

# Year 3 Statutory Requirements

Working Scientifically (Y3 & Y4)	Plants	Animals, including humans
<ul style="list-style-type: none"> <li>• asking relevant questions and using different types of scientific enquiries to answer them</li> <li>• setting up simple practical enquiries, comparative and fair tests</li> <li>• making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>• recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>• using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>	<ul style="list-style-type: none"> <li>• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>• explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</li> <li>• investigate the way in which water is transported within plants</li> <li>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>	<ul style="list-style-type: none"> <li>• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>

# Year 3 Statutory Requirements (continued)

Rocks	Light	Forces and Magnets
<ul style="list-style-type: none"> <li>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>recognise that soils are made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>recognise that they need light in order to see things and that dark is the absence of light</li> <li>notice that light is reflected from surfaces</li> <li>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>recognise that shadows are formed when the light from a light source is blocked by a solid object</li> <li>find patterns in the way that the size of shadows change.</li> </ul>	<ul style="list-style-type: none"> <li>compare how things move on different surfaces</li> <li>notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>describe magnets as having two poles</li> <li>predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>

# Science: Year 3 Overview

	<b>ANIMALS (including Humans)</b>	<b>PLANTS</b>	<b>LIGHT</b>	<b>FORCES and MAGNETS</b>	<b>ROCKS</b>
<b>YEAR 3</b>	<ul style="list-style-type: none"> <li>• Nutrition, linked to what we eat</li> <li>• Skeletons and muscles</li> </ul>	<ul style="list-style-type: none"> <li>• Function of different parts of plants</li> <li>• What different plants need to flourish</li> <li>• Journey of water through a plant</li> <li>• Life cycle of a plant</li> </ul>	<ul style="list-style-type: none"> <li>• Sources, including the Sun</li> <li>• Protecting eyes from the Sun</li> <li>• Shadows</li> <li>• Reflection /mirrors</li> </ul>	<ul style="list-style-type: none"> <li>• How magnets attract/repel some materials</li> <li>• Magnetic poles</li> <li>• Friction</li> </ul>	<ul style="list-style-type: none"> <li>• How rocks are formed</li> <li>• Different kinds of rocks</li> <li>• Fossils</li> <li>• Soil</li> </ul>
<b>Possible Learning Challenges</b>	<ul style="list-style-type: none"> <li>• How can Usain Bolt move so quickly?</li> </ul>	<ul style="list-style-type: none"> <li>• How did that blossom become an apple?</li> </ul>	<ul style="list-style-type: none"> <li>• How far can you throw your shadow?</li> </ul>	<ul style="list-style-type: none"> <li>• Are you attractive enough?</li> </ul>	<ul style="list-style-type: none"> <li>• What do rocks tell us about the way the Earth was formed?</li> </ul>

# Knowledge, Skills and Understanding breakdown for Working Scientifically

## Year 3

Planning	Obtaining and presenting evidence	Considering evidence and evaluating
<ul style="list-style-type: none"> <li>• Can they use different ideas and suggest how to find something out?</li> <li>• Can they make and record a prediction before testing?</li> <li>• Can they plan a fair test and explain why it was fair?</li> <li>• Can they set up a simple fair test to make comparisons?</li> <li>• Can they explain why they need to collect information to answer a question?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they measure using different equipment and units of measure?</li> <li>• Can they record their observations in different ways? &lt;labelled diagrams, charts etc&gt;</li> <li>• Can they describe what they have found using scientific language?</li> <li>• Can they make accurate measurements using standard units?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they explain what they have found out and use their measurements to say whether it helps to answer their question?</li> <li>• Can they use a range of equipment (including a data-logger) in a simple test?</li> </ul>

## Year 3 (Challenging)

<ul style="list-style-type: none"> <li>• Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they explain their findings in different ways (display, presentation, writing)?</li> <li>• Can they use their findings to draw a simple conclusion?</li> <li>• Can they suggest improvements and predictions for further tests?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they suggest how to improve their work if they did it again?</li> </ul>
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# Knowledge, Skills and Understanding breakdown for Plants and Animals, including Humans

## Year 3

### Animals, including humans

- Can they explain the importance of a nutritionally balanced diet?
- Can they describe how nutrients, water and oxygen are transported within animals and humans?
- Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat?
- Can they describe and explain the skeletal system of a human?
- Can they describe and explain the muscular system of a human?

### Plants

- Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)?
- Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)?
- Can they explain how they vary from plant to plant?
- Can they investigate the way in which water is transported within plants?
- Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?

## Year 3 (Challenging)

- Can they explain how the muscular and skeletal systems work together to create movement?
- Can they classify living things and non-living things by a number of characteristics that they have thought of?
- Can they explain how people, weather and the environment can affect living things?
- Can they explain how certain living things depend on one another to survive?

- Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?

# Knowledge, Skills and Understanding breakdown for Rocks

## Year 3

### Rocks

- Can they compare and group together different rocks on the basis of their appearance and simple physical properties?
- Can they describe and explain how different rocks can be useful to us?
- Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed?
- Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock?
- Can they recognise that soils are made from rocks and organic matter?

## Year 3 (Challenging)

- Can they classify igneous and sedimentary rocks?
- Can they begin to relate the properties of rocks with their uses?

# Knowledge, Skills and Understanding breakdown for Light, Forces and Magnets

## Year 3

### Forces and magnets

- Can they compare how things move on different surfaces?
- Can they observe that magnetic forces can be transmitted without direct contact?
- Can they observe how some magnets attract or repel each other?
- Can they classify which materials are attracted to magnets and which are not?
- Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance?
- Can they compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet?
- Can they identify some magnetic materials?
- Can they describe magnets have having two poles (N & S)?
- Can they predict whether two magnets will attract or repel each other depending on which poles are facing?

### Light

- Can they recognise that they need light in order to see things?
- Can they recognise that dark is the absence of light?
- Can they notice that light is reflected from surfaces?
- Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes?
- Can they recognise that shadows are formed when the light from a light source is blocked by a solid object?
- Can they find patterns in the way that the size of shadows change?

## Year 3 (Challenging)

- Can they investigate the strengths of different magnets and find fair ways to compare them?
- Can they explain why lights need to be bright or dimmer according to need?
- Can they explain the difference between transparent, translucent and opaque?
- Can they explain why lights need to be bright or dimmer according to need?
- Can they make a bulb go on and off?
- Can they say what happens to the electricity when more batteries are added?
- Can they explain why their shadow changes when the light source is moved closer or further from the object?

# Year 3: How can Usain Bolt move so quickly?

## Year 3: Science and Art Knowledge, Skills and Understanding

### Science

#### Animals, including Humans

- Can they make and record a prediction before testing?
- Can they measure using different equipment and units of measure?
- Can they record their observations in different ways? (labelled diagrams, charts etc.)
- Can they describe what they have found using scientific words?
- Can they make accurate measurements using standard units?
- Can they explain what they have found out and use their measurements to say whether it helps to answer their question?
  
