

**Science: Year 5/6 Cycle A**  
**Living things and their habitats (Autumn 1)**

**Key Vocabulary**

Characteristics	Special qualities or appearances that make an individual or group of things different to others.
Classify	To sort things into different groups.
Key	A series of questions about the characteristics of living things answered by yes or no.
Microorganism	A living thing that can only be seen using a microscope e.g. bacteria, yeast and mould.
Species	A group of animals that can reproduce to produce fertile offspring.

**SC1: Scientific concepts (NC Statements).**

- 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.

**SC2: Scientific skills.**

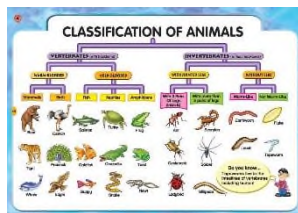
- Use classification systems and keys to identify some animals and plants in the immediate environment (science garden).
- Research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.
- Present classification in different ways: Venn diagrams, carroll diagrams and keys.

**SC3: Why don't you?**

- Find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.
- Conduct a survey of animals found in rock pools at Robin Hood's Bay and classify them.

**Key facts**

- Living things can be formally grouped according to characteristics.
- Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. microorganisms such as bacteria and yeast, toadstools and mushrooms.
- Plants can make their own food whereas animals cannot.
- Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates).
- Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics.
- Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.
- Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.



## Science: Year 5/6 Cycle A

### Electricity (Autumn 2)

#### Key Vocabulary

Circuit	A circuit is a complete path around which electricity can flow.
Diagram	Circuits drawn using symbols.
Symbol	A drawing or mark which represents something else.
Cell	A cell is a single unit that converts chemical energy into electrical energy.
Battery	a battery is a collection of cells.
Bulb	Uses the energy to produce light.
Buzzer	Uses the energy to produce sound.
Motor	A component which moves when energy passes through.
Switch	Part of a circuit which can be opened or closed controlling the flow of electricity.
Voltage	is the difference in electrical energy between two parts of a circuit.

#### Key facts

- Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound.
- If you use a battery with a higher voltage, the same thing happens.
- Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter.
- Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.
- You can use recognised circuit symbols to draw simple circuit diagrams.

#### SC1: Scientific concepts (NC Statements).

- 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.

#### SC2: Scientific skills.

- Represent (draw) a simple circuit using the recognised symbols.
- Systematically identify the effect of changing one component at a time in a circuit.
- Design and make a set of traffic lights or a burglar alarm using their knowledge of circuits.
- Predict how different components will react in different circuits.

#### SC3: Why don't you?

- Make circuits that are linked to a D.T. project (lighthouses).
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**Science: Year 5/6 Cycle A**  
**Working Scientifically: States of Matter (Spring 1)**

**Key Vocabulary**

Plan	To decide what you are going to do.
Predict	A guess at what will happen in the investigation based on knowledge.
Observe	To look at something carefully.
Accurate	To repeat an experiment in order to gain more reliable measurements.
Measurements	The size, length or amount of something.
Record	To write down the findings, results of measurements of an experiment.
Report	To share your findings with a group.
Conclusion	A statement to say what has been worked out by an experiment.

**SC1: Scientific concepts (NC Statements).**

Recap of materials from Year 4 (metacognition) using strands from the working scientifically in UKS2 to build upon previous knowledge.

- Year 4 objectives: compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

**Key facts**

- Recap on key vocabulary from year 4: Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle.
- Introduce/recap working scientifically vocabulary above ready for lots of hands on practical investigations.

**SC2: Working scientifically.**

- 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.

**SC3: Why don't you?**

- Explore solids that don't behave:  
<https://www.stem.org.uk/resources/elibrary/resource/33266/biscuit-bashing>
- Drying fabric investigations and condensation:  
[https://www.stem.org.uk/system/files/elibrary-resources/legacy\\_files\\_migrated/3060-5.1\\_changing\\_water.pdf](https://www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/3060-5.1_changing_water.pdf)
- Dissolving:  
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- More supporting documents in the subject file.

To decide what you are going to do.

A guess at what will happen in the investigation based on knowledge.

To look at something carefully.

To repeat an experiment in order to gain more reliable measurements.

The size, length or amount of something.

To write down the findings, results of measurements of an experiment.

To share your findings with a group.

A statement to say what has been worked out by an experiment.

