

Manor Primary School

Science Year 6: Animals including humans

<p>Overview of the Learning: In this unit of learning children will explore the structure of the heart and lungs. The double circulation through the lungs and the rest of the body is explained and children learn more about blood! How does exercise affect pulse rate? Why exercise is good for us and what can harm the heart and lungs?</p>	
<p>Core Aims</p> <ul style="list-style-type: none">develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics about humans and other animalsdevelop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around themare equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.	<p>Pupils should be taught to work scientifically. They will:</p> <ul style="list-style-type: none">planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessarytaking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriaterecording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphsusing test results to make predictions to set up further comparative and fair testsreporting 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 presentationsidentifying scientific evidence that has been used to support or refute ideas or arguments <p>Pupils should be taught about animals including humans:</p> <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 bloodrecognise the impact of diet, exercise, drugs and lifestyle on the way their bodies functiondescribe the ways in which nutrients and water are transported within animals, including humans.



Expectations

Children can:

- 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.
- recording data and results of increasing complexity using scientific diagrams and labels, 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.



Manor Primary School Science Year 6: Electricity

Overview of the Learning:

In this unit of learning children will consolidate knowledge of materials which are electrical conductors, extend understanding of ways in which the brightness of bulbs or speed of motors in a circuit can be changed and develop children's understanding of the value of using conventional symbols for communication. This unit provides opportunities for children to carry out a complete investigation relating to electric circuits. Work in this unit also offers opportunities for relating knowledge and understanding of electricity to familiar phenomena.

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- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

Pupils should be taught to work scientifically. They will:

- 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
- 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
- to continually make systematic evaluations when designing and making, to bring about improvements in processes and outcomes
- identifying scientific evidence that has been used to support or refute ideas or arguments

Pupils should be taught about electricity:

- 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.
- identify and name the basic parts of a simple electric series circuit, including cells, wires, bulbs, switches, and buzzers, and compare and give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches
- explain that short circuits may cause wires to heat up and that fuses are electrical safety devices that are triggered by short circuits
- explain the effect of changing the voltage of a battery.

Expectations

Children can:

- 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.
- identify and name the basic parts of a simple electric series circuit, including cells, wires, bulbs, switches, and buzzers, and compare and give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches
- explain that short circuits may cause wires to heat up and that fuses are electrical safety devices that are triggered by short circuits
- explain the effect of changing the voltage of a battery.
- 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
- 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.

Manor Primary School Science Year 6: Evolution and inheritance

Overview of the Learning:

In this unit of learning children will recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Children will recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. They will identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Core Aims

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- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
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Pupils should be taught to work scientifically. They will:

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- 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

Pupils should be taught about evolution and inheritance:



- 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.

Expectations

Children can:

- 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
- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
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Manor Primary School

Science Year 6: Investigating Light & How We See Things!

Overview of the Learning:

In this unit of learning children will investigate mirrors and shiny surfaces and how they alter the direction in which light travels and that when they see objects, light enters the eye. Children contrast reflection and shadow formation. Work in this unit also offers opportunities for children to investigate first hand refraction, colours of light and the making of a periscope. Science learning will include also the works of key scientific figures like the British scientist Isaac Newton and invention of the first reflecting telescope.

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- identifying scientific evidence that has been used to support or refute ideas or arguments

Pupils should be taught about light and how we see:

- 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.



- explain that light can be broken into colours and that different colours of light can be combined to appear as a new colour.
- use simple optical instruments.

Expectations

Children can:

- 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.
- explain that light can be broken into colours and that different colours of light can be combined to appear as a new colour.
- use simple optical instruments.
- 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
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Science Year 6: Living things and their habitats

Overview of the Learning:

The unit build on the previous content by introducing pupils to the importance of classification, including introduction to the term kingdom, the five kingdoms of all living things (bacteria, protists, animals, plants and fungi); vertebrates (reptiles, fish, amphibians, birds and mammals) and their similarities and differences; invertebrates; and ways of splitting these large groups into smaller groups e.g. mammals can be divided into three groups according to how their young develop: placental (live/ fully formed babies at birth); marsupial (pouched); and monotreme (egg laying) mammals.