- Can they explain the importance of a nutritious balanced diet?
- Can they describe how nutrients, water and oxygen are transported within animals and humans?
- Can they describe and explain the skeletal system of a human?
- Can they describe and explain the muscular system of a human?

### Art & Design

- Can they use their sketches to produce a final piece of work?
- Can they write an explanation of their sketch in notes?
- Can they use different grades of pencil shade, show different tones, show tone and texture?
- Can they make notes in their sketch book about techniques used by artists?
- Can they suggest improvements to their work by keeping notes in their sketch books?
- Can they show proportion when drawing the face or the whole body?

## Year 3 (Challenging)

- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts, keys and tables?
- Can they explain their findings in different ways (display, presentation, writing)?
- Can they use their findings to draw a simple conclusion?
  
- Can they explain how the muscular and skeletal systems work together to create movement?



# Year 3: How did that blossom become an apple?

## Year 3: Science, Art and DT Knowledge, Skills and Understanding

### Science - Plants

- Can they record their observations in different ways? (labelled diagrams, charts etc.)
- Can they describe what they have found using scientific words?
- Can they identify and describe the functions of different parts of plants? (roots, stem, leaves and flowers)
- Can they identify what a plants needs for life and growth?
- Can they describe the ways in which nutrients, water and oxygen are transported within plants?
- Can they explain how the needs and functions of plant parts vary from plant to plant e.g. insect and wind pollinated plants?
- Can they investigate the way in which water is transported within plants?

### Art & Design

- Can they predict with accuracy the colours that they mix?
- Do they know where each of the primary and secondary colours sits on the colour wheel?
- Can they create a background using a wash?
- Can they use a range of brushes to create different effects?
- Can they use their sketch books to express feelings about a subject and to describe likes and dislikes?
- Can they make notes in their sketch book about techniques used by artists?
- Can they suggest improvements to their work by keeping notes in their sketch books?
- Can they explore work from other periods of time?
- Are they beginning to understand the viewpoints of others by looking at images of people and understand how they are feeling and what the artist is trying to express in their work?

### Year 3 (Challenging)

- Can they explain their findings in different ways (display, presentation, writing)?
- Can they use their findings to draw a simple conclusion?
- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts, keys and tables?
- Can they classify a range of common plants according to many criteria (environment found, size, climate required, etc.)?
- Can they explore the role of flowers in the life cycle of flowering plants. Including pollination, seed formation and seed dispersal?

### Design Technology

- Can they show that their design meets a range of requirements?
- Can they put together a step-by-step plan which shows the order and also what equipment and tools they need?
- Can they describe their design using an accurately labelled sketch and words?
- How realistic is their plan?
- Can they use equipment and tools accurately?
- What did they change which made their design even better?

# Year 3: How far can you throw your shadow?

## Year 3: Science, Art and DT Knowledge, Skills and Understanding

### Science - Light

- Can they make and record a prediction before testing?
- Can they measure using different equipment and units of measure?
- Can they record their observations in different ways? (labelled diagrams, charts etc.)
- Can they describe what they have found using scientific words?
- Can they make accurate measurements using standard units?
- Can they explain what they have found out and use their measurements to say whether it helps to answer their question?
- Can they explain what dark is using words like shadow?

### Art & Design

- Can they predict with accuracy the colours that they mix?
- Do they know where each of the primary and secondary colours sits on the colour wheel?
- Can they create a background using a wash?
- Can they use a range of brushes to create different effects?
- Can they use their sketch books to express feelings about a subject and to describe likes and dislikes?
- Can they make notes in their sketch book about techniques used by artists?
- Can they suggest improvements to their work by keeping notes in their sketch books?
- Can they explore work from other periods of time?
- Are they beginning to understand the viewpoints of others by looking at images, people and understand how they are feeling and what the artist is trying to express in their work?

### Year 3 (Challenging)

- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts, keys and tables?
- Can they explain their findings in different ways (display, presentation, writing)?
- Can they use their findings to draw a simple conclusion?
  
- Can they explain why lights need to be bright or dimmer according to need?
- Can they explain why their shadow changes when the light source is moved closer or further from the object?

### Design Technology

- Can they show that their design meets a range of requirements?
- Can they put together a step-by-step plan which shows the order and also what equipment and tools they need?
- Can they describe their design using an accurately labelled sketch and words?
- How realistic is their plan?
- Can they use equipment and tools accurately?
- What did they change which made their design even better?

## Year 3: Are you attractive enough?

### Year 3: Science and DT Knowledge, Skills and Understanding

#### Science – Forces and Magnets

- Can they use different ideas and suggest how to find something out?
- Can they make and record a prediction before testing?
- Can they plan a fair test and explain why it was fair?
- Can you set up a simple fair test to make comparisons?
- Can they explain why they need to collect information to answer a question?
  
- Can they observe that magnetic forces can be transmitted without direct contact?
- Can they talk about how some magnets attract or repel each other?
- Can they classify which materials are attracted to magnets?
- Can they describe the speed and direction of moving objects?

#### Design Technology

- Do they select the most appropriate tools and techniques to use for a given task?
- Can they show that their design meets a range of requirements?
- Can they put together a step-by-step plan which shows the order and also what equipment and tools they need?
- Can they describe their design using an accurately labelled sketch and words?
- How realistic is their plan?
- Can they use equipment and tools accurately?
- What did they change which made their design even better?

#### Year 3 (Challenging)

- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts, keys and tables?
  
- Can they investigate the strengths of different magnets and find fair ways to compare them?
- Can they explain why an object will move faster if it is rolling down a hill or a slope?

## Short Unit

### Year 3: What do rocks tell us about the way the Earth was formed?

#### Year 3: Science and Art Knowledge, Skills and Understanding

##### Science – Rocks

- Can they compare and group together different rocks based on their simple physical properties?
- Can they describe and explain how different rocks can be useful to us?
- Can they describe how fossils are formed?
- Can they recognise that soils are formed from rocks and organic matter?

##### Art & Design

- Can they add onto their work to create texture and shape?
- Can they work with life size materials?
- Can they use their sketch books to express feelings about a subject and to describe likes and dislikes?
- Can they make notes in their sketch books about techniques used by artists?
- Can they suggest improvements to their work by keeping notes in their sketch books?

#### Year 3 (Challenging)

- Can they classify igneous and sedimentary rocks?
- Can they begin to relate the properties of rocks with their uses?

