



Lower Key Stage 2 Science Progression of Knowledge & Skills Cycle A



BIG Ideas

- There is a relationship between structure and function.
- Living and non-living things can be grouped in a variety of ways.
- Humans move through different stages of growth and development.
- All matter on Earth exists in one of three states: solid, liquid, gas and the state of matter can change.
- Living things have characteristics and requirements for life, growth and health.
- Changing the movement of an object requires a net force (push or pull) to be acting on it.
- Living things depend on each other and on the environment; humans can have both a positive and negative impact.
- The diversity of organisms, living and extinct, is the result of evolution.
- Energy makes things happen and can be seen by its effects; it can be transferred (but is not used up)
- The movement of the Earth affects the seasons and times of day.

Working Scientifically

These are integrated throughout the Science curriculum and appear in the Progression of Knowledge and Skills for each unit.

(Formerly Year 3)

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

(Formerly Year 4)

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings

Vocabulary:

(Formerly Year 3)

Question, observe, test, identify, classify, answer, record, data, Venn diagram, chart, equipment, safety, measure

(Formerly Year 4)

analyse, bar chart, change, classify, comparative test, conclusion, data, data logger, diagram, display, enquiry, equipment, evidence, explain, fair test, findings, gather, group, identify, key, measurement, note,

observe, pattern, predict, present, process, question, record, relationship, results, secondary source, similarity, sort, standard unit, systematic, table, thermometer, value

Forces and Magnets (Formerly Year 3)

BIG Ideas

BIG IDEA 2. Living and non-living things can be grouped in a variety of ways

BIG IDEA 6. Changing the movement of an object requires a net force (push or pull) to be acting on it

Enquiry Questions:

1. What Is a Contact Force?
2. How Do Different Surfaces Affect the Movement of Objects?
3. What Is a Magnet and How Do They Work?
4. What Materials Are Attracted to A Magnet?
5. Do All Magnets Have the Same Strength?

Sc3/4.2a compare how things move on different surfaces

I know that contact forces are pushes and pulls that require contact between two objects.
I know that friction is a contact force that affects the movement of objects.
I know that friction acts in the direction opposite to that of the object moving on the surface.
I know that smoother surfaces produce less friction.

I can use observation to identify forces being used and to identify the effect these forces have on objects.
I understand why tests should be fair and control all but one variable (the surface the car travels on).
I can independently set up an investigation that follows the agreed method.
I can use measuring tape to measure the distance the cars travel.
I can record results in a table and use this data to draw conclusions about which surface slowed down the moving object the most.

Sc3/4.2b notice that some forces need contact between 2 objects, but magnetic forces can act at a distance

I know that the force of magnetism can act at a distance.
I can make systematic observations, testing the strength of magnetism from different distances.

Sc3/4.2c observe how magnets attract or repel each other and attract some materials and not others

I know that magnets have a magnetic field within which they attract magnetic objects.
I can predict whether two magnets will attract or repel each other, depending on which poles are facing.

Sc3/4.2d compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials

I know that metals containing iron, steel and nickel will be attracted to magnets.
I can sort into groups objects that are attracted to magnets and those that are not.
I can carry out a simple investigation and record results (bringing a range of materials near a magnet to test magnetism).

Sc3/4.2e describe magnets as having 2 poles

I know that magnets come in different forms.
I know that magnets have two poles. The poles may attract or repel depending on which poles are facing each other.
I know that different magnets have different strengths of magnetic field.

Sc3/4.2f predict whether 2 magnets will attract or repel each other, depending on which poles are facing.

I know that magnets have two poles. The poles may attract or repel depending on which poles are facing each other.
I know that different magnets have different strengths of magnetic field.
I can carry out a simple investigation, record results in a table and use these to present data in a bar chart.
I can measure the strength of a magnet by working out how many sheets of paper need to be in the way before a paperclip is no longer attracted.
I can discuss the factors that might influence magnet strength, such as the size, shape, and material of the magnet.

Vocabulary: force, contact force, push, pull, friction, resistance, surface, movement (method, fair test, variable, conclusion), gravity, magnet, magnetism, magnetic field, attract, repel, magnetic objects, north pole, south pole, metal, iron, steel, nickel, horseshoe magnet, bar magnet, ring magnet, strength of magnetic field.

