Wath C of E Primary School; Progression in working scientifically

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	To use the following practical scientific methods, processes and skills (adult support may be needed)	To use the following practical scientific methods, processes and skills **with increasing confidence**	To use the following practical scientific methods, processes and skills –	To use the following practical scientific methods, processes and skills –	To use the following practical scientific methods, processes and skills –	To use the following practical scientific methods, processes and skills –
Knowledge: **Questioning, enquiring and planning.**	• Ask simple questions.	• Ask simple questions.	• Ask relevant questions.	• Ask relevant questions.	• Ask relevant questions.	• Ask relevant questions.
Skills: **Questioning, enquiring and planning.**	-Can they think of a few simple questions to ask about the world around us? -Can they answer some scientific questions? -Can they give a simple reason for their answers?	-Can they ask simple questions about the world around us? -Can they suggest how to find things out? -Can they use prompts to find things out? -Can they use information from books and online to find things out? -Can they explain why it might not be fair to compare two things?	-Can they ask some relevant questions about the world around us? -Can they use different ideas and suggest how to find something out? -Can they use some different types of scientific enquiry to answer questions? -Can they begin to decide which type of enquiry is best to answer their questions? -Can they make and record a prediction before testing? -Can they plan a fair test and explain why it was fair? (with support)	-Can they ask relevant questions about the world around us? -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 a fair test? -Can they make a prediction with reasons? -Can they use information to help make a prediction?	-Can they begin to explore ideas and ask my own questions about scientific phenomena? -Can they begin to plan different types of scientific enquiry to answer questions? Can they begin to decide which variables to control.	-Can they explore ideas and ask their own questions about scientific phenomena? Can they plan different types of scientific enquiry to answer questions? Can they decide which variables to control?

Knowledge: **Observing, measuring and pattern seeking.**	• Observe closely, using simple equipment.	• Observe closely, using simple equipment.	• Observe closely, using simple equipment.	• Observe closely, using simple equipment.	• Observe closely, using simple equipment.	• Observe closely, using simple equipment.
Skills: **Observing, measuring and pattern seeking.**	-I can talk about what I can see. -I can use simple equipment with adult support. -I can measure using non-standard units. -I can notice some patterns (with support).	-I can observe changes over time. -I can say what I am looking for and what I am measuring. -I can measure with nonstandard units and can begin to use simple standard units eg, mm, cm, m, ml, l , ºC -I can use simple equipment eg hand lenses, egg timers. -I am beginning to notice patterns.	-I can make systematic and careful observations. -Begin to make own decision about what to observe and how long to collect observations. -I can take accurate measurements using standard units eg. mm, cm, m, ml, l, ºC, seconds, minutes. -Begin to learn how to use new equipment eg. data loggers (some support). -Begin to look for naturally occurring patterns and relationships (some support).	-I can make systematic and careful observations. -I can decide what to observe and how long to collect observations. -I can take accurate measurements using standard units eg. mm, cm, m, ml, l, ºC, seconds, minutes. -I can decide which equipment to use and can use new equipment eg. data loggers. -I can look for patterns and relationships.	-I can begin to take measurements with increasing precision and accuracy. -I can begin to identify patterns that might be found in the natural environment. -I can begin to interpret data. -I can decide what to observe, how long to observe for and whether to repeat them. -I can begin to make a set of observations and say what the interval and range are. -I can begin to take accurate and precise measurements using standard units N, g, kg, mm, cm, mins, seconds, cm^2V, km/h, m per sec, m/ sec. -I can select equipment on my own and can explain how to use it accurately.	-I can make accurate and precise measurements, taking repeat readings where accurate and appropriate. -I can interpret data and identify patterns that might be found in the natural environment. -I can decide what to observe, how long to observe for and whether to repeat them. -I can make a set of observations and say what the interval and range are. -I can take accurate and precise measurements using standard units N, g, kg, mm, cm, mins, seconds, cm^2V, km/h, m per sec, m/ sec. -I can select equipment on my own and can explain how to use it accurately.