# Year 4 Statutory Requirements

Working Scientifically (Y3 & Y4)	Living Things and their Habitats	Animals, including humans
<ul style="list-style-type: none"> <li>• asking relevant questions and using different types of scientific enquiries to answer them</li> <li>• setting up simple practical enquiries, comparative and fair tests</li> <li>• making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>• recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>• using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>	<ul style="list-style-type: none"> <li>• recognise that living things can be grouped in a variety of ways</li> <li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>• recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<ul style="list-style-type: none"> <li>• describe the simple functions of the basic parts of the digestive system in humans</li> <li>• identify the different types of teeth in humans and their simple functions</li> <li>• construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>

# Year 4 Statutory Requirements (continued)

States of Matter	Sound	Electricity
<ul style="list-style-type: none"> <li>compare and group materials together, according to whether they are solids, liquids or gases</li> <li>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)</li> <li>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>identify how sounds are made, associating some of them with something vibrating</li> <li>recognise that vibrations from sounds travel through a medium to the ear</li> <li>find patterns between the pitch of a sound and features of the object that produced it</li> <li>find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>	<ul style="list-style-type: none"> <li>identify common appliances that run on electricity</li> <li>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>

# Science: Year 4 Overview

	<b>ANIMALS, including Humans</b>	<b>LIVING THINGS and their Habitats</b>	<b>STATES OF MATTER</b>	<b>ELECTRICITY</b>	<b>SOUND</b>
<b>YEAR 4</b>	<ul style="list-style-type: none"> <li>• Digestive System</li> <li>• Teeth</li> <li>• Food chains</li> <li>• Predators and prey</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and name a variety of living things (plants and animals) in the local and wider environment and group them</li> <li>• Recognise that environments can change and can pose dangers</li> </ul>	<ul style="list-style-type: none"> <li>• Solids, Liquids and Gases</li> <li>• Heating and cooling (no baking, etc.)</li> <li>• Evaporation and condensation</li> </ul>	<ul style="list-style-type: none"> <li>• Identify common appliances</li> <li>• Construct simple circuits including switches</li> <li>• Common conductors and insulators</li> <li>• Alternative sources of energy</li> </ul>	<ul style="list-style-type: none"> <li>• Sources</li> <li>• Vibration</li> <li>• Loud and faint</li> <li>• Pitch</li> <li>• Volume</li> <li>• Sound travelling</li> </ul>
<b>Possible Learning Challenges</b>	<ul style="list-style-type: none"> <li>• <b>What happens to the food we eat?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Which wild animals and plants thrive in your locality?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>How would we survive without water?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>How could we cope without electricity for one day?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Why is the sound that 'One Direction' makes enjoyed by so many?</b></li> </ul>

# Knowledge, Skills and Understanding breakdown for Working Scientifically

## Year 4

Planning	Obtaining and presenting evidence	Considering evidence and evaluating
<ul style="list-style-type: none"> <li>• Can they set up a simple fair test to make comparisons?</li> <li>• Can they plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated?</li> <li>• Can they suggest improvements and predictions?</li> <li>• Can they decide which information needs to be collected and decide which is the best way for collecting it?</li> <li>• Can they use their findings to draw a simple conclusion?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they take measurements using different equipment and units of measure and record what they have found in a range of ways?</li> <li>• Can they make accurate measurements using standard units?</li> <li>• Can they explain their findings in different ways (display, presentation, writing)?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they find any patterns in their evidence or measurements?</li> <li>• Can they make a prediction based on something they have found out?</li> <li>• Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables?</li> <li>• Can they use straightforward scientific evidence to answer questions or to support their findings?</li> <li>• Can they identify differences, similarities or changes related to simple scientific ideas or processes?</li> </ul>

## Year 4 (Challenging)

<ul style="list-style-type: none"> <li>• Can they plan and carry out an investigation by controlling variables fairly and accurately?</li> <li>• Can they use test results to make further predictions and set up further comparative tests?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they report findings from investigations through written explanations and conclusions?</li> <li>• Can they use a graph or diagram to answer scientific questions?</li> </ul>
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# Knowledge, Skills and Understanding breakdown for Living Things, their Habitats and Animals, including humans

## Year 4

### Animals, including humans

- Can they identify and name the basic parts of the digestive system in humans?
- Can they describe the simple functions of the basic parts of the digestive system in humans?
- Can they identify the simple function of different types of teeth in humans?
- Can they compare the teeth of herbivores and carnivores?
- Can they explain what a simple food chain shows?
- Can they construct and interpret a variety of food chains, identifying producers, predators and prey?

### Living Things and their Habitats

- Can they recognise that living things can be grouped in a variety of ways?
- Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates)
- Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric)
- Do they recognise that environments can change and this can sometimes pose a danger to living things?

## Year 4 (Challenging)

- Can they classify living things and non-living things by a number of characteristics that they have thought of?
- Can they explain how people, weather and the environment can affect living things?
- Can they explain how certain living things depend on one another to survive?

- Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment?
- Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus)
- Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore)

# Knowledge, Skills and Understanding breakdown for States of Matter

## Year 4

### States of Matter

- Can they compare and group materials together, according to whether they are solids, liquids or gases?
- Can they explain what happens to materials when they are heated or cooled?
- Can they measure or research the temperature at which different materials change state in degrees Celsius?
- Can they use measurements to explain changes to the state of water?
- Can they identify the part that evaporation and condensation has in the water cycle?
- Can they associate the rate of evaporation with temperature?

### Year 4 (Challenging)

- Can they group and classify a variety of materials according to the impact of temperature on them?
- Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line?
- Can they relate temperature to change of state of materials?

# Knowledge, Skills and Understanding breakdown for Sound and Electricity

## Year 4

### Sound

- Can they describe a range of sounds and explain how they are made?
- Can they associate some sounds with something vibrating?
- Can they compare sources of sound and explain how the sounds differ?
- Can they explain how to change a sound (louder/softer)?
- Can they recognise how vibrations from sound travel through a medium to a ear?
- Can they find patterns between the pitch of a sound and features of the object that produce it?
- Can they find patterns between the volume of the sound and the strength of the vibrations that produced it?
- Can they recognise that sounds get fainter as the distance from the sound source increases?
- Can they explain how you could change the pitch of a sound?
- Can they investigate how different materials can affect the pitch and volume of sounds?

### Electricity

- Can they identify common appliances that run on electricity?
- Can they construct a simple series electric circuit?
- Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers?
- Can they 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?
- Can they recognise that a switch opens and closes a circuit?
- Can they associate a switch opening with whether or not a lamp lights in a simple series circuit?
- Can they recognise some common conductors and insulators?
- Can they associate metals with being good conductors?

## Year 4 (Challenging)

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| <ul style="list-style-type: none"><li>• Can they explain why sound gets fainter or louder according to the distance?</li><li>• Can they explain how pitch and volume can be changed in a variety of ways?</li><li>• Can they work out which materials give the best insulation for sound?</li></ul> | <ul style="list-style-type: none"><li>• Can they explain how a bulb might get lighter?</li><li>• Can they recognise if all metals are conductors of electricity?</li><li>• Can they work out which metals can be used to connect across a gap in a circuit?</li><li>• Can they explain why cautions are necessary for working safely with electricity?</li></ul> |
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# Year 4: What happens to the food we eat?

