Science: Endpoints of Learning

EYFS and KS1 Sequences of Work

<table>
<tr><th colspan="3">Plants (1)</th></tr>
<tr><td colspan="3">

- Identify and describe the basic structure of flowering plants.
- Identify, name and observe a variety of common plants (garden/wild plants, vegetables, trees) growing in their habitat.
- Identify deciduous and evergreen trees.

</td></tr>
<tr><th colspan="3">Working Scientifically: Explaining Science and Classification</th></tr>
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<td>

Reception

- I use science words during an activity
- I describe what is happening using words and actions
- I match appropriate picture and words to label diagrams
- I sort using pictures or instructions
- I group by familiar features

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Year 1

- I use and remember science words during an activity
- I describe what is happening using science
- I add science word labels to diagrams
- I sort using simple yes/no statements
- I group by difference or similarity

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Year 2

- I use and remember science words over a short time
- I use science to describe and recall what I have seen
- I add science labels and information to diagrams (with support)
- I use simple spider keys with obvious differences
- I group by difference similarity or change

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Animals, including humans (1)

- Identify, name, describe features of and compare common vertebrates.
- Identify and name common carnivores, herbivores and omnivores.
- Identify, name, draw and label basic human body parts.
- Know the five senses and link these to human body parts.

Working Scientifically: Explaining Science and Making Conclusions

Reception	Year 1	Year 2
- I use science words during an activity - I remember simple science facts within an activity - I match appropriate pictures and words to label diagrams - I sort using pictures or instructions - I group by familiar features	- I use and remember science words during an activity - I remember simple science facts within a topic - I add science word labels to diagrams - I sort using simple yes/no statements - I group by difference or similarity	- I use and remember science words over time - I remember a range of science facts within a topic - I add science word labels and information to diagrams, with support - I use simple spider keys with obvious differences - I group by difference similarity or change

Everyday materials (1)

- Distinguish between an object and the material from which it is made
- Describe the materials that a range of objects are made from, including wood, plastic, glass, metal, water, and rock.
- Describe simple physical properties of a variety of everyday materials.
- Compare and group a variety of everyday materials using their physical properties.

Working Scientifically: Explaining Science and Making Conclusions

Reception	Year 1	Year 2
- I use science words during an activity - I remember simple science facts within an activity - I match appropriate pictures and words to label diagrams - I group by familiar features - I use my senses to identify properties of materials	- I use and remember science words during an activity - I remember simple science facts within a topic - I add science word labels to diagrams - I group by difference or similarity - I link properties of materials to an application, with support	- I use and remember science words over a short time - I remember a range of science facts within a topic - I add science labels & information to diagrams, with support - I group by difference, similarity or change - I link properties of materials to an application

Seasonal changes

- Observe and describe changes across the four seasons.
- Observe, describe, measure and record weather across the four seasons.
- Observe the sun moving across the sky. Describe changes in day length across the seasons

Working Scientifically: Explaining Science and Data, Tables and Graphs

Reception	Year 1	Year 2
- I use science words during an activity - I remember simple science facts within an activity - I describe what is happening using words and actions - I use a simple table recording in pictures and words - I add to pictograms with help - I represent groups using resources, marks and numbers	- I use and remember science words during an activity - I remember simple science facts within a topic - I describe what is happening using science - I use a simple table recording in words and numbers - I use a frame to add to pictograms and block charts - I add to block charts by counting up	- I use and remember science words over a short time - I remember a range of science facts within a topic - I use science to describe and recall what I have seen - I use a simple table recording in words and numbers (including tally) - I construct simple pictograms and block charts - I use scale on a block chart (coordinate) to add correct blocks

Forces

- Recognise and name a push and a pull force in action.
- Know that a force is needed to move an object.
- Explore and investigate that a bigger force is needed to move an object further.

