Year 6 Science

Working Scientifically

6.WS1 - Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

6.WS2 - Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

6.WS3 - Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

6.WS4 - Using test results to make predictions to set up further comparative and fair tests					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

6.WS5 - Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

6.WS6 - Identifying scientific evidence that has been used to support or refute ideas or arguments					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.

They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the programme of study can be met by the end of year 6. Pupils are not expected to cover each aspect for every area of study.

Year 6 Science

Living Things and Habitats

6.LT1 - 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					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.LT2 - Give reasons for classifying plants and animals based on specific characteristics					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. 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. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

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.

Year 6 Science

Animals Including Humans

6.A1 - 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.					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.A2 - 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.					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.A3 - Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
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.					
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Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.					

Year 6 Science

Evolution and Inheritance

6.EI1 - Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.EI2 - Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.EI3 - Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to 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. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.					
Note: at this stage, pupils are not expected to understand how genes and chromosomes work.					
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 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.					

Year 6 Science

Light

6.L1 - Recognise that light appears to travel in straight lines					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.L2 - 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					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
L3 - 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					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.L4 - Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them					
Not Met	Shallow	Emerging	Developing	Deepening	Functional

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.

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).

Year 6 Science

Electricity

6.E1 - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.E2 - 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					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
6.E3 - Use recognised symbols when representing a simple circuit in a diagram					
Not Met	Shallow	Emerging	Developing	Deepening	Functional
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. They should learn how to represent a simple circuit in a diagram using recognised symbols.					
Note: pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity.					
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.					