Knowledge: **Investigating**	• Perform simple tests.	• Perform simple tests.	• Set up simple, practical enquiries and comparative and fair tests.	• Set up simple, practical enquiries and comparative and fair tests.	• Set up simple, practical enquiries and comparative and fair tests.	• Set up simple, practical enquiries and comparative and fair tests.
Skills: **Investigating**	-I can test ideas suggested to me. -I can say what I think will happen. -I can use first hand experiences to answer questions begin to compare some living things.	-I can use simple equipment provided to aid observation. -I can compare objects, living things or events. -I can make observations relevant to my task. -I can begin to recognise when a test or comparison is unfair. -I can use first hand experiences to answer questions.	-I can put forward own ideas about how to find the answers to questions. -I can recognise the need to collect data to answer questions. -I can carry out a fair test with support. -I can recognise and explain why it is a fair test with help. - Pupils begin to realise that scientific ideas are based on evidence.	-With help, pupils begin to realise that scientific ideas are based on evidence. -Pupils can show in the way they perform their tasks how to vary one factor while keeping others the same. -I can decide on an appropriate approach in my own investigations to answer questions. -Pupils can describe which factors they are varying and which will remain the same and say why.	-Use previous knowledge and experience combined with experimental evidence to provide scientific explanations. -I can recognise the key factors to be considered in carrying out a fair test.	-I can describe evidence for a scientific idea. -I can use scientific knowledge to identify an approach for an investigation explains how the interpretation leads to new ideas.

Knowledge: **Recording and reporting findings.**	• Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	• Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions.	• Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use straightforward, scientific evidence to answer questions or to support their findings.	• Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use straightforward, scientific evidence to answer questions or to support their findings.	• Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use straightforward, scientific evidence to answer questions or to support their findings.	• Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use straightforward, scientific evidence to answer questions or to support their findings.
Skills:	-I can begin to collect simple data. -I can begin to record data in a table my teacher has provided.	I can collect simple data. I can record data in a table my teacher has provided. I can communicate my	I am beginning to collect data in a variety of ways, including labelled diagrams, bar charts and tables. I am beginning to help decide how to record data.	I can collect data in a variety of ways, including labelled diagrams, bar charts and tables. I can help decide how to record data.	I am beginning to record data and results of increasing complexity using – scientific diagrams and labels, classification keys , tables ,bar graphs, line graphs.	I can record data and results of increasing complexity using – scientific diagrams and labels classification keys tables bar graphs line graphs.

Recording and reporting findings.	-I can begin to communicate my findings in a variety of ways.	findings in a variety of ways.	I am beginning to communicate findings using simple scientific language.	I can communicate findings using simple scientific language	I am beginning to choose how best to present data. I am beginning to communicate findings using detailed scientific language.	I can choose how best to present data. I can communicate findings using detailed scientific language.
Knowledge: **Identifying, grouping and classifying.**	• Identify and classify.	• Identify and classify.	• Identify differences, similarities or changes related to simple, scientific ideas and processes.	• Identify differences, similarities or changes related to simple, scientific ideas and processes.	• Identify differences, similarities or changes related to simple, scientific ideas and processes.	• Identify differences, similarities or changes related to simple, scientific ideas and processes.
Skills: **Identifying, grouping and classifying.**	I can begin to identify a variety of objects, materials and living things. I can begin to compare, sort and group a range of objects, materials and living things.	I can identify a variety of objects, materials and living things. I can compare, sort and group a range of objects, materials and living things	I am beginning to talk about and identify differences and similarities in the properties or behaviour of living things, materials and other scientific phenomena. I am beginning to identify simple changes related to simple scientific phenomena. I am beginning to discuss criteria for grouping and sorting and can classify using simple keys.	I can talk about and identify differences and similarities in the properties or behaviour of living things, materials and other scientific phenomena. I can identify simple changes related to simple scientific phenomena. I can discuss criteria for grouping and sorting and can classify using simple keys.	I am beginning to use keys and other information records to classify and describe living things, materials and other scientific phenomena. I am beginning to develop my own keys and other information records to classify and describe. I am beginning to identify changes related to scientific phenomena.	I can use keys and other information records to classify and describe living things, materials and other scientific phenomena. I can develop my own keys and other information records to classify and describe. I can identify changes related to scientific phenomena.
Knowledge: **Research**	To begin to use simple secondary sources to find answers. To begin to find information to help me from books and computers with help.	Use simple secondary sources to find answers. Can find information to help me from books and computers with help.	Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	Begin to recognise which secondary sources will be most useful to research their ideas.	Recognise which secondary sources will be most useful to research their ideas.
Skills: **Research**	I can begin to find information to help me from books, computers and other familiar sources.	I can find information to help me from books, computers and other familiar sources.	**I can begin to decide when research will help in my enquiry.** **I am beginning to carry out**	**I can begin to decide when research will help in my enquiry.** **I can carry out simple**	I am beginning to recognise which secondary source will be most useful to my research.	I can recognise which secondary source will be most useful to my research.