Working Scientifically: Explaining Science and Designing Experiments

Reception	Year 1	Year 2
- I use science words during an activity - I describe what is happening using words and actions - I match appropriate pictures and words to label diagrams - I use experience to suggest what might happen next - I'm aware that variables change in an investigation - I follow demo and spoken instructions in order	- I use and remember relevant science words during activity - I describe what is happening using science, with support - I add science word labels to diagrams - I suggest what might happen in an investigation - I begin to describe the cause variable in an investigation - I follow demo, spoken and picture instructions in order	- I remember science words over a short time - I use science to describe and recall what I have seen - I add science labels and information to diagrams, with support - I suggest what might happen (simple prediction) - I identify the cause variable correctly - I follow spoken and written instructions in order

Light

- Know a range of light sources (natural and man-made), including the Sun as a light source.
- Know that the light coming from a light source can be brighter or dimmer.
- Know that light reflects off some materials and goes through others.
- Know that opaque materials block light and so form a shadow behind them.
- Know how to stay safe in the sun and the dark.

Working Scientifically: Explaining Science and Data, Tables and Graphs

<u>Reception</u>

- I use science words during an activity
- I describe what is happening using words and actions
- I match appropriate pictures and words to label diagrams
- I measure numbers on a number track (non-standard)
- I use a simple table recording in pictures and words
- I represent groups using resources, marks and numbers

<u>Year 1</u>

- I use and remember science words during an activity
- I describe what is happening using science
- I add science word labels to diagrams
- I measure numbers on a number track
- I use a simple table recording in words and numbers
- I add to block charts by counting up

<u>Year 2</u>

- I use and remember science words over a short time
- I use science to describe and recall what I have seen
- I add science labels and information to diagrams, with support
- I measure labelled standard units on a number line
- I use a simple table recording in words and numbers (including tally)
- I use scale on a block chart (coordinate) to add correct blocks

Living things and their habitats

- Explore and compare the differences between things that are living, dead, and things that have never been alive
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- Identify and name a variety of plants and animals in their habitats, including microhabitats
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Working Scientifically: Explaining Science and Classification

Reception	Year 1	Year 2
- I use science words during an activity - I describe what is happening using words and actions - I match appropriate pictures and words to label diagrams - I sort using pictures or instructions - I group by familiar features (size, colour, shape, etc)	- I use and remember science words during an activity - I describe what is happening using science - I add science word labels to diagrams - I sort using simple yes/no statements - I group by difference or similarity	- I use and remember science words over a short time - I use science to describe what I have seen - I add science labels and information to diagrams, with support - I use spider keys with obvious differences - I group by difference similarity or change

Plants (2)

- Observe and describe how seeds and bulbs grow into mature plants
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Working Scientifically: Designing Experiments and Making Conclusions

Reception	Year 1	Year 2
- I use experience to suggest what might happen next - I am aware that variables change in an investigation - I follow demonstrations, spoken and picture instructions - I recognise, create and describe simple patterns (e.g. size) - I talk about changes through my senses during activities - I explore 'what if …' questions through talk and play	- I suggest what might happen in an investigation - I begin to identify the cause variable in an investigation - I follow demo, spoken and picture instructions - I recognise, create and describe number patterns - I describe the changes that are happening - I explore different ways to do things through play	- I suggest what might happen (simple prediction) - I identify the cause variable correctly in an investigation - I follow short spoken and written instructions in order - I describe features and patterns in data and charts - I describe the changes that have happened - I suggest a different way to do things with support

Animals, including humans (2)

- Notice that animals, including humans, have offspring which grow into adults
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Working Scientifically: Explaining Science and Data, Tables and Graphs

Reception	Year 1	Year 2
- I use science words during an activity - I describe what is happening using words and actions - I match appropriate pictures and words to label diagrams - I position numbers on a number track - I use a simple table by recording in pictures and words - I add to pictograms with help	- I use and remember science words during an activity - I use science to describe what is happening - I add science word labels to diagrams - I measure numbers with a number track - I use a simple table recording in words and numbers - I use a frame to add to pictograms and block charts	- I use and remember science words over a short time - I use science to describe and recall what I have seen - I add science labels and information to diagrams, with support - I measure labelled divisions on a number line - I use a simple table recording in words and numbers (including tally) - I construct pictograms and block charts

Uses of everyday materials (2)