## Year 4: Science, Art and DT Knowledge, Skills and Understanding

### Year 4 Science: Animals, including humans

- Can they take measurements using different equipment and units of measure and record what they have found in a range of ways?
- Can they make accurate measurements using standard units?
- Can they explain their findings in different ways (display, presentation, writing)?
- Can they make a prediction based on something they have found out?
- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts and tables?
- Can they identify and name the basic parts of the human digestive system?
- Can they describe the function of the organs of the human digestive system?
- Can they identify the simple function of different types of human teeth?
- Can they compare the teeth of herbivores and carnivores?
- Can they explain what a simple food chain shows?

### Year 4 Science: (Challenging)

- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph or diagram to answer scientific questions?

### Art & Design : Drawing

- Can they begin to show facial expressions and body language in their sketches?
- Can they identify and draw simple objects, and use marks and lines to produce texture?
- Can they organise line, tone, shape and colour to represent figures and forms in movement?
- Can they show reflections?
- Can they explain why they have chosen specific materials to draw with?

### Design Technology

- Can they come up with at least one idea about how to create their product?
- Do they take account of the ideas of others when designing?
- Can they produce a plan and explain it to others?
- Can they suggest some improvements and say what was good and not so good about their original design?
- Can they tell if their finished product is going to be good quality?
- Are they conscious the need to produce something that will be liked by others?
- Can they show a good level of expertise when using a range of tools and equipment?
- Have they thought of how they will check if their design is successful?
- Can they begin to explain how they can improve their original design?
- Can they evaluate their product, thinking of both its appearance and the way it works?

# Year 4: Which wild animals and plants will we find in your locality?

## Year 4: Science, Art and DT Knowledge, Skills and Understanding

### Year 4 Science: All Living Things

- Can they take measurements using different equipment and units of measure and record what they have found in a range of ways?
- Can they make accurate measurements using standard units?
- Can they explain their findings in different ways (display, presentation, writing)?
- Can they find any patterns in their evidence or measurements?
- Can they make a prediction based on something they have found out?
- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts and tables?
  
- Can they use a classification key to group a variety of living things? (plants, vertebrates, invertebrates)
- Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric)
- Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore)

### Year 4 Challenging

- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph or diagram to answer scientific questions?

### Art & Design

- Can they create all the colours they need?
- Can they create mood in their paintings?
- Do they successfully use shading to create mood and feeling?
- Can they use their sketch books to express their feelings about various subjects and outline likes and dislikes?
- Can they produce a montage all about themselves?
- Do they use their sketch books to adapt and improve their original ideas?
- Do they keep notes about the purpose of their work in their sketch books?

### Design Technology

- Can they come up with at least one idea about how to create their product?
- Do they take account of the ideas of others when designing?
- Can they produce a plan and explain it others?
- Can they suggest some improvements and say what was good and not so good about their original design?
- Can they tell if their finished product is going to be good quality?
- Are they conscious of the need to produce something that will be liked by others?
- Can they show a good level of expertise when using a range of tools and equipment?
- Have they thought of how they will check if their design is successful?
- Can they begin to explain how they can improve their original design?
- Can they evaluate their product, thinking of both appearance and the way it works?

## Year 4: How would we survive without water?

### Year 4: Science and Dance Knowledge, Skills and Understanding

#### Year 4 Science: States of Matter

- Can they set up a simple fair test to make comparisons?
- Can they plan a fair test and isolate variables and explain why it was fair and explain which variables have been isolated?
- Can they suggest improvements and predictions?
- Can they decide which information needs to be collected and decide which is the best way for collecting it?
- Can they use their findings to draw a simple conclusion?
  
- Can they compare and group materials based on their states of matter, ie, liquid, solid or gas?
- Can they explain what happens to materials when they are heated or cooled?
- Can they measure the temperature at which different materials change state?
- Can they use measurements to explain changes to the state of water?
- Can they link changes of state to the water cycle?

#### Year 4 Challenging

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they use test results to make further predictions and set up further comparative tests?
  
- Can they group and classify a variety of materials according to the impact of temperature on them?
- Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line?
- Can they relate temperature to change of state of materials?

#### Dance

- Can they respond imaginatively to a range of stimuli related to character and narrative?
- Do they use simple motifs and movement patterns to structure dance phrases on their own, with a partner and in a group?
- Can they refine, repeat and remember dance phrases and dances?
- Can they perform dances clearly and fluently?
- Can they show sensitivity to the dance idea and the accompaniment?
- Do they show a clear understanding of how to warm-up and cool-down safely?
- Do they describe, interpret and evaluate dance, using appropriate language?

#### Challenging

- Can they structure and vary longer dances?
- Do they develop movement ideas for others?
- Do they show a good sense of rhythm and style when performing?
- Can they remember and perform a range of warm-up and cool-down activities?
- Can they give reasons why physical activity is good for health?
- Do they use a range of dance vocabulary to describe, interpret and evaluate dance?

# Year 4: How could we cope without electricity for one day?

## Year 4: Science and DT Knowledge, Skills and Understanding

### Year 4 Science: Electricity

- Can they set up a simple fair test to make comparisons?
- Can they plan a fair test and isolate variables and explain why it was fair and explain which variables have been isolated?
- Can they suggest improvements and predictions?
- Can they decide which information needs to be collected and decide which is the best way for collecting it?
- Can they use their findings to draw a simple conclusion?
  
- Can they explain how electricity is useful to us?
- Can they construct a simple circuit?
- Can they explain what a conductor is and test materials for conductivity?
- Can they explain closed and open circuits?
- Can they construct a circuit with a switch?
- Can they recognise some common conductors and insulators?

### Year 4 Challenging

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they use test results to make further predictions and set up further comparative tests?
  
- Can they explain how a bulb might get lighter?
- Can they recognise if all metals are conductors of electricity?
- Can they work out which metals can be used to connect across a gap in a circuit?

### Design Technology

- Can they come up with at least one idea about how to create their product?
- Do they take account of the ideas of others when designing?
- Can they produce a plan and explain it to others?
- Can they suggest some improvements and say what was good and not so good about their original design?
- Can they tell if their finished product is going to be good quality?
- Are they conscious of the need to produce something that will be liked by others?
- Can they show a good level of expertise when using a range of tools and equipment?
- Have they thought of how they will check if their design is successful?
- Can they begin to explain how they can improve their original design?
- Can they evaluate their product, thinking of both its appearance and the way it works?
- **Food Technology:** Do they know what to do to be hygienic and safe?
- Have they thought what they can do to present their product in an interesting way?
- **Using materials:** Can they measure carefully so as to make sure they have not made mistakes?
- How have they attempted to make their product strong?

# Year 4: Why is the sound that 'One Direction' makes enjoyed by so many?

## Year 4: Science and Music Knowledge, Skills and Understanding

### Year 4 Science: Sound

- Can they take measurements using different equipment and units of measure and record what they have found in a range of ways?
- Can they make accurate measurements using standard units?
- Can they explain their findings in different ways (display, presentation, writing)?
- Can they find any patterns in their evidence or measurements?
- Can they make a prediction based on something they have found out?
- Can they record and present what they have found using scientific language, drawings, labeled diagrams, bar charts, keys and tables?
  