			simple research on my own.	**research on my own.**	I can begin to carry out research independently.	I can carry out research independently.
Knowledge: **Conclusions**	Begin to talk about what they have found out and how they found it out. To begin to say what happened in my investigation. To begin to say whether I was surprised at the results or not. To begin to say what I would change about my investigation.	Talk about what they have found out and how they found it out. To say what happened in my investigation. To say whether I was surprised at the results or not. To say what I would change about my investigation.	I am beginning to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. I am beginning to use straightforward scientific evidence to answer questions or to support my findings. I am beginning to see a pattern in my results. I am beginning to say what I found out, **linking cause and effect.**	Using results to draw simple conclusions , make predictions for new values, suggest improvements and raise further questions. Use straightforward scientific evidence to answer questions or to support their findings. With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, identify new questions arising from the data, make new predictions and find ways of improving what they have already done. Can see a pattern in my results. Can say what I found out, **linking cause and effect.** Can say how I could make it better. Can answer questions from what I have found out.	I am beginning to 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. Begin to identify scientific evidence that has been used to support or refute ideas or arguments. Begin to draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Begin to use test results to make predictions to set up further comparatives and fair tests. Begin to look for different causal relationships in their data and identify evidence that refutes or supports their ideas. Use their results to identify when further tests and observations are needed. Begin to separate opinion from fact.	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. Identify scientific evidence that has been used to support or refute ideas or arguments. Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Use test results to make predictions to set up further comparatives and fair tests. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas. Use their results to identify when further tests and observations are needed. Separate opinion from fact. Can draw conclusions and identify scientific evidence.

					Begin to draw conclusions and identify scientific evidence.	Can use simple **models.** Know which evidence proves a scientific point. Use test results to make predictions to set up further comparative and fair tests.
Skills: **Conclusions**	I can begin to talk about what I have found out. I can begin to explain how I carried out my enquiry. I can begin to suggest simple changes to my enquiry.	I can talk about what I have found out. I can explain how I carried out my enquiry. I can suggest simple changes to my enquiry.	I am beginning to draw simple conclusions based on the results of my enquiry. I am beginning to answer my questions using the results of my enquiry. I am beginning to use my findings to make new predictions, suggest improvements and think of new questions. I am beginning sometimes to think of cause and effect in my explanations.	I can draw simple conclusions based on the results of my enquiry. I can answer my questions using the results of my enquiry. I can use my findings to make new predictions, suggest improvements and think of new questions. I can begin to think of cause and effect in my explanations.	I am beginning to draw scientific, causal conclusions using the results of an enquiry to justify my ideas.. I am beginning to explain my conclusion using scientific knowledge and understanding. I am beginning to distinguish opinion and facts. I am beginning to use my findings to make predictions and set up further enquiries. I can begin to use abstract models to explain my ideas.	I can draw scientific, causal conclusions using the results of an enquiry to justify my ideas. I can explain my conclusion using scientific knowledge and understanding. I can distinguish opinion and facts. I can use my findings to make predictions and set up further enquiries. I can begin to use abstract models to explain my ideas.

Progression in science

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Plants	Plants	Plants	Plants	Plants	Plants
Knowledge	1.Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. 2.Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.	1.Observe and describe how seeds and bulbs grow into mature plants. 2.Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	1. Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. 2. 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. 3. Investigate the way in which water is transported within plants. 4. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Skills (ARE)	1.Given a group of images/ plant names children to classify them into a table wild/ garden. 1. Explain the difference between a deciduous and evergreen tree. 1.Show a picture of a tree with no leaves on-	1.Observations are made of how seeds and bulbs grow into mature plants and, with support, this process can be described. 2.The conditions required for plants to	1. Generally, the functions of different parts of flowering plants are identified and described, e.g. the roots absorb water from the soil to feed the plant, the stem helps to support the plants, the leaves use sunlight to provide the plant with energy and the flower helps the plant to reproduce.			

	children to infer what season it is and explain why/ how they know. 2.The basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers, is identified and described (with no words given).	grow and stay healthy (food, water, air, warmth and light) are identified and described.	2. Generally, the requirements of plants for life and growth, and how these vary from plant to plant are identified and explored. 3. Generally, the way in which water is transported within plants is investigated. 4. The role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal, is explored.			
Skills (GD)	1. Design a garden for home or school-which plants/trees would they use and why? 2. To make a poster/ IT page that the teacher can use to show the parts of a plant/tree and what they are like.	1. Explain why some plants need to grow from a bulb. 1. Apply knowledge in context or in related contexts e.g *Animals need water and the right temperature to survive like plants.* *-Plants make food in their leaves and give out oxygen which we need to breathe* *-Even bulbs start off by growing from seeds.* 2. Explanations are beginning to be offered for changes in living things, e.g. light or water altering plant growth. 2. Apply knowledge in	1. The function of other parts of flowering plants begin to be described, e.g. stamen, style, stigma, anther, filament, ovary, etc. 2. Explain/ prove what factors effect plant growth e.g the amount of light, amount of water… 4. Independently investigate and prove ways to speed up pollination with own flowers.			