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Working Scientifically: Classification and Designing Experiments

Reception	Year 1	Year 2
- I group by familiar features (size, colour, shape, etc) - I use my senses to identify properties of materials - I use a range of everyday items to investigate - I'm aware that variables change in an investigation - I follow short demo, spoken and picture instructions	- I group by difference or similarity - I link properties of materials to an application, with support - I use some equipment correctly - I begin to identify the cause variable in an investigation - I follow short demo, spoken and picture instructions	- I group by difference similarity or change - I link properties of materials to an application - I use a range of equipment correctly - I identify the cause variable correctly I follow short spoken and written instructions in order

Electricity

- Know a range of appliances that need electricity to work.
- Name components and can build closed circuits from circuit diagrams.
- Know the dangers of electricity and can work safely.

Working Scientifically: Explaining Science and Designing Experiments

Reception	Year 1	Year 2
- I use science words during an activity - I describe what is happening using words and actions - I match appropriate pictures and words to label diagrams - I use a range of everyday items to investigate - I begin to know what it means to investigate safely - I follow short demo, spoken and picture instructions	- I use and remember science words during an activity - I use science to describe what is happening - I add science word labels to diagrams - I use some science equipment correctly - I notice risk with help and can list some common dangers - I follow short demo, spoken and picture instructions	- I use and remember science words over a short time - I use science to describe and recall what I have seen - I add science labels and information to diagrams, with support - I use a range of science equipment correctly - I notice risk in my investigation and know common dangers I follow short spoken and written instructions in order

Year 3 / 4 Sequences of Work

<table>
<tr><th colspan="2">Plants</th></tr>
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- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- 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
- Investigate the way in which water is transported within plants
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

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<tr><th colspan="2">Working Scientifically: Explaining Science and Designing Experiments</th></tr>
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<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I predict cause and effect (science prediction)
- I identify cause and effect in an investigation
- I suggest a suitable data range for the cause variable

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<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I predict a trend (relationship prediction)
- I plan investigations by selecting variables to change
- I suggest a data range and interval for the cause variable

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</table>

Animals, including humans (3)

- 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
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement

Working Scientifically: Explaining Science and Data, Tables and Graphs

<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I measure unlabelled divisions on a number line
- I use a frame to construct a simple table of results
- I use a frame to construct a bar chart

<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I measure unmarked divisions on a number line
- I construct a simple table to compare cause and effect
- I construct a bar chart correctly

Rocks

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock
- Recognise that soils are made from rocks and organic matter

Working Scientifically: Explaining Science and Classification

<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I use a large spider key with obvious differences
- I create groups for sorting (create criteria)
- I combine properties required for an application

<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I use a range of spider keys with fine differences
- I create appropriate groups for sorting (create criteria)
- I describe combined properties required for an application

Light

- Recognise that they need light in order to see things and that dark is the absence of light
- Notice that light is reflected from surfaces
- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- Recognise that shadows are formed when the light from a light source is blocked by an opaque object
- Find patterns in the way that the size of shadows changes

Working Scientifically: Explaining Science and Designing Experiments

<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I predict cause and effect (science prediction)
- I identify cause and effect in an investigation
- I suggest a suitable data range for the cause variable

<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I predict a trend (relationship prediction)
- I plan investigations by selecting variables to change
- I suggest a data range and interval for the cause variable

Forces and Magnets

- Compare how things move on different surfaces
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance
- Observe how magnets attract or repel each other and attract some materials and not others
- 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
- Describe magnets as having two poles
- Predict whether two magnets will attract or repel each other, depending on which poles are facing

Working Scientifically: Explaining Science and Designing Experiments

<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I predict cause and effect (science prediction)
- I identify cause and effect in an investigation
- I suggest a suitable data range for the cause variable

<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I predict a trend (relationship prediction)
- I plan investigations by selecting variables to change
- I suggest a data range and interval for the cause variable