Animals, including humans (Formerly Year 3)

BIG IDEA

- 1. There is a relationship between structure and function**
- 2. Living and non-living things can be grouped in a variety of ways**
- 5. Living things have characteristics and requirements for life, growth and health**
- 7. Living things depend on each other and on the environment; humans can have both a positive and negative impact**

Enquiry Questions:

1. Why do we have different shaped teeth?
2. What can we tell about an animal from looking at its teeth?
3. What happens to our food when we eat it?
4. Can models help us understand human processes?
5. Why are food chains important?

Describe the simple functions of the basic parts of the digestive system in humans

I know the simple functions of the basic parts of the digestive system in humans (mouth, tongue, teeth, oesophagus, stomach, and small and large intestine).
I can create a model of the stomach to see the properties a stomach needs if the capacity needs to increase.
I can set up a simple practical enquiry.
I can make systematic and careful observations.
I can report on findings from enquiries, including oral/written explanations.
I can create a model to show and explain a process (the digestive system).

Identify the different types of teeth in humans and their simple functions

I know the different types of teeth in humans (incisor, canine, molar, pre-molar) and their simple functions.
I know the types of teeth (incisor, canine, molar, pre-molar) in different animals (carnivore, herbivore, omnivore) and their simple functions.
I can collectively set up and monitor an experiment to see how different liquids affect our teeth.
I can set up simple practical enquiries, comparatives and fair tests (eggshells in different liquids but kept in same place).
I can collectively observe over time and draw conclusions.
I can recognise when and how secondary sources might help me to answer questions that cannot be answered through practical investigations.
I can make a judgement about an animal's diet by looking at its teeth.

Construct and interpret a variety of food chains, identifying producers, predators and prey

I know how to construct and interpret a variety of food chains, identifying producers, predators and prey.
I know that food chains use arrows to show the movement of energy (food) through the food chain.
I can sort living things according to their role in a food chain and then according to their habitat.

Vocabulary:

teeth, incisors, molars, premolars, canines, revisit omnivore, herbivore and carnivore, adaptation, digestive system, mouth, tongue, oesophagus, stomach, small intestine, large intestine (NC); acids, nutrients, bloodstream, waste, rectum, anus, food chain, producer, primary/secondary/tertiary consumer, prey, predator, energy

Light (Formerly Year 3)

BIG IDEA 1. There is a relationship between structure and function

BIG IDEA 9. Energy makes things happen and can be seen by its effects; it can be transferred (but is not used up)

BIG IDEA 10. The movement of the Earth affects the seasons and times of day

Enquiry Questions:

1. Can We See Without Light?
2. How Does Light Behave When It Is Reflected?
3. Can We Change How Shadows Are Formed?
4. How Can We Protect Our Eyes From The Sun?
5. Do Shadows Stay the Same All Day?

Sc3/4.1a recognise that they need light in order to see things and that dark is the absence of light

I know that we need light to see. If there is no light, we cannot see.
I know some objects are visible because they are light sources, and some are visible because they reflect light.
I know light travels in straight lines, hits objects and bounces off into our eyes and that is how we see things.
I can set up a simple comparative test to see which materials can be seen in low light.
I can make systematic and careful observations to identify which objects can be seen in different lighting conditions.
I can record findings in a table.