		other contexts and create links to other areas of the curriculum *e.g We need to look after plants in our environment because they make oxygen and food that we need. Plants are important because all animals need oxygen and plants are the beginning of every food chain.*				
Biology	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Animals, including humans	Animals, including humans	Animals, including humans	Animals, including humans	Animals, including humans	Animals, including humans
Knowledge	1.Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 2. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. 3.Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 4. Identify, name, draw and label the basic parts of the human body and	1. Notice that animals, including humans, have offspring which grow into adults. 2. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). 3. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	1. 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. 2. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	1. Describe the simple functions of the basic parts of the digestive system in humans. 2. Identify the different types of teeth in humans and their simple functions. 3. Construct and interpret a variety of food chains, identifying producers, predators and prey.	1. Describe the changes as humans develop to old age.	1. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. 2. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. 3. Describe the ways in which nutrients and water are transported within animals, including humans.

	say which part of the body is associated with each sense.					
Skills (ARE)	1. Generally, some common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates are identified and named. 1. Generally, living things can be sorted into groups with justification as to why they have been placed into these groups. 2. A variety of common animals that are carnivores, herbivores and omnivores are identified and named. 3. Generally, the structure of a variety of common animals, e.g. spine, tail, fur, wings, is described. These structures can then be compared. 4. Use a simple diagram of a human body children to circle and label body parts they know.	1. The changes as young animals, including humans growing into adults are described. 2. The basic needs of animals, including humans, for survival are investigated and described. 3. Generally, the importance for humans of exercise, eating the right amounts of different types of food and hygiene is described. 5 key areas: identify and classify Observing over time Not seen: research, pattern seeking, comparative testing	1. Generally, the terms 'nutrition' and a 'balanced diet' are understood. Generally, the fact that animals, including humans, need the right types and amounts of nutrition is identified. 2. Generally, the fact that humans and some animals have skeletons and muscles for support, protection and movement is identified.	1. The simple functions of the parts of the digestive system in humans, e.g. mouth, oesophagus, liver, stomach, small intestine, large intestine and rectum, are described and identified. 2. Generally, the different types of teeth in humans, e.g. molars, incisors and canines, and their simple functions, are identified. Generally, it is recognised that: canines are used for tearing and ripping food, incisors are to help bite off and chew pieces of food and molars are to help crush and grind food. 3. A range of food chains are constructed or interpreted. The terms predator and prey are used correctly.	1. Generally, the changes as humans develop from birth to old age are explained, using appropriate terminology.	1. Generally, the main parts of the human circulatory system are identified and named, and the functions of the heart, blood vessels and blood, including the pulse and clotting, are explained. Scientific names are used for some major organs of body systems and the position of these in the human body can be located. 2. Generally, there is a good understanding on the impact of diet, exercise, drugs and lifestyle on the body's major organs. 3. Generally, there is a good understanding of water absorption, the circulatory system, sweating and urination.
Skills (GD)	1. Common animals are classified as birds, fish, amphibians, reptiles, mammals and invertebrates independently.	1. The changes as young animals, including humans growing into adults are described well using scientific vocabulary *e.g explain*	1. Without support, the terms 'nutrition' and a 'balanced diet' are understood. The reasons why humans need the right types and amounts	1. Explain what can go wrong with the digestive system e.g hiccups/ vomiting. 1. Explain/ justify why being vegetarian is better for the environment.	1. The changes that take place as humans develop from birth to old age are explained in depth with appropriate terminology and examples given. *E.g can chn compare the life*	Apply knowledge in other contexts and create links to other areas of the curriculum *e.g The circulatory system is like an electrical circuit where the heart is a battery.*

	2. Group pictures of a range of animals under the correct headings carnivores, herbivores, omnivores and say what they have in common. 3. The structure of a variety of common animals is described independently. These structures are then compared and reasons for their differences are suggested. 4. Use a simple diagram of a human body children to circle and label the parts of the body associated with each sense.	*how humans resemble their parents.* 2. The basic needs of animals, including humans, for survival are investigated and described independently. 3. Explain/ prove the effects that exercise had on the human body.	of nutrition are articulated. 2. Without support, the fact that humans and some animals have skeletons and muscles for support, protection and movement is identified. It is understood that invertebrates do not have a skeleton.	1. Can chn reflect on the implications of humans being omnivores? What does it mean to be an omnivore? What do humans need to be healthy? 2. Compare the teeth of animals and explain how the shape of an animal's teeth can tell us whether it is a herbivore, omnivore or carnivore. 3. A wide range of food chains are constructed and interpreted. The terms predator and prey are fully understood and used accurately.	*cycles of different animals and humans?* *Can chn use statistical analysis of average age/ height of our school, parents etc to identify patterns, create hypothesise and prove/ disprove a theory?*	*-I have a healthy diet but could eat less fatty food. I need to do more exercise to keep healthy.* There is a fluent and full understanding that diet, exercise, drugs and lifestyle affects many aspects of how the human body functions. Examples are given related to a number of different scenarios *e.g Fatty foods can block up your arteries causing a risk of heart attack. The risk is greater when you exercise or when stressed as the heart is trying to pump blood faster.* *-Your heart is a muscle so exercise will make it stronger.* *-Homemade pizza can be healthy especially if the topping has fresh vegetables but takeaway pizza usually has lots of fat and salt and is not healthy.*