Living things and their habitats

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things

Working Scientifically: Classification and Data, Tables and Graphs

Year 3	Year 4
- I use large spider keys with obvious differences - I create groups for sorting (create criteria) - I use a frame to construct a simple table of results - I use a frame to construct a bar chart - I draw bars on a bar chart	- I use a spider key with fine differences - I create appropriate groups for sorting (create criteria) - I construct a simple table to compare cause and effect - I construct a bar chart correctly - I plot coordinates (data points) on a graph

Animals, including humans (4)

- Describe the simple functions of the basic parts of the digestive system in humans
- Identify the different types of teeth in humans and their simple functions
- Construct and interpret a variety of food chains, identifying producers, predators and prey

Working Scientifically: Explaining Science and Making Conclusions

<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I describe simple patterns in charts and graphs
- I describe my results by linking cause and effect
- I suggest improvements to a method

<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I describe simple patterns, trends and relationships
- I describe trends and use science models to explain
- I suggest sensible improvements to a method

<table>
<tr><th colspan="2">States of matter</th></tr>
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- Compare and group materials together, according to whether they are solids, liquids or gases
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

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<tr><th colspan="2">Working Scientifically: Explaining Science and Designing Experiments</th></tr>
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<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I predict cause and effect (science prediction)
- I identify cause and effect in an investigation
- I suggest a suitable data range for the cause variable

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<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I predict a trend (relationship prediction)
- I plan investigations by selecting variables to change
- I suggest a data range and interval for the cause variable

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</table>

Sound

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from sounds travel through a medium to the ear
- Find patterns between the pitch of a sound and features of the object that produced it
- Find patterns between the volume of a sound and the strength of the vibrations that produced it
- Recognise that sounds get fainter as the distance from the sound source increases

Working Scientifically: Explaining Science and Designing Experiments

<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I predict cause and effect (science prediction)
- I identify cause and effect in an investigation
- I suggest a suitable data range for the cause variable

<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I predict a trend (relationship prediction)
- I plan investigations by selecting variables to change
- I suggest a data range and interval for the cause variable

<table>
<tr><th colspan="2">Electricity</th></tr>
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- Identify common appliances that run on electricity
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- 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
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators, and associate metals with being good conductors

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<tr><th colspan="2">Working Scientifically: Explaining Science and Making Conclusions</th></tr>
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<u>Year 3</u>

- I remember science words I have used before
- I begin to use science models to describe
- I add science labels and information to diagrams
- I describe simple patterns in charts and graphs
- I describe my results by linking cause and effect

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<u>Year 4</u>

- I remember and use science words correctly
- I use science models to describe
- I annotate diagrams to help describe and explain
- I describe simple patterns, trends and relationships
- I describe trends and use science models to explain

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Year 5 / 6 Sequences of Work

Living Things and their Habitats (5)

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Describe the life process of reproduction in some plants and animals
- Research life cycles of plants, invertebrates and vertebrates within local habitats. Be able to identify and describe changes over time.

Working Scientifically: Explaining Science and Designing Experiments

<u>Working Scientifically: Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I use knowledge and understanding to explain prediction (relationship)
- I plan investigations and ensure controlled variables kept the same
- I design and write an ordered method (control variables)

<u>Working Scientifically: Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I reason using knowledge and understanding to make hypothesis (relationship)
- I plan a reliable investigation (use variable terminology)
- I design and write an ordered reliable method

Animals, including humans (5)

- Describe the changes as humans develop to old age
- Order and compare the stages in the human life cycle.
- Describe the changes experienced in puberty. Understand why puberty happens. (Covered in PSHE)
- Compare gestation time in animals.

Working Scientifically: Explaining Science and Data, Tables and Graphs

<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I use a frame to construct a complex table of results
- I use a frame to construct a graph and scale axes with help
- I join plotted coordinates with straight lines

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I construct a complex table to show repeated readings
- I construct a graph and scale one axis independently
- I plot mean value coordinates and draw a trend line

Properties and changes of materials

- 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
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Demonstrate that dissolving, mixing and changes of state are reversible changes
- 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

Working Scientifically: Explaining Science and Designing Experiments

<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I use knowledge and understanding to explain predictions (relationship)
- I plan investigations and ensure controlled variables kept same
- I design and write an ordered method (control variables