- Can they describe a range of sounds and explain how they are made?
- Can they compare sources of sound and explain how the sounds differ?
- Can they explain how to change a sound (louder/softer)?
- Can they describe and explain how a sound travels from a source to our ears?
- Can they explain what happens to sound as it travels away from its source?
- Can they explain how you could change the pitch of a sound?
- Can they investigate how different materials can affect the pitch and volume of sounds?

### Music

- Can they explain the place of silence and say what effect it has?
- Can they start to identify the character of a piece of music?
- Can they describe and identify the different purposes of music?
- Can they begin to identify with the style of work of Beethoven, Mozart and Elgar?
- Can they perform a simple part rhythmically?
- Can they sing songs from memory with accurate pitch?
- Can they improvise using repeated patterns?

### Year 4 Challenging

- Can they explain why sound gets fainter or louder according to the distance?
- Can they explain how pitch and volume can be changed in a variety of ways?
- Can they work out which materials give the best insulation for sound?



# Year 5 Statutory Requirements

Working Scientifically (Y5 & Y6)	Living Things and their habitats	Animals, including humans
<ul style="list-style-type: none"> <li>planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> <li>identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>describe the life process of reproduction in some plants and animals.</li> </ul>	<ul style="list-style-type: none"> <li>describe the changes as humans develop to old age.</li> </ul>

# Year 5 Statutory Requirements (continued)

Properties and changes of materials	Earth and Space	Forces
<ul style="list-style-type: none"> <li>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> <li>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> </ul>	<ul style="list-style-type: none"> <li>describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>describe the movement of the Moon relative to the Earth</li> <li>describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>	<ul style="list-style-type: none"> <li>explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul>

# Science: Year 5 Overview

	Living things and their habitats	Animals, including humans	Properties & changes of materials	Earth and space	Forces
<b>YEAR 5</b>	<ul style="list-style-type: none"> <li>• Life cycles of plants and animals</li> <li>• Birth, growth, development and reproduction</li> </ul>	<ul style="list-style-type: none"> <li>• Changes as humans develop from birth to old age</li> </ul>	<ul style="list-style-type: none"> <li>• Dissolving</li> <li>• Evaporating</li> <li>• Filtering</li> <li>• Reversible and Irreversible changes</li> </ul>	<ul style="list-style-type: none"> <li>• Earth relative to the Sun</li> <li>• Moon relative to the Earth</li> <li>• Relationship between Sun, Earth and Moon</li> <li>• Earth's rotation</li> <li>• Day and night</li> </ul>	<ul style="list-style-type: none"> <li>• Gravity</li> <li>• Air Resistance</li> <li>• Water Resistance</li> <li>• Friction</li> <li>• Gears, Pulleys, Leavers and Springs</li> </ul>
<b>Possible Learning Challenges</b>	<ul style="list-style-type: none"> <li>• Do all animals and plants start life as an egg?</li> </ul>	<ul style="list-style-type: none"> <li>• How different will you be when you are as old as your grandparents?</li> </ul>	<ul style="list-style-type: none"> <li>• Could you be the next CSI investigator?</li> </ul>	<ul style="list-style-type: none"> <li>• Will we ever send another human to the moon?</li> </ul>	<ul style="list-style-type: none"> <li>• Can you feel the force?</li> </ul>

# Knowledge, Skills and Understanding breakdown for Working Scientifically

## Year 5

Planning	Obtaining and presenting evidence	Considering evidence and evaluating
<ul style="list-style-type: none"> <li>• Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary?</li> <li>• Can they make a prediction with reasons?</li> <li>• Can they use test results to make predictions to set up comparative and fair tests?</li> <li>• Can they present a report of their findings through writing, display and presentation?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they take measurements using a range of scientific equipment with increasing accuracy and precision?</li> <li>• Can they take repeat readings when appropriate?</li> <li>• Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they report and present findings from enquiries through written explanations and conclusions?</li> <li>• Can they use a graph to answer scientific questions?</li> </ul>

## Year 5 (Challenging)

<ul style="list-style-type: none"> <li>• Can they explore different ways to test an idea, choose the best way and give reasons?</li> <li>• Can they vary one factor whilst keeping the others the same in an experiment?</li> <li>• Can they use information to help make a prediction?</li> <li>• Can they explain, in simple terms, a scientific idea and what evidence supports it?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they decide which units of measurement they need to use?</li> <li>• Can they explain why a measurement needs to be repeated?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they find a pattern from their data and explain what it shows?</li> <li>• Can they link what they have found out to other science?</li> <li>• Can they suggest how to improve their work and say why they think this?</li> </ul>
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# Knowledge, Skills and Understanding breakdown for Living Things, their Habitats and Animals, including humans

## Year 5

### Animals, including humans

- Can they describe the changes as humans develop to old age?

### Living things and their habitats

- Can they describe the differences in the life cycles of a mammal, an amphibians, an insects and a bird?
- Can they describe the life cycles of common plants?
- Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall)

## Year 5 (Challenging)

- Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies?
- Can they describe the changes experienced in puberty?
- Can they draw a timeline to indicate stages in the growth and development of humans?

- Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border?
- Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?

# Knowledge, Skills and Understanding breakdown for Properties and Changes to Materials

## Year 5

### Properties and changes to materials

- Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets?
- Can they explain how some materials dissolve in liquid to form a solution?
- Can they describe how to recover a substance from a solution?
- Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating?
- Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic?
- Can they describe changes using scientific words? (evaporation, condensation)
- Can they demonstrate that dissolving, mixing and changes of state are reversible changes?
- Can they explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda?
- Can they use the terms 'reversible' and 'irreversible'?

### Year 5 (challenging)

- Can they describe methods for separating mixtures? (filtration, distillation)
- Can they work out which materials are most effective for keeping us warm or for keeping something cold?
- Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases)
- Can they explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda?
- Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?

# Knowledge, Skills and Understanding breakdown for Earth, Space and Forces

## Year 5

### Earth and Space

- Can they identify and explain the movement of the Earth and other planets relative to the sun in the solar system?
- Can they explain how seasons and the associated weather is created?
- Can they describe and explain the movement of the Moon relative to the Earth?
- Can they describe the sun, earth and moon as approximately spherical bodies?
- Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky?

### Forces

- Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object?
- Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces?
- Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect?

## Year 5 (Challenging)

- Can they compare the time of day at different places on the earth?
- Can they create shadow clocks?
- Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge?
- Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)

- Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)
- Can they design very effective parachutes?
- Can they work out how water can cause resistance to floating objects?
- Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?