## Science: Year 5/6 Cycle A

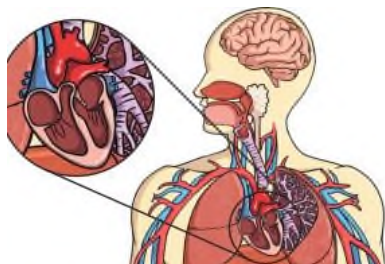
### Animals including humans (Spring 2)

#### Key Vocabulary

oxygenated blood	Oxygenated blood has more oxygen. It is pumped from the heart to the rest of the body.
deoxygenated blood	Deoxygenated blood is blood where most of the oxygen has already been transferred to the rest of the body.
blood vessels	The tube-like structures that carry blood through the tissues and organs. Veins, arteries and capillaries are the three types of blood vessels.
arteries	Arteries carry oxygenated blood away from the heart.
veins,	Veins carry deoxygenated blood toward the heart.
capillaries	Capillaries are the smallest blood vessels in the body and it is here that the exchange of water, nutrients, oxygen and carbon dioxide takes place.
Circulatory system	A system which includes the heart, veins, arteries and blood transporting substances around the body.
oxygen	A colourless, odourless reactive gas that is the life-supporting part of the air.
carbon dioxide	CO <sub>2</sub> is a chemical compound. It is a gas at room temperature. It is made of one carbon and two oxygen atoms. People and animals release carbon dioxide when they breathe out.
nutrients	Substances that animals need to stay alive and healthy.

#### Key facts

- Mammals have hearts with four chambers.
- The heart pumps blood to the lungs to provide oxygen.
- Blood that has come from the lungs is oxygenated and blood that is come from the body is deoxygenated.
- Regular exercise strengthens muscles including the heart muscle, improves circulation, increases the amount of oxygen around the body, releases brain chemicals which help you feel calm and relaxed, helps you sleep more easily and strengthens bones. It can even help to stop us from getting ill.



#### SC1: Scientific concepts (NC Statements).

- 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.

#### SC2: Working Scientifically

- Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.
- Carry out a survey: identify the most popular forms of exercise in your class or school. Record results in a tally chart then display in a bar chart (Excel). Identify the most popular forms of exercise and suggest ways in which they can be promoted in school.

#### SC3: Why don't you?

- Blood plasma investigation: <https://www.risingstars-uk.com/blog/may-2018/a-bloody-investigation>
- Carry out a range of pulse rate investigations: fair test – effect of different activities on my pulse rate: pattern seeking – exploring which groups of people may have higher or lower resting pulse rates: observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate) and pattern seeking – exploring recovery rate for different groups of people.
- Create a role play model for the circulatory system.

Prior learning:

Years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system).

**Science: Year 5/6 Cycle A**  
**Evolution and Inheritance (Summer 1)**

**Key Vocabulary**

Evolution	Adaptation over a very long time.
Inheritance	When characteristics are passed on offspring from their parents.
Adaptation	Is a trait, or characteristic changing to increase a living thing's chances of surviving and reproducing.
Offspring	The young animal or plant that is produced by the reproduction of that species.
Variations	The differences between individuals in a species.
Characteristics	Distinguishing features or qualities that are specific to a species.
Natural selection	The process where organisms which are adapted to suit their environment survive and produce more offspring.

**Key facts**

- Children should be introduced to the idea that characteristics are passed from parents to their offspring (inherited), 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.
- Plants and animals have characteristics that make them suited to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution.
- Fossils give us evidence of what lived on the Earth millions of years ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.

**SC1: Scientific concepts (NC Statements).**

- 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 were previously taught about how fossils are formed in Year 3/4).*
- 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.

**SC2: Scientific skills.**

- Observe and raise 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.
- Analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

**SC3: Why don't you?**

- Find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.
- Link to Robin Hood's Bay Visit from Year 5/6 and discuss why fossils are commonly found there.
- Yorkshire Wildlife Park visit (Darwin's finches).

**NOTE:** Children at this stage are not expected to understand how genes and chromosomes work.

## Science: Year 5/6 Cycle A

### Light (Summer 2)

#### Key Vocabulary

Light	A form of energy that travels in a straight line from a source.
Light source	An object that makes its own light.
Transparent	Let light travel through.
Translucent	Let some of the light travel through.
Opaque	Let none of the light travel through.
Reflect	Light bounces off a surface changing the direction of the ray of light.
Shadow	An area of darkness where light has been blocked.

#### Key facts

- Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen.
- Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.



#### SC1: Scientific concepts (NC Statements).

- 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.

#### SC2: Scientific skills.

- Decide where to place rear-view mirrors on cars.
- Design and make a periscope and using the idea that light appears to travel in straight lines to explain how it works.
- Investigate the relationship between light sources, objects and shadows by using shadow puppets.

#### SC3: Why don't you?

- Children 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).