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own complex 2D/3D diagrams
- I reason using knowledge and understanding to make hypothesis (relationship)
- I plan a reliable investigation (use variable terminology)
- I design and write an ordered reliable method (including repeats)

Earth and space

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Describe the movement of the Moon relative to the Earth
- Describe the Sun, Earth and Moon as approximately spherical bodies
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Working Scientifically: Explaining Science and Making Conclusions

<u>Year 5</u>

- I begin to use complex words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I describe patterns, trends and relationships
- I use data in conclusions and science models to explain

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I describe changing patterns, trends and relationships
- I use primary and secondary data in my conclusions

Forces

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

Working Scientifically: Explaining Science and Data, Tables and Graphs

<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I use a frame to construct a complex table of results
- I use a frame to construct a graph and scale axes, with support
- I join plotted coordinates with straight lines

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I construct a complex table to show repeated data
- I construct a graph and scale at least one axis independently
- I plot mean value coordinates and draw a trend line

Animals, including humans (6)

- Identify and name the main parts of the human circulatory system. Describe the functions of the heart (structure), blood vessels (arteries, veins and capillaries) and blood (components)
- Understand and describe the double circulatory system of humans to describe the way water, nutrients and oxygen are transported in animals
- Recognise the impact of diet, exercise, drugs and lifestyle on the way our bodies function

Working Scientifically: Explaining Science and Designing Experiments

<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I use knowledge and understanding to explain predictions (relationship)
- I plan an investigation and ensure controlled variables are kept the same
- I suggest data range, interval and sufficient readings

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I reason using knowledge and understanding to make hypothesis (relationship)
- I plan a reliable investigation, using variable terminology
- I collect repeated readings (more than 3) and calculate the mean

Evolution and inheritance

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Working Scientifically: Explaining Science and Data, Tables and Graphs

<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I use a frame to construct a complex table of results
- I use a frame to construct a graph and scale axes, with support
- I join plotted coordinates with straight lines

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I construct a complex table to show repeated data
- I construct a graph and scale at least one axis independently
- I plot mean value coordinates and draw a trend line

<table>
<tr><th colspan="2">Light</th></tr>
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- Recognise that light appears to travel in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

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<tr><th colspan="2">Working Scientifically: Explaining Science and Making Conclusions</th></tr>
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<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create and annotate my own 2D/3D diagrams
- I describe patterns, trends and relationships
- I use data in my conclusions and science models to explain
- I identify strengths, weaknesses and improvements

</td><td>

<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I describe changing patterns, trends and relationships
- I use primary and secondary data in my conclusions
- I suggest limitations (data) and practical improvements

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<table>
<tr><th colspan="2">Electricity</th></tr>
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- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- Use recognised symbols when representing a simple circuit in a diagram

</td></tr>
<tr><th colspan="2">Working Scientifically: Explaining Science and Designing Experiments</th></tr>
<tr><td>

<u>Year 5</u>

- I begin to use complex science words correctly
- I use science models to describe and begin to explain
- I begin to create & annotate my own 2D/3D diagrams
- I use knowledge and understanding to explain predictions (relationship)
- I plan investigations and ensure controlled variables are kept the same
- I begin to plan to minimise risk and work safely

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<u>Year 6</u>

- I use complex science words correctly, with growing fluency
- I use science models to describe and explain
- I create and annotate my own 2D/3D diagrams
- I reason using knowledge and understanding to make a hypothesis (relationship)
- I plan reliable investigations using variable terminology
- I plan to minimise risk and describe safe use

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Living Things and their Habitats (6)

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- Give reasons for classifying plants and animals based on specific characteristics
- Know the five kingdoms of living things and the binomial naming system.
- Use and construct classification keys.
- Know how to sample a habitat for species diversity (biodiversity). Measure species richness, abundance & evenness. Measure abiotic factors over time. Manage/plan change to encourage biodiversity.