Biology	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	All living things and their habitat	All living things and their habitat	All living things and their habitat	All living things and their habitat	All living things and their habitat	All living things and their habitat
Knowledge		1. Explore and compare the differences between things that are living, dead, and things that have never been alive. 2. 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. 3. Identify and name a variety of plants and animals in their habitats, including microhabitats. 4. 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.		1. Recognise that living things can be grouped in a variety of ways. 2. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. 3. Recognise that environments can change and that this can sometimes pose dangers to living things.	1. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. 2. Describe the life process of reproduction in some plants and animals.	1. 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. 2. Give reasons for classifying plants and animals based on specific characteristics.
Skills (ARE)		1 .Identify and compare the differences between things that are living, that are dead and		1. Reasons are given for classifying plants and animals based on specific characteristics. Animals	1. The life cycles common to a variety of animals, including humans (birth, growth, development,	1. Broad groups are identified and used to classify living things. The terminology of similarities, differences,

		that have never been alive. 2. Identify suitable habitats of animals and plants and how they depend on each other. 3. Plants and animals are identified and named. Animal's habitats are identified and described (including micro-habitats). 4. Simple food chains are described.		are classified as predator and prey. 2. A variety of living things in the local and wider environment are identified and named, using classification keys/ branch diagrams (e.g. taxonomic titles, features, habitats) to assign them to groups. 2. Vertebrate animals are begun to be put into groups, e.g. fish, amphibians, reptiles, birds and mammals; invertebrates into groups, e.g. snails and slugs, worms, spiders and insects; and plants into groups, e.g. flowering plants, including grasses, and nonflowering plants into groups, e.g. ferns and mosses. 3. It is recognised that environments are constantly changing and that this can sometimes pose dangers to specific habitats.	reproduction and death) are described. 2. The life processes of reproduction in some plants and animals are described.	micro-organisms and animals is generally used when describing groups. 2. Suggestions are given as to how to classify plants and animals, with reasons given for the classification.
Skills (GD)		1. Is a flame alive? How do you know? Prove it. 2. Explain and give examples why a pond would be a good habitat for a fish *e.g because it can move/use its senses/find food/respire in a pond.*		1. Plants and animals are not the only living things. There are fungi and bacteria too. Prove it. 2. How are birds similar to reptiles? Research, prove it. *(Birds are similar to reptiles because birds*	1.There is a sound understanding and good knowledge of all basic life processes. Without support, the life cycles common to a variety of animals, including humans (birth, growth, development,	1. Board groups to identify and classify living things are fully understood and used appropriately. 2. Reasons for classifying plants and animals are explained and justified.

		2. Apply concepts- explain how habitats can be affected by humans. 3. Explain where an animal might live and why. 4. Apply concepts- What would happen to a food chain if one kind of animal dies?		*evolved from dinosaurs, which were reptile).* 2. Can chn classify living things in other ways? (*e.g We could classify these living things a different way e.g. land, water, air).* 3. How can habitat loss affect humans? (e.g *Habitat loss can have affect humans because it can damage the air quality or affect our food supply).*	reproduction and death) are described. Can chn compare the life cycles with the most and fewest parts? 2. Independently, the life processes of reproduction in some plants and animals are described. Can chn plan their own investigation and try to grow new plants from different part of a parent plant (e.g seeds, stem, root cuttings?)	
Biology	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Evolution and inheritance	Evolution and inheritance	Evolution and inheritance	Evolution and inheritance	Evolution and inheritance	Evolution and inheritance
Knowledge						1. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. 2. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. 3. Identify how animals and plants are adapted to suit their environment in different ways and that

						adaptation may lead to evolution.
Skills (ARE)						1.There is an understanding that living things have changed over time. Examples are given and fossil evidence used to describe living things that inhabited the Earth millions of years ago. 2. It is recognised that living things produce offspring of the same kind, but that normally offspring vary and are not identical to their parents. 3. Good examples of how different animals and plants are suited to different environments are given. There is an awareness of how adaptation may lead to evolution.
Skills (GD)						2. Apply knowledge- Which type of animal is more likely to have offspring? (*e.g A well-camouflaged animal is less likely to be eaten so more likely to have more offspring).* 3. Demonstrate many examples that explain how different environments suit different animals and