I can report on findings and draw a conclusion about which materials are more visible in low light.
Sc3/4.1b notice that light is reflected from surfaces
I know that we can see in a mirror because light is reflecting off the surface and into our eyes. I know that changing the angle of the mirror changes the direction in which light is reflected. I can make careful observations when using mirrors, to learn how light behaves when it is reflected . I can write a written explanation of the learning about light and reflection.
Sc3/4.1c recognise that light from the sun can be dangerous and that there are ways to protect their eyes
I know that we should not look directly at the sun as this can cause damage to our eyes. I know we can protect our eyes with hats and sunglasses and by not looking directly at the sun or bright lights. I can report findings about keeping eyes safe in the sun.
Sc3/4.1d recognise that shadows are formed when the light from a light source is blocked by a solid object
I know that shadows are formed when objects block light. I know that opaque objects create darker shadows and transparent objects create lighter shadows. I know the closer the light source is to the object, the bigger the shadow will be or the higher the light source is, the smaller the shadow will be. I can take systematic and accurate measurements of length in cm, to measure how shadows change in size. I can use observation (how does the height of light change shadows), tables of data (how does distance affect shadow size) and comparison (which objects create darker shadows) to answer questions. I can use a simple diagram to show how shadows are formed. I can use results to draw simple conclusions about why distance and height changes the size of shadows. I can use straightforward scientific evidence to answer questions or to support my findings.
Sc3/4.1e find patterns in the way that the size of shadows change.
I know that the length of shadows changes during a day as the Earth rotates and the sunlight hits the object from a different position. I know shadows are shortest when the sun is high in the sky and longest when the sun is lower in the sky. I can collectively set up a simple comparative and fair test to see how shadows change over the course of the day. I can make careful observations of how the position and size of shadows changes and take accurate measurements using standard units of the length. I can use an appropriate graph/chart to show how shadows change across a day. I can identify and explain differences, similarities or changes related to simple scientific ideas and processes (how and why shadows change).
Vocabulary: light, reflect, light source, visible, visibility, dark, shiny, bright, dull, matt, mirror, reflection, reflect, angle, opaque, translucent, transparent, shadows, angle, position, direction, filters, UV rays, protection, retina, pupil, damage, sunrise, sunset, rotation, compass direction
Electricity (Formerly Year 4)
BIG IDEA
2. Living and non-living things can be grouped in a variety of ways
9. Energy makes things happen and can be seen by its effects (light, sound, electricity); it can be transferred but is not used up
Enquiry Questions: • Where does electricity come from and what is it used for? • How can we light a bulb using a simple, series electrical circuit? • How does a simple switch work? • What material is the best conductor of electricity? • What components are needed to make a working circuit?
Identify common appliances that run on electricity
I know the precautions we should take for working safely with electricity. I know where electricity comes from and how it is used. I know common appliances that run on electricity. I can make systematic and careful observations about how appliances convert electrical energy. I can identify scientific evidence that has been used to support or refute ideas or arguments (Erik Bystrup).

I can explain how to be safe around electricity. I can identify how science helps engineers improve the world around us. I can sort devices according to whether they use mains or battery electricity.
Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
I know how to construct a simple series circuit, identifying and naming its basic parts, including a cell, wire, bulb, bulb holder. I know that a correctly built simple, series circuit creates a working device.
I can use scientific language and knowledge of circuits to design diagrams and create functional objects.
Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
I know whether a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
I can set up a simple, practical investigation - using all components to light a bulb. I can verbally report on findings. I can investigate questions e.g. does the order of the components matter? I can use my knowledge and experience to form hypotheses and then test them out.
Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
I know that a switch opens and closes a circuit and associate this with whether or not a bulb lights in a simple, series circuit.
I can use straightforward scientific evidence to answer questions e.g. how do switches work?
Recognise some common conductors and insulators, and associate metals with being good conductors
I know that some common conductors and insulators, and associate metals with being good conductors.
I can set up a comparative test to identify which materials make good electrical conductors and which make good electrical insulators. I can use these results to draw simple conclusions, make links and identify patterns. I can use what they know to make a prediction. I can learn how scientists have explored, sought proof and used electricity (Benjamin Franklin) and how this has helped people (attracting lightning). I can record the method and table I am going to use. I can use findings to answer further questions, as scientists do.
Vocabulary: appliance, mains electricity, battery, generated, power station, plug, plug socket, electrical energy, series circuit, component, bulb (lamp), bulb (lamp) holder, buzzer, cell, wire, crocodile clip, switch, electrical conductor, electrical insulator
Animals, including humans (Formerly Year 4)
BIG IDEA 1. There is a relationship between structure and function 2. Living and non-living things can be grouped in a variety of ways 5. Living things have characteristics and requirements for life, growth and health 7. Living things depend on each other and on the environment; humans can have both a positive and negative impact
Enquiry Questions: 1. Why do we have different shaped teeth? 2. What can we tell about an animal from looking at its teeth? 3. What happens to our food when we eat it? 4. Can models help us understand human processes? 5. Why are food chains important?
Describe the simple functions of the basic parts of the digestive system in humans
I know the simple functions of the basic parts of the digestive system in humans (mouth, tongue, teeth, oesophagus, stomach, and small and large intestine).
I can create a model of the stomach to see the properties a stomach needs if the capacity needs to increase. I can set up a simple practical enquiry. I can make systematic and careful observations.