Working Scientifically: Classification and Designing Experiments

<u>Year 5</u>

- I construct spider keys and use number keys
- I group and sub-group by easy observations
- I use knowledge and understanding to explain my relationship prediction
- I plan investigations and ensure controlled variables are the same
- I begin to plan to minimise risk and work safely

<u>Year 6</u>

- I construct both spider and number keys
- I group and sub-group by fine observations
- I reason using knowledge and understanding to make a hypothesis (relationship)
- I plan reliable investigations using variable terminology
- I plan to minimise risk and describe safe equipment use

Working Scientifically: Reception

Explaining Science

- I remember simple science facts within an activity
- I use science words during an activity
- I describe what is happening using words and actions
- I match appropriate pictures and words to label diagrams
- I begin to use science facts to explain my answer.

Classification

- I sort using pictures or instructions
- I group by familiar features (size, colour, shape, etc)
- I use my senses to identify properties of materials

Designing experiments

- I use experience to suggest what might happen next
- I use a range of everyday items to investigate
- I begin to know what it means to investigate safely
- I use experience to suggest an idea to investigate
- I am aware that variables change in an investigation
- I follow short demo and spoken instruction with multiple parts

Data, tables and graphs

- I position numbers on a number track to 10 and beyond
- I use non-standard units to measure and compare
- I use a simple table by recording in pictures and words
- I add to pictograms with support
- I represent groups using resources, marks and numbers
- I compare groups using comparative language

Making conclusions

- I recognise, create and describe simple patterns (e.g. size)
- I begin to use 'more or less' to compare observations
- I talk about changes through my senses during activities
- I explore 'what if ..' questions through talk and play

Working Scientifically Year 1

Explaining Science

- I remember simple science facts within a topic
- I use and remember relevant science words during activity
- I describe what is happening using science
- I add science word labels to diagrams
- I select science facts to use in an answer

Classification

- I sort using simple yes/no statement
- I group by difference or similarity
- I link properties of materials to an application, with support

Designing experiments

- I suggest what might happen in an investigation
- I use a limited range of science equipment correctly, with support
- I notice risk (with support) and can list some common dangers
- I suggest an idea to investigate and ask questions
- I begin to identify the cause variable in an investigation
- I follow short demo, spoken and picture instructions

Data, tables and graphs

- I position numbers on a number track to 20 and beyond
- I measure in non-standard and compare e.g. heavier/lighter
- I use a simple table by recording in words and numbers
- I use a frame to add to pictograms and block charts
- I add to block charts by counting up

Making conclusions

- I recognise, create and describe simple number patterns
- I use 'more or less' to compare numbers
- I describe the changes that are happening
- I explore different ways to do things through play

Working Scientifically Year 2

Explaining Science

- I remember a range of science facts within a topic
- I use and remember science words over time (short term)
- I use science to describe and recall what I have seen
- I add science labels and information to diagrams, with support
- I select relevant science facts to use in an answer

Classification

- I use simple spider keys with obvious differences
- I group by difference, similarity or change
- I link properties of materials to an application

Designing experiments

- I suggest what might happen (simple prediction)
- I use a range of science equipment correctly
- I notice risk in my investigation and know common dangers
- I suggest an idea to investigate from observations
- I identify the cause variable correctly (label and range)
- I follow short spoken and written instructions in order

Data, tables and graphs

- I measure labelled divisions on a number line (including in steps)
- I measure standard units (including length, mass, capacity)
- I use a simple table recording in words and numbers (including tally)
- I construct simple pictograms and block charts
- I use scale on block chart (coordinate) to add correct blocks

Making conclusions

- I describe simple features and patterns in data and charts
- I see obvious differences in sets of numbers
- I describe the changes that have happened
- I suggest a different way to do things with help

Working scientifically Year 3

Explaining Science

- I am using pre-learning to build connected knowledge
- I remember science words I have used before (longer term)
- I begin to use science models to describe (sequence)
- I add science labels and information to diagrams
- I link relevant facts together in an answer

Classification

- I use large spider keys with obvious differences
- I create groups for sorting (create criteria)
- I combine properties required for an application, with support