						plants. The theory of evolution is explained in basic terms. 3. Speculate about the adaptations life would need elsewhere in the universe *e.g. on Jupiter.* How could human behaviour have an impact of the survival, extinction or evolution of organisms?
Chemistry	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Everyday Materials	Uses of everyday materials	Rocks	States of Matter	Properties and changes of materials	Everyday Materials
Knowledge	1. Distinguish between an object and the material from which it is made. 2. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. 3. Describe the simple physical properties of a variety of everyday materials. 4. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	1. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. 2. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	1. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. 2. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. 3. Recognise that soils are made from rocks and organic matter.	1. Compare and group materials together, according to whether they are solids, liquids or gases. 2. 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). 3. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	1. 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. 2. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. 3. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	

					4. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. 5. Demonstrate that dissolving, mixing and changes of state are reversible changes. 6. 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.	
Skills (ARE)	1. There is an ability to distinguish between an object and the material from which it is made, with some corrections if needed. 2. A variety of everyday materials are identified and named through observations. 3. The simple physical properties, e.g. strength, flexibility and transparency, of a variety of everyday materials are described. 4. A variety of everyday materials are grouped and compared on the	1. The uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock and paper/cardboard, are identified and compared. 2. There is an ability to find out how the shapes of solid objects made from some materials can be changed.	1. Different kinds of rocks are grouped together and compared on the basis of their simple physical properties, e.g. soft, hard, permeable, impermeable. 2. There is an ability to describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. 3. Soils are generally described accurately as being made of rocks and organic matter.	1. Materials are compared and grouped together according to whether they are solids, liquids or gases. 2. It is observed that some materials change when they are heated or cooled and the temperature at which this happens is measured in degrees Celsius. This builds on the teaching in mathematics. 3. The four main stages of the water cycle are understood and the part	1. Everyday materials are grouped together and compared based on evidence from comparative and fair tests. 2. It is understood how some materials dissolve in liquid to form a solution, and how to recover a substance from a solution can be described. The terms 'soluble' and 'insoluble' are used accurately. 3. Knowledge of solids, liquids and gases is used to decide how mixtures might be separated,	

	basis of their simple physical properties, using appropriate vocabulary.			played by evaporation, condensation and precipitation in the water cycle is identified. Generally, the rate of evaporation is associated with temperature.	including through filtering, sieving and evaporating. Knowledge is used to explain, for example, the water cycle. 4. Reasons are given, based on evidence from tests, for particular uses of everyday materials including metals, wood and plastic. 5. It is demonstrated that dissolving, mixing and changes of state are reversible changes. 6. Knowledge of reversible and nonreversible changes is used to make predictions about whether changes are reversible or not. It is understood 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, oxidisation and the action of acid on bicarbonate of soda.	
Skills (GD)	-Can chn begin to distinguish between natural objects and those that are made *(e.g This twig is natural, this lolly stick has been made).*	-Why can some colours of paint be mixed? *(because they are not waterproof).* -Do chn understand that materials can be	1. Independently, different kinds of rocks are grouped together and compared on the basis of their physical properties. 2. The way in which fossils are formed is described	1. Materials are independently and accurately grouped and compared according to their state of matter. 3. The four main stages of the water cycle are	-Design an everyday item (oven glove, pan stand…based on the properties it would need. -Can chn plan their own investigation or think of other examples of	

	-Can chn begin to explain why it would/ wouldn't be a good idea to make an object out of a certain material (e.g a metal chair would be hard and not comfy). -Apply knowledge- Do chn understand that water is also a material and that materials can be liquid and runny? Can chn investigate this?	solids, liquids, gases and air? -Do chn understand that objects can be made out of more than one material and therefore have multiple properties. Could chn investigate the strength of paper bags? (*e.g Paper bags are made of strong paper. Some have a waterproof coating).* -Why are the tyres of bikes made of rubber? *(because it is flexible).*Why is this property important for a bike?	and explained independently. 3. The composition of soils are described and understood. There is some awareness that different proportions of rock and organic matter give rise to different soil types. Apply key concepts: *-Could chn apply key concepts to create their own rock? (e.g crayon rocks).* *-Could chn plan and carry out their own experiment on how to erode rocks?*	understood independently and this process can be articulated and explained clearly and accurately. Without support, the part played by evaporation and condensation in the water cycle is identified, and the rate of evaporation is associated with temperature. Apply key concepts: *-Can chn plan and carry out their own experiment with varying melting points of foodstuffs e.g (Do healthy foods melt quicker/ slower?)* *-How could we get washing to dry faster?*	irreversible changes? *(E.g vinegar and bicarbonate soda).* Apply knowledge to other contexts: *- Anglo Saxon houses did not have windows because they had not invented glass. Glass can let light in while keeping heat inside.* *-Strong and light materials like carbon fibre can make safe but fuel efficient cars.* *- The lead of a pencil has low conductivity so it can be used as a variable resistor.* *- The water from our taps has been filtered to make it clean.* *- Sugar dissolves quicker in hot tea than cold water.* *-Vinegar reacting with bicarbonate of soda, burning and rusting form new materials.They are chemical reactions.*	