## Year 5: Do all animals and plants start life as an egg?

### Year 5: Science, Art, Music and Dance Knowledge, Skills and Understanding

#### Year 5 Science: Living Things and their habitats

- Can they describe and compare the life cycles of a range of animals, including humans, amphibians, insects and birds?
- Can they describe the life cycles of common plants?
- Can they talk with knowledge about birth, reproduction and death of familiar animals or plants?
- Can they explore the work of well know naturalists? (David Attenborough and Jane Goodall)
- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?

#### Art & Design

- Do they experiment with and combine materials and processes to design and make 3D form?
- Do they learn about the work of others by looking at their work in books, the Internet, visits to galleries and other sources of information?
- Do they keep notes in their sketch books as to how they might develop their work further?
- Do they use their sketch books to compare and discuss ideas with others?
- Can they combine visual and tactile qualities?

#### Year 5 Challenging

- Can they observe their local environment and draw conclusions about life-cycles? (for example, the vegetable garden or flower border)
- Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, eg rainforests?
- Can they explain (in simple terms) a scientific idea and what evidence supports it?

#### Music and Dance

- Can they change sounds or organise them differently to change the effect?
- Can they compose music which meets specific criteria?
- Can they choose the most appropriate tempo for a piece of music?
- Do they plan and perform dances confidently?
- Can they compose motifs and plan dances creatively and collaboratively in groups?
- Can they adapt and refine the way they use weight, space and rhythm in their dances to express themselves in the style of dance they use?
- Can they perform different styles of dance clearly and fluently?
- Do they organise their own warm-up and cool-down exercises?



# Year 5: How different will you be when you are as old as your grandparents?

## Year 5: Science and Art Knowledge, Skills and Understanding

### Year 5 Science: Animals (including Humans)

- Can they create a timeline to indicate stages of growth in humans?
- Can they explain what puberty is? (non statutory)
- Do they appreciate that all animals will eventually die?
- Can they explain why different animals have a different life expectancy?
  
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- Can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?

### Art & Design

- Do they successfully use shading to create mood and feeling?
- Can they organise line, tone, shape and colour to represent figures and forms in movement?
- Can they explain why they have chosen specific materials to draw with?
- Can they create all the colours they need?
- Can they create mood in their paintings?
- Can they express their emotions accurately through their painting and sketches?
- Do they keep notes in their sketch books as to how they might develop their work further?
- Do they use their sketch books to compare and discuss ideas with others?
- Do they learn about the work of others by looking at their work in books, the Internet, visits to galleries and other sources of information?

### Year 5 Challenging

- Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies?
  
- Can they explain (in simple terms) a scientific idea and what evidence supports it?
- Can they decide which units of measurement they need to use?
- Can they explain why a measurement needs to be repeated?
- Can they find a pattern from their data and explain what it shows?
- Can they link what they have found out to other science?
- Can they suggest how to improve their work and say why they think this?

# Year 5: Could you be the next CSI investigator?

## Year 5: Science and Art Knowledge, Skills and Understanding

### Year 5 Science: Materials

- Can they explore different ways to test an idea and choose the best way, and give reasons?
- Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?
- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use information to help make a prediction?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they explain (in simple terms) a scientific idea and what evidence supports it?
- Can they present a report of their findings through writing, display and presentation?
  
- Can they explain how changes can result in the formation of new materials?
- Can they explain what an irreversible change is and give examples?
- Can they explore the work of famous chemists? (Lavoisier, Priestley, Spencer Silver or Ruth Benerito)
- Can they distinguish metals from other solid materials by describing metallic properties?
- Can they explain why some metals rust?
- Can they explain what happens when vinegar or bicarbonate of soda is added to materials?

### Year 5 Challenging

- Can they make a prediction which links with other scientific knowledge?
- Can they identify the key factors when planning a fair test?
- Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough?
  
- Can they identify where changes in state take place and explain these?
- Can they give a clear description of what happens when a material is burnt or heated as in cooking?
- Can they give examples of how chemical changes can impact on our lives?
- Can they suggest ways to separate mixtures based on what they know about certain materials?

### Art & Design

- Do their sketch books contain detailed notes, and quotes explaining about items?
- Do they compare their methods to those of others and keep notes in their sketch books?
- Do they combine graphics and text based research of commercial design, for example magazines etc., to influence the layout of their sketch books.
- Do they adapt and refine their work to reflect its meaning and purpose, keeping notes and annotations in their sketch books?
- Can they create work which is open to interpretation by the audience?
- Can they include both visual and tactile elements in their work?
- Can they combine pattern, tone and shape?
- Can they overprint using different colours?
- Do they look very carefully at the methods they use and make decisions about the effectiveness of their printing methods?

## Year 5: Will we ever send another human to the moon?

### Year 5: Science and DT Knowledge, Skills and Understanding

#### Year 5 Science: Earth and Space

- Can they identify and explain the movement of the Earth relative to the Sun?
- Can they explain how seasons and the associated weather are created?
- Can they identify and explain the movement of the Moon relative to the Earth?
- Can they explain the size, shape and position of the Earth, Sun and Moon?
- Can they explain how night and day are created and use diagrams to show this?
- Can they explain how planets are linked to stars?

#### Year 5 Challenging

- Can they compare the time of day at different places on the Earth?
- Can they create shadow clocks?
- Can they begin to understand how older civilizations used the Sun to create astronomical clocks?
- Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)

#### Design & Technology

- Can they come up with a range of ideas after they have collected information?
- Do they take a user's view into account when designing?
- Can they produce a detailed step-by-step plan?
- Can they suggest some alternative plans and say what the good points and drawbacks are about each?
- Can they explain why their finished product is going to be of good quality?
- Can they explain how their product will appeal to the audience?
- Can they use a range of tools and equipment expertly?
- Do they keep checking that their design is the best it can be?
- Do they check whether anything could be improved?
- Can they evaluate appearance and function against the original criteria?
- **Using materials:** Are their measurements accurate enough to ensure that everything is precise?
- How have they ensured that their product is strong and fit for purpose?
- Are they motivated enough to refine and improve their product?
- Do they persevere through different stages of the making process?

# Year 5: Can you feel the force?

## Year 5: Science and DT Knowledge, Skills and Understanding

### Year 5 Science: Forces

- Can they explore different ways to test an idea, choose the best way, and give reasons?
- Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?
- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use information to help make a prediction?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they explain (in simple terms) a scientific idea and what evidence supports it?
- Can they present a report of their findings through writing, display and presentation?
  
- Can they explain what gravity is and its impact on our lives?
- Can they explain why a wheeled object that is initially pushed will slow down and stop?
- Can they explain the impact of friction on a moving object?
- Can they explain the effect of drag force on moving objects?
- Can they explain how force and motion can be transferred through gears, pulleys, levers and springs?

### Year 5 Challenging

- Can they make a prediction which links with other scientific knowledge?
- Can they identify the key factors when planning a fair test?
- Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough?
  
- Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)
- Can they design very effective parachutes?
- Can they work out how water can cause resistance to floating objects?

