Claremont Primary and Nursery School Science Curriculum

Year 6: How are living things grouped together?

NC link: Living Things and their Habitats

Objectives:

- Explain the requirements for life
- Be able to describe how living things are classified into groups
- Classify animals based on their characteristics
- Be able to classify a plant based on its characteristics
- Identify the characteristics of different types of microorganisms
- Classify microorganisms based on their characteristics
- Explain the work of Carl Linnaeus and his system of classifying organisms

Substantive Knowledge:

- 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
- give reasons for classifying plants and animals based on specific characteristics.

Disciplinary knowledge (Think like a scientist):

- 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.

Key Vocabulary:

Organism, excretion, reproduction, living, non-living, vertebrate, invertebrate, flowering plant, non-flowering plant, mollusc, arachnid, classification, deciduous tree, evergreen tree, coniferous tree, organism, microorganism, bacteria, virus, fungi, microscope, classification key, classification, characteristics, Carl Linnaeus

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Year 6: What can we learn from studying circuits?

NC link: Electricity

Objectives:

- Construct and draw series circuits using symbols
- Explain the difference between complete and incomplete circuits and explain why a circuit may be incomplete
- Explain variations within circuits
- Plan an investigation into how the voltage in a circuit affects the loudness of a buzzer
- Investigate how the voltage in a circuit affects the loudness of a buzzer
- Evaluate results from a previous investigation on voltage in a circuit, saying how it can be extended and improved

Substantive Knowledge:

- 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.

Disciplinary knowledge (Think like a scientist):

- 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.

Key Vocabulary:

Series circuit, cell, battery, bulb, current, voltage, complete circuit, incomplete circuit, switch, buzzer, series circuit, independent variable, dependent variable, controlled variable, repeatability, accuracy, evaluate

Claremont Primary and Nursery School Science Curriculum

Year 6: How do we see?

NC link: Light

Objectives:

- Explain how we see
- Explain that light travels in straight lines from light sources to our eyes and from light sources to objects and then to our eyes
- Explain why shadows have the same shape as the object that cast them
- Plan an investigation into whether the distance from a light source affects the size of the shadow
- Carry out an investigation into whether the distance from a light source affects the size of the shadow
- Use findings from our previous investigation to explain these findings to show how the distance from a light source affects the size of a shadow
- Explain what refraction is and how it works
- Explore different concepts of light

Substantive Knowledge:

- 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.

Disciplinary knowledge (Think like a scientist):

- 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.

Key Vocabulary:

Light source, iris, retina, pupil, lens, reflection, ray diagram, angle, periscope, shadow, opaque, translucent, transparent, solar eclipse, independent variable, dependent variable, controlled variable, conclusion, evaluate, medium, refraction, rainbow, prism, coloured filter, spectrum of light

Claremont Primary and Nursery School Science Curriculum

Year 6: Why do we need to look after our heart?

NC link: Animals including Humans

Objectives:

- Explain the main parts of the circulatory system
- Describe the important jobs of the blood vessels and blood
- Describe the function of the heart within the circulatory system
- Explain blood flow
- Understand and explain the difference between oxygenated and deoxygenated blood
- Explain the impact of diet on the health of the human heart
- Explain the effects of drugs on the human body
- Explain the effects of smoking and vaping on the human body
- Plan, carry out and evaluate an investigation on whether the duration of exercise affects heart rate

Substantive Knowledge:

- 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.

Disciplinary knowledge (Think like a scientist):

- 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.

Key Vocabulary:

Circulatory system, red blood cells, white blood cells, lungs, nutrients, plasma, oxygen, lungs, blood vessels, veins, arteries, capillaries, oxygenated blood, deoxygenated blood, heart, atria, ventricles, right atrium right ventricle, left atrium, left ventricle, dissection, balanced diet, calories, unsaturated fats, saturated fats, trans fats, drug, painkiller, stimulants, depressants, cigarette, vape, tar, nicotine, carbon monoxide, addiction, independent variable, dependent variable, controlled variable, exercise, heart rate, duration, conclusion, evaluation

Claremont Primary and Nursery School Science Curriculum

Year 6: How has evolution led to me?

NC link: Evolution and Inheritance

Objectives:

- Explain the concept of variation
- Explain the scientific concept of inheritance and characteristics
- Demonstrate understanding of the scientific meaning of adaptation
- Explain how plants are adapted to survive their habitats
- Be able to understand how human beings have evolved
- Explain the importance of Charles Darwin and his contributions towards understanding the process of evolution
- Explain what natural selection is and the part it plays in evolution

Substantive Knowledge:

- 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.

Disciplinary knowledge (Think like a scientist):

- 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.

Key Vocabulary:

Claremont Primary and Nursery School Science Curriculum

Year 6: What can Fossils tell us?

NC link: Evolution and Inheritance

Objectives:

- Explain what fossils are and how they are formed
- Explore different types of fossils and what scientists can learn from them
- Explain the importance of Mary Anning's contributions to fossil exploration

Substantive Knowledge:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

Disciplinary knowledge (Think like a scientist):

- Identifying scientific evidence that has been used to support or refute ideas or arguments.
- 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.
- 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 (non-statutory).

Key Vocabulary:

Fossil, rock, decompose, skeleton, Charles Darwin, evolution, palaeontologist, Mary Anning