Physics **(separate topics)**	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Seasonal Changes			Sound	Earth and Space	
Knowledge	1.Observe changes across the four seasons. 2. Observe and describe weather associated with the seasons and how day length varies.			1. Identify how sounds are made, associating some of them with something vibrating. 2. Recognise that vibrations from sounds travel through a medium to the ear. 3. Find patterns between the pitch of a sound and features of the object that produced it. 4. Find patterns between the volume of a sound and the strength of the vibrations that produced it. 5. Recognise that sounds get fainter as the distance from the sound source increases.	1. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. 2. Describe the movement of the Moon relative to the Earth. 3. Describe the Sun, Earth and Moon as approximately spherical bodies. 4. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Skills (ARE)	1. Changes across the four seasons are observed and discussed. 2. The weather associated with the seasons and the variation in day length is observed and described.			1. The way in which sounds are made is identified and some of them are associated with something vibrating. 2. The word vibrations is used to describe how sounds travel through various media to the ear.	1. The movement of the Earth relative to the Sun in the solar system is described. 2. The movement of the Moon relative to the Earth is described.	

				3. Patterns are found between the pitch of a sound and features of the object that produced it. 4. Patterns are found between the volume of a sound and the strength of the vibrations that produced it. 5. Generally, the rule 'the greater the distance, the fainter the sound' is used and understood.	3. The Sun, Earth and Moon are described as approximately spherical bodies. 4. The idea of the Earth's rotation is used to explain day and night.	
Skills (GD)	1. The changes across the four seasons are observed and discussed independently, and a clear explanation can be given as to how the four seasons in the UK occur. 2. Without support, the weather associated with the seasons and the variation in day length is observed and described.			Apply knowledge: *-Do chn understand that sound is energy so the more energy you put into making the sound, the louder it can be?* *- Do chn understand that sound travels in solids, liquids and gases because the particles vibrate. It travels fastest in solids because the particles are closer together?* *-Sounds cannot travel in space because there is no air.* *-Why do bats use very high pitched sounds? (to locate their prey)* *- Megaphones, speaking tubes and ear trumpets*	Apply knowledge: -Can chn create working models of key diagrams *(e.g earth orbiting the sun, the moon orbiting the earth).*	

				can amplify sounds but making the vibrations all go in one direction.		
Physics	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Forces and Magnets		Forces	
Knowledge			1. Compare how things move on different surfaces. 2. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. 3. Observe how magnets attract or repel each other and attract some materials and not others. 4. 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. 5. Describe magnets as having two poles. 6. Predict whether two magnets will attract or repel each other, depending on which poles are facing.		1. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. 2. Identify the effects of air resistance, water resistance and friction that act between moving surfaces. 3. Recognise that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect.	
Skills (ARE)			1. The term friction is used to describe how things move on different surfaces.		1. It is explained that unsupported objects fall towards the Earth because of the force of	

			2. It is noticed that some forces need contact between two objects and some forces act at a distance. (E.g. it is observed that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary, e.g. opening a door or pushing a swing.) 3.The way in which magnets attract or repel each other and attract some materials and not others is observed. 4. A variety of everyday materials are compared and grouped together on the basis of whether they are attracted to a magnet. Some magnetic materials are identified. 5. The term poles is generally used to describe magnets. 6. The term poles is used to help explain predictions as to whether magnets will attract or repel each other.		gravity acting between the Earth and the falling object. 2. The effect of drag forces, such as air resistance, water resistance and friction that acts between moving surfaces, is identified. Falling objects begin to be explored and questions are raised about the effects of air resistance. Generally, the effects of air resistance are explored by observing how different objects such as parachutes and sycamore seeds fall. 3. Good explanations of the effects of mechanisms in terms of force and effort are given.	
Skills (GD)			2. Questions begin to be asked about forces that make things begin to move, get faster or slow down. 3. The way in which magnets attract or repel each other is explained.		Apply knowledge in context or in related contexts e.g: *-There is gravity in space; it causes planets to orbit the sun.* *-The more weight we put on the spinner, the*	