### Design & Technology

- Can they use a range of information to inform their design?
- Can they use market research to inform plans?
- Can they work within constraints?
- Can they follow and refine their plan if necessary?
- Can they justify their plan to someone else?
- Do they consider culture and society in their designs?
- Can they use tools and materials precisely?
- Do they change the way they are working if needed?
- How well do they test and evaluate their final product?
- Is it fit for purpose?
- What would improve it?
- Would different resources have improved their product?
- Would they need more or different information to make it even better?
- Can they justify why they selected specific materials?
- Can they work within a budget?
- How have they ensured that their work is precise and accurate?
- Can they hide joints so as to improve the look of their product?

# Year 6 Statutory Requirements

Working Scientifically (Y5 & Y6)	Living things and their habitats	Animals, including humans
<ul style="list-style-type: none"> <li>planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> <li>identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>give reasons for classifying plants and animals based on specific characteristics.</li> </ul>	<ul style="list-style-type: none"> <li>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>

# Year 6 Statutory Requirements (continued)

Evolution and inheritance	Light	Electricity
<ul style="list-style-type: none"><li>• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li><li>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li><li>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li></ul>	<ul style="list-style-type: none"><li>• recognise that light appears to travel in straight lines</li><li>• 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</li><li>• 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</li><li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li></ul>	<ul style="list-style-type: none"><li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li><li>• 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</li><li>• use recognised symbols when representing a simple circuit in a diagram.</li></ul>

# Science: Year 6 Overview

	LIVING THINGS and their Habitats	ANIMALS, including Humans	EVOLUTION and INHERITANCE	LIGHT	ELECTRICITY
<b>YEAR 6</b>	<ul style="list-style-type: none"> <li>• Classification of living things</li> <li>• Vertebrates and invertebrates</li> <li>• Classifying reptiles, amphibians, mammals, insects, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Circulatory system</li> <li>• Heart, blood vessels</li> <li>• Diet, exercise and drugs</li> <li>• Transport of nutrients through the body</li> </ul>	<ul style="list-style-type: none"> <li>• Fossils tell us about the past</li> <li>• Off spring</li> <li>• Changes to the human skeleton over time</li> <li>• Darwin</li> </ul>	<ul style="list-style-type: none"> <li>• How light travels</li> <li>• The eye</li> <li>• Shadows</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical circuits (series)</li> <li>• Designing traffic lights</li> </ul>
<b>Possible Learning Challenge</b>	<ul style="list-style-type: none"> <li>• <b>Could Spiderman really exist?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>What would a journey through your body be like?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Have we always looked like this?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>How can you light up your life?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Could you be the next Nintendo apprentice?</b></li> </ul>

# Knowledge, Skills and Understanding breakdown for Working Scientifically

## Year 6

Planning	Obtaining and presenting evidence	Considering evidence and evaluating
<ul style="list-style-type: none"> <li>• Can they explore different ways to test an idea, choose the best way, and give reasons?</li> <li>• Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?</li> <li>• Can they plan and carry out an investigation by controlling variables fairly and accurately?</li> <li>• Can they make a prediction with reasons?</li> <li>• Can they use information to help make a prediction?</li> <li>• Can they use test results to make further predictions and set up further comparative tests?</li> <li>• Can they explain, in simple terms, a scientific idea and what evidence supports it?</li> <li>• Can they present a report of their findings through writing, display and presentation?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they explain why they have chosen specific equipment? (incl ICT based equipment)</li> <li>• Can they decide which units of measurement they need to use?</li> <li>• Can they explain why a measurement needs to be repeated?</li> <li>• Can they record their measurements in different ways? (incl bar charts, tables and line graphs)</li> <li>• Can they take measurements using a range of scientific equipment with increasing accuracy and precision?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they find a pattern from their data and explain what it shows?</li> <li>• Can they use a graph to answer scientific questions?</li> <li>• Can they link what they have found out to other science?</li> <li>• Can they suggest how to improve their work and say why they think this?</li> <li>• Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?</li> <li>• Can they report findings from investigations through written explanations and conclusions?</li> <li>• Can they identify scientific evidence that has been used to support to refute ideas or arguments?</li> <li>• Can they report and present 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?</li> </ul>

## Year 6 (Challenging)

<ul style="list-style-type: none"> <li>• Can they choose the best way to answer a question?</li> <li>• Can they use information from different sources to answer a question and plan an investigation?</li> <li>• Can they make a prediction which links with other scientific knowledge?</li> <li>• Can they identify the key factors when planning a fair test?</li> <li>• Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they plan in advance which equipment they will need and use it well?</li> <li>• Can they make precise measurements?</li> <li>• Can they collect information in different ways?</li> <li>• Can they record their measurements and observations systematically?</li> <li>• Can they explain qualitative and quantitative data?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they draw conclusions from their work?</li> <li>• Can they link their conclusions to other scientific knowledge?</li> <li>• Can they explain how they could improve their way of working?</li> </ul>
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# Knowledge, Skills and Understanding breakdown for Living Things, their Habitats and Animals, including humans

## Year 6

Evolution and Inheritance	Living Things & their habitats	Animals, including humans
<ul style="list-style-type: none"> <li>• Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago?</li> <li>• Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents?</li> <li>• Can they give reasons why offspring are not identical to each other or to their parents?</li> <li>• Can they explain the process of evolution and describe the evidence for this?</li> <li>• Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they 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?</li> <li>• Can they give reasons for classifying plants and animals based on specific characteristics?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood?</li> <li>• Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function?</li> <li>• Can they describe the ways in which nutrients and water are transported within animals, including humans?</li> </ul>

## Year 6 (Challenging)

<ul style="list-style-type: none"> <li>• Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace?</li> <li>• Can they explain how some living things adapt to survive in extreme conditions?</li> <li>• Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?</li> <li>• Can they begin to understand what is meant by DNA?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they explain why classification is important?</li> <li>• Can they readily group animals into reptiles, fish, amphibians, birds and mammals?</li> <li>• Can they sub divide their original groupings and explain their divisions?</li> <li>• Can they group animals into vertebrates and invertebrates?</li> <li>• Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?</li> </ul>	<ul style="list-style-type: none"> <li>• Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies?</li> <li>• Can they compare the organ systems of humans to other animals?</li> <li>• Can they make a diagram of the human body and explain how different parts work and depend on one another?</li> <li>• Can they name the major organs in the human body?</li> <li>• Can they locate the major human organs?</li> <li>• Can they make a diagram that outlines the main parts of a body?</li> </ul>
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# Knowledge, Skills and Understanding breakdown for Light and Electricity

## Year 6

### Electricity

- Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers)
- Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches?
- Can they use recognised symbols when representing a simple circuit in a diagram?

### Light

- Can they recognise that light appears to travel in straight lines?
- Can they 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?
- Can they 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?
- Can they use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them?

