expert at identifying nautiloids.**	**Focus scientist for display: Vivian Yam Wing-wah - won the Asia-Pacific L'Oréal-Unesco Award for Women in Science "for her work on light-emitting materials and innovative ways of capturing solar energy" and her research on organic light-emitting diodes, which are brighter and make better use of energy than the older light-emitting diodes, has helped create more efficient displays on mobile phones and laptops.**	**Focus scientist for display: Henry Chang-Yu Lee - one of the world's foremost forensic scientists and founder of the Henry C. Lee Institute of Forensic Science.**