I can report on findings from enquiries, including oral/written explanations. I can create a model to show and explain a process (the digestive system).
Identify the different types of teeth in humans and their simple functions
I know the different types of teeth in humans (incisor, canine, molar, pre-molar) and their simple functions. I know the types of teeth (incisor, canine, molar, pre-molar) in different animals (carnivore, herbivore, omnivore) and their simple functions. I can collectively set up and monitor an experiment to see how different liquids affect our teeth. I can set up simple practical enquiries, comparatives and fair tests (eggshells in different liquids but kept in same place). I can collectively observe over time and draw conclusions. I can recognise when and how secondary sources might help me to answer questions that cannot be answered through practical investigations. I can make a judgement about an animal's diet by looking at its teeth.
Construct and interpret a variety of food chains, identifying producers, predators and prey
I know how to construct and interpret a variety of food chains, identifying producers, predators and prey. I know that food chains use arrows to show the movement of energy (food) through the food chain. I can sort living things according to their role in a food chain and then according to their habitat.
Vocabulary: teeth, incisors, molars, premolars, canines, revisit omnivore, herbivore and carnivore, adaptation, digestive system, mouth, tongue, oesophagus, stomach, small intestine, large intestine (NC); acids, nutrients, bloodstream, waste, rectum, anus, food chain, producer, primary/secondary/tertiary consumer, prey, predator, energy

LKS2 Assessment End Points	
Forces and Magnets (Formerly Year 3)	
Knowledge	Skills
I know that pushes and pulls are both examples of a contact force.	I can use observation to identify what kind of contact force is being used to move an object.

• I know that friction is a contact force that affects the movement of objects by acting in the opposite direction of the moving object. • I know that magnetism is a non-contact force and that magnets have two poles that may attract or repel. • I know that metals containing iron, steel and nickel will be attracted to a magnet. • I know that magnets can come in different forms and have different strengths.	• I can carry out a fair investigation using an agreed method and record their results to draw sensible conclusions. • I can observe a modelled experiment and use their emerging knowledge of magnets to make predictions. • I can follow a method to carry out a simple investigation and record their results. • I can write my own method and use this to carry out a simple investigation, including presenting results.
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Animals, including humans (Formerly Year 3)

Knowledge	Skills
• I know the names of and describe the different food groups that humans need to eat for a balanced diet. • I know that animals, such as pets, also have special dietary needs to keep them healthy. • I can describe the three main functions of the human skeleton, including naming the relevant parts that fulfill this. • I know that muscles allow the joints of a skeleton to move. • My investigations support me to understand how physical activity leads to greater fitness and stronger muscles.	• I can sort foods into accurate groups according to their type/nutritional value. • I can use a range of sources to find and present answers to questions. • I can identify and sort those animals with and without skeletons. • I can use models to support their scientific explanations of how muscles contract and relax. • I can conduct a simple pattern-seeking investigation to answer a scientific enquiry question.

Light (Formerly Year 3)

Knowledge	Skills
• I know that light is needed for us to see the world around us. • I know the difference between a light source and an object that is reflecting light. • I know about light sources and can link this to explain how shadows are formed. • I know the risks of looking into direct sunlight; and can extend this to explain some of the risks of UV rays. • I know how the position of the sun causes shadows to change size throughout the day.	• I can identify the difference between a light source and an object that is reflecting light. • I can accurately categorise objects in those that reflect light well and those that do not. • I can use my observations from different investigations to describe how the position and direction of a light source alters the size of a shadow. • I can identify through a simple enquiry which lenses would be most successful in protecting eyes from bright sunlight. • I can make careful observations and record results accurately to prove scientific ideas and processes.

Electricity (Formerly Year 4)

Knowledge	Skills
• I understand what precautions need to be taken with electricity (and why).	• I can explain how electricity is generated, distributed and converted. • I can set up a simple, practical inquiry and verbally report on findings.

• I know how to construct a simple series circuit, identifying and naming its basic parts, including a cell, wire, bulb, bulb holder. • I understand the function of a switch in a simple circuit. • I understand some common conductors and insulators, and associate metals with being good conductors. • I understand that a correctly built simple, series circuit creates a working device.	• I can identify changes related to simple scientific ideas, i.e. how a closed switch completes a circuit. • I can set up a comparative test and use their results to draw simple conclusions. • I can accurately record my findings using simple scientific language and drawings/labelled diagrams.
Animals, including Humans (Formerly Year 4)	
Knowledge	Skills
• I know the name and functions of incisors, canines, premolars and molars. • I can use precise vocabulary to explain how specific teeth suit the diet requirements of different animals. • I understand the simple functions of the digestive system using precise vocabulary to describe each stage. • I know how to construct and interpret a variety of food chains, identifying producers, predators and prey.	• I can identify how a practical enquiry will help me to find out how to look after my teeth. • I can explain how secondary sources (e.g. photos) help scientists to answer questions. • I can identify the importance of taking careful measurements when representing a scientific process. • I can use and apply my knowledge to create simple working models and use these to report the process to others. • I can use models, such as food chains, to understand the natural world, including sustainability.