## Year 6 (Challenging)

- Can they make their own traffic light system or something similar?
  - Can they explain the danger of short circuits?
  - Can they explain what a fuse is?
  - Can they explain how to make changes in a circuit?
  - Can they explain the impact of changes in a circuit?
  - Can they explain the effect of changing the voltage of a battery?
- Can they explain how different colours of light can be created?
  - Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope)
  - Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.

# Year 6: Could Spiderman really exist?

## Year 6: Science and DT Knowledge, Skills and Understanding

### Year 6 Science: Living Things and their Habitats

- Can they describe and compare the life cycles of a range of animals, including humans, amphibians, insects and birds?
- Can they talk with knowledge about birth, reproduction and death of familiar animals or plants?
- Can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, labels, scattergraphs, tables, bar and line graphs?

### Year 6 Challenging

- Can they observe their local environment and draw conclusions about life-cycles? (for example, the vegetable garden or flower border)
- Can they classify plants and animals in their local environment with those around the world, e.g. rainforests?
- Can they find a pattern from their data and explain what it shows?
- Can they link what they have found out to other science?
- Can they suggest how to improve their work and say why they think this?

### Art & Design

- Do their sketches communicate emotions and a sense of self with accuracy and imagination?
- Can they explain why they have combined different tools to create their drawings?
- Can they explain why they have chosen specific drawing techniques?
- Can they explain what their own style is?
- Can they use a wide range of techniques in their work?
- Can they explain why they have chosen specific painting techniques?
- Do their sketch books contain detailed notes, and quotes explaining about items?
- Do they compare their methods to those of others and keep notes in their sketch books?
- Do they combine graphics and text based research of commercial design, for example magazines etc., to influence the layout of their sketch books.
- Do they adapt and refine their work to reflect its meaning and purpose, keeping notes and annotations in their sketch books?

# Year 6: What would a journey through your body look like?

## Year 6: Science and Art Knowledge, Skills and Understanding

### Year 6 Science: Animals, including humans

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- Can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs?
- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
  
- Can they identify and explain the function of the organs of the human circulatory system? (heart, blood vessels, blood)
- Can they name the major organs in the human body?
- Can they locate the major human organs?
- Can they make a diagram that outlines the main parts of a body?

### Year 6 Challenging

- Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies?
- Can they compare the organ systems of humans to other animals?
- Can they make a diagram of the human body and explain how different parts work and depend on one another?

### Art & Design

- Can they use paper mosaic to produce a piece of art?
- Can they combine visual and tactile qualities?
- Do they successfully use shading to create mood and feeling?
- Can they organise line, tone, shape and colour to represent figures and forms in movement?
- Can they explain why they have chosen specific materials to draw with?
- Do they keep notes in their sketch books as to how they might develop their work further?
- Do they use their sketch books to compare and discuss ideas with others?

## Year 6: Have we always looked like this?

### Year 6: Science, Art and Dance Knowledge, Skills and Understanding

#### Year 6 Science: Evolution and Inheritance

- Can they give reasons for why living things produce offspring of the same kind?
- Can they give reasons for why offspring are not identical with each other or with their parents?
- Can they explain the process of evolution and describe the evidence for this?
- Can they begin to appreciate that variation in offspring over time can make animals more or less able to survive in particular environments?
- Can they talk about the life of Charles Darwin?

#### Dance

- Can they work creatively and imaginatively on their own, with a partner to compose motifs and structure simple dances?
- Can they perform to an accompaniment expressively and sensitively?
- Can they perform dances fluently and with control?
- Can they warm-up and cool-down independently?
- Do they understand how dance helps to keep them healthy?
- Do they use appropriate criteria to evaluate and refine their own and others' work?
- Do they talk about dance with understanding, using appropriate language and terminology?

#### Year 6 Challenging

- Can they explain how some living things adapt to survive in extreme conditions?
- Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?
- Can they begin to understand what is meant by DNA?

#### Art & Design

- Do their sketches communicate emotions and a sense of self with accuracy and imagination?
- Can they explain why they have combined different tools to create their drawings?
- Can they explain why they have chosen specific drawing techniques?
- Do their sketch books contain detailed notes, and quotes explaining about items?
- Do they compare their methods to those of others and keep notes in their sketch books?
- Do they combine graphics and text based research of commercial design, for example magazines etc., to influence the layout of their sketch books.
- Do they adapt and refine their work to reflect its meaning and purpose, keeping notes and annotations in their sketch books?

# Year 6: How can you light up your life?

## Year 6: Science and Art Knowledge, Skills and Understanding

### Year 6 Science: Light

- Can they explore different ways to test an idea and choose the best way, and give reasons?
- Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this?
- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use information to help make a prediction?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they explain (in simple terms) a scientific idea and what evidence supports it?
- Can they present a report of their findings through writing, display and presentation?
  
- Can they explain how light travels?
- Can they explain how the human eye sees objects?
- Can they explain how different colours of light can be created?
- Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope)
- Can they explain changes linked to light (and sound)?

### Year 6 Challenging

- Can they make a prediction which links with other scientific knowledge?
- Can they identify the key factors when planning a fair test?
- Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough?
  
- Can they use the ray model to explain the size of shadows?

### Art & Design

- Do their sketches communicate emotions and a sense of self with accuracy and imagination?
- Can they explain why they have combined different tools to create their drawings?
- Can they explain why they have chosen specific drawing techniques?
- Can they explain what their own style is?
- Can they use a wide range of techniques in their work?
- Can they explain why they have chosen specific painting techniques?
- Do their sketch books contain detailed notes, and quotes explaining about items?
- Do they compare their methods to those of others and keep notes in their sketch books?
- Do they combine graphics and text based research of commercial design, for example magazines etc., to influence the layout of their sketch books.
- Do they adapt and refine their work to reflect its meaning and purpose, keeping notes and annotations in their sketch books?
- Can they make a record about the styles and qualities in their work?
- Can they say what their work is influenced by?

## Year 6: Could you be the next Nintendo apprentice?

### Year 6: Science and DT Knowledge, Skills and Understanding

#### Year 6 Science: Electricity

- Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers, motors)
- Can they compare and give reasons for variation in how components function, including bulb brightness, buzzer volume and on/off position of switches?
- Can they explain how to make changes in a circuit?
- Can they explain the impact of changes in a circuit?
- Can they explain the effect of changing the voltage of a battery?

#### Year 6 Challenging

- Can they make their own traffic light system or something similar?
- Can they explain the danger of short circuits?
- Can they explain what a fuse is?

#### Design Technology

- Can they use a range of information to inform their design?
- Can they use market research to inform plans?
- Can they work within constraints?
- Can they follow and refine their plan if necessary?
- Can they justify their plan to someone else?
- Do they consider culture and society in their designs?
- Can they use tools and materials precisely?
- Do they change the way they are working if needed?
- How well do they test and evaluate their final product?
- Is it fit for purpose?
- What would improve it?
- Would different resources have improved their product?
- Would they need more or different information to make it even better?