			5. The term poles is fully understood and used without prompt to describe magnets. 6. The rule that like poles repel and opposite poles attract is used fluently to explain predictions as to whether magnets will attract or repel each other.		*faster it will fall.* *-Because air resistance depends on speed, it is not important to be an aerodynamic shape when walking.* *-Wheelbarrows and hammers are examples of levers.*	
Physics	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Electricity		Electricity
Knowledge				1. Identify common appliances that run on electricity. 2. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 3. 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. 4. Recognise that a switch opens and closes a circuit and associate this		1. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 2. 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. 3. Use recognised symbols when representing a simple circuit diagram.

				with whether or not a lamp lights in a simple series circuit. 5. Recognise some common conductors and insulators, and associate metals with being good conductors.		
Skills (ARE)				1. All common electrical appliances are named and described as battery, solar or mains powered. 2. The terms cells, wires, bulbs, switches and buzzers are used to describe simple circuits that have been constructed independently. 3. It is identified whether or not a lamp will light in a simple series circuit and this is based on whether or not the lamp is part of a complete loop with a battery. 4. It is recognised that a switch opens and closes a circuit and this is associated with whether or not a lamp lights in a simple series circuit. 5. Some common conductors and insulators are recognised, and metals are associated with being good conductors.		1. The brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit. 2. With reminders, comparisons are made and reasons are given for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. 3. Generally, most recognised symbols are used appropriately.

Skills (GD)				2. Without support, a more complex series electrical circuit is constructed. 4. Without support, it is recognised that a switch opens and closes a circuit and this is associated with whether or not a lamp lights in a simple series circuit. A simple circuit is represented in a diagram using recognised symbols. 5. A wide variety of conductors and insulators are independently recognised and metals are associated with being good conductors.		1. Independently, the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit.
Physics	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Light			Light
Knowledge			1. Recognise that they need light in order to see things and that dark is the absence of light. 2. Notice that light is reflected from surfaces. 3. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. 4. Recognise that shadows are formed when the light from a			1. Recognise that light appears to travel in straight lines. 2. 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. 3. 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.

			light source is blocked by a solid object. 5. Find patterns in the way that the size of shadows changes.			4. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Skills (ARE)			1. Generally, accurate descriptions of how light is required in order to see are given. It is understood that dark is the absence of light. 2. Generally, accurate descriptions of how light is required in order to see are given. It is understood that dark is the absence of light. 3. Generally, it is understood that the light from the sun can be dangerous and some basic ways of protecting the eyes are understood. 4. Shadows are associated with a light source being blocked by something and patterns are found that determine the size of shadows. 5. There is a general awareness that the intensity, distance of light source, angle and object causing the shadow are factors in the size and shape of shadows.			1. Generally, it is recognised that light appears to travel in straight lines. 2. The idea that light travels in straight lines is used to explain that objects are seen because they give out or reflect light into the eyes. 3. Generally, there is a good understanding of how we see. Explanations and diagrams are used to describe the process. 4. Generally, the idea that light travels in straight lines is used to explain why shadows have the same shape as the objects that cast them. The size of shadows is predicted when the position of the light source changes.
Skills (GD)			5. Fluent explanations describing intensity,			4. The experience of light is beginning to be

			distance, angle and object, along with evidence from experiments are used to explain patterns in the way that the size of shadows change. Apply knowledge in other contexts: *-Opticians look through our pupils to see whether the retina looks healthy.* *-Some people wear glasses because the lens in their eye is not good enough.* *-White light is a mixture of all the colours.* *-Rainbows happen when rain splits up the white light.*			extended by looking at a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters. Apply knowledge in other contexts: *-You only see reflections of objects in a puddle or a lake when there is no wind so the surface is smooth like a mirror. When it is windy the light reflects in many different directions.* *-You cannot see around a corner because light only travels in straight lines.* -Investigate refraction; create own experiment, carry it out and explain findings using key vocabulary.

WT- a basic depth of learning (name, describe, recall, match, list, label, arrange, define, memorise).

ARE- (relate, separate, infer, interpret, identify patterns, organise, classify, predict, compare, explain, use evidence).

GD- deeper learning (design, synthesise, apply concepts, create, prove).

GD- http://www.jbprimaryscience.co.uk/assessment

lesson plan ideas https://www.stem.org.uk/primary-science

Bloom's Taxonomy Verbs

	Taxonomy Level	Related Verbs (Useful for writing learning objectives)
Higher Order	Creating	create, invent, make, compose, design, construct, imagine, plan, produce, develop, combine
	Evaluating	evaluate, consider, recommend, judge, criticize, summarize, justify, assess, rate, decide
	Analysing	analyse, compare, classify, sort, point out, distinguish, categorize, select, choose, examine
	Applying	apply, use, solve, show, organize, generalize, produce, choose, complete
	Understanding	explain, discuss, predict, outline, match, rewrite, give examples, express, summarise
Lower Order	Remembering	name, describe, list, write, define, memorize, label, identify, locate, recite, state, recognise