Designing experiments

- I predict cause and effect (science prediction)
- I select suitable equipment for the task
- I predict obvious risk and act on safety suggestions
- I identify cause and effect in my investigation
- I suggest a suitable data range for a cause variable
- I follow written instructions and write a simple method

Data, tables and graphs

- I measure unlabelled divisions on a number line (positive values)
- I measure/compare values in standard units
- I use a frame to construct a simple table of results
- I use a frame to construct a bar chart, with support
- I draw bars on a bar chart (one axis coordinate)

Making conclusions

- I describe simple patterns in data, charts and graphs
- I see subtle differences in sets of numbers
- I describe my results by linking cause and effect
- I suggest improvements to my method

Working scientifically Year 4

Explaining Science

- I connect knowledge within a topic and from pre-learning
- I remember and use science words correctly (apply)
- I use science models to describe (what, where)
- I annotate diagrams to help describe and explain
- I 'cluster' related facts together into points (recalled)

Classification

- I use a range of spider keys with fine differences
- I create appropriate groups for sorting (create criteria)
- I describe combined properties required for an application

Designing experiments

- I predict a trend (relationship prediction)
- I select and use suitable equipment for the task
- I predict obvious risk & work safely, with a little support
- I plan investigations by selecting variables to change
- I suggest a data range and interval for a cause variable
- I design and write a simple ordered method (from plan)

Data, tables and graphs

- I measure unmarked divisions on a number line (positive values)
- I measure/convert values in standard units (including time)
- I construct a simple table to compare cause and effect
- I construct bar charts correctly (including numerical axis)
- I plot coordinates on a graph in the first quadrant

Making conclusions

- I describe simple patterns, trends and relationships in data
- I see differences (error) in repeated data
- I describe trends and begin to use science models to explain
- I suggest sensible improvements to my method

Working scientifically Year 5

Explaining Science

- I connect knowledge between topics and from pre-learning
- I begin to use complex science words correctly
- I use science models to describe and begin to explain (why, how)
- I begin to create and annotate my own 2D/3D diagrams
- I select and prioritise facts to create an argument/answer

Classification

- I construct spider and use number keys
- I group and sub-group by easily observation (create criteria)
- I explain how properties suit an application

Designing experiments

- I use knowledge and understanding to explain the relationship between variables
- I select equipment with the right scale for the task (with help)
- I begin to plan to minimise risk & work safely (consistently)

- I plan investigations & ensure controlled variables kept same
- I suggest a data range, interval & sufficient readings
- I design & write an ordered method (controls variables)

Data, tables and graphs

- I measure divisions on a number line past zero (positive values)
- I measure/convert values in standard units (including area)
- I use a frame to construct a complex table of results
- I use a frame to construct a graph and can scale axes with support
- I join plotted coordinates with straight lines

Making conclusions

- I describe patterns, trends and relationships in data
- I spot anomalous data that doesn't fit the pattern
- I use data in my conclusion and science models to explain
- I identify strengths and weaknesses and can make improvements

Working Scientifically Year 6

Explaining Science

- I connect knowledge across science and the wider curriculum
- I use complex science words correctly, with fluency
- I use science models to describe and explain (why, how, logical)
- I create and annotate my own 2D/3D diagrams
- I present a clear and logical argument / answer

Classification

- I construct both spider and number keys
- I group and sub-group by fine observation (create criteria)
- I explain the science behind a range of properties

Designing experiments

- I reason using knowledge and understanding to make a hypothesis about the relationship between variables
- I select and use equipment with right scale for the task
- I plan to minimise risk and describe safe use of equipment
- I plan reliable investigations (use of variable terminology)
- I plan to collect repeat readings (G3) & calculate mean
- I design and write an ordered reliable method, including using repeats

Data, tables and graphs

- I scale up/down a number line (axis) & decide on limits
- I measure/calculate with standard units (including area and volume)
- I construct a complex table to show repeated data

- I construct graphs and can scale at least one axis independently
- I plot mean values and draw a trend line for linear data

Making conclusions

- I describe changing patterns, trends and relationships
- I spot anomalous data and explain from the method
- I use primary and secondary data in my conclusions
- I suggest limitations (data) and practical improvements