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- identifying scientific evidence that has been used to support or refute ideas or arguments

Pupils should be taught about Living things and their habitats:

- Explain the classification of living things into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms.
- Compare the life process of reproduction amongst plants and animals
- Describe the changes as humans develop from birth to old age.



- some plants reproduce sexually (an offspring has two parents): mosses and ferns reproduce with spores, conifers reproduce with seeds contained in cones, flowering plants reproduce with seeds contained in fruit. Other plants also reproduce asexually: runners (strawberries), bulbs (daffodils), stems (roses). animals reproduce sexually: fish: eggs are externally fertilised; birds: eggs are internally fertilised and laid as a shelled egg; mammals, including humans: eggs are internally fertilised and young are born alive.
- Pupils can apply their knowledge and skills by: comparing the characteristics of vertebrates and invertebrates including: whether they have a backbone, scales, feathers, hairy skin; body temperature; whether they lay eggs; and whether they feed young on milk etc. observing and recording, with accuracy, the parts of a flower e.g. by taking apart a flower and identifying its constituent parts. discussing how fruits and seeds develop from the ovary and ovules in the carpel.

Expectations - Children can:

- Explain the classification of living things into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms.
- Compare the life process of reproduction amongst plants and animals
- Describe the changes as humans develop from birth to old age.
- some plants reproduce sexually (an offspring has two parents): mosses and ferns reproduce with spores, conifers reproduce with seeds contained in cones, flowering plants reproduce with seeds contained in fruit. other plants also reproduce asexually: runners (strawberries), bulbs (daffodils), stems (roses). animals reproduce sexually: fish: eggs are externally fertilised; birds: eggs are internally fertilised and laid as a shelled egg; mammals, including humans: eggs are internally fertilised and young are born alive.
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
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- 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
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Manor Primary School Science Year 6: Scene of Crime Investigation

Overview of the Learning:

In this unit of learning children will carry out a range of investigations around a crime scene. All of the learning is around SC 1 and recovers some of the knowledge and understanding covered across their learning in upper KS 2. This is a Forensic science unit all based around SCI. At the start/ end of unit get children to create concept map of how can we solve a crime?

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- 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

Pupils should be taught about investigating a scene of Crime:



- observe and explore to generate ideas, define problems and pose questions in order to develop investigations and products
- engage safely in practical investigations and experiments and gather and record evidence by observation and measurement
- apply practical skills to design, make and improve products taking account of users and purposes
- communicate and model in order to explain and develop ideas, share findings and conclusions
- to continually make systematic evaluations when designing and making, to bring about improvements in processes and outcomes

Expectations – Children can:

- observe and explore to generate ideas, define problems and pose questions in order to develop investigations and products
- To plan practical investigations and experiments and gather and record evidence by observation and measurement
- apply practical skills to design, make and improve products taking account of users and purposes. To communicate and model in order to explain and develop ideas, share findings and conclusions
- to continually make systematic evaluations when designing and making, to bring about improvements in processes and outcomes
- recording data and results of increasing complexity using scientific diagrams and labels, 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
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Preparation – The children need to gather together evidence in order to work out who knocked out the caretaker and stole the laptop.

Although some of the evidence is inconclusive, there is enough to build a case against 'Suspect 3'. The 'evidence sheet' at the bottom of these plans shows how to direct the evidence at Suspect 3, but without making it too obvious too soon.



All the clues need to be carefully looked at in the context of the specific school. You could have some of the clues in the Suspects' classrooms which the children must go and collect (in transparent food bags!)

The cup of tea belonging to the caretaker and found by his unconscious body must have been left for 15 minutes from the time of the crime – the temperature of this can be shown on a data logger on a video filmed when the body was discovered.

The children could finally present their case in court room scenario.

The culprit must be linked to the following items:

1. Soil on her shoe – has the same pH as that found at the scene.
2. The ink with which the map was drawn with.
3. Hair sample
4. A fibre from an item of their clothing
5. Fingerprint found on the laptop
6. Footprint found outside the classroom
7. Tea – no-one had seen them 15 minutes before the body was discovered

