Southbourne Junior School - Science Progression Map

Biology		
Year Group	Knowledge Children will know…	Skills Children will be able to…
3	Animals and Humans: ● Know that animals, including humans, get nutrition from what they eat ● Know that animals, including humans, need the right type of nutrition ● Know that animals, including humans, cannot make their own food (misconception) ● Know that humans and some other animals have skeletons ● Know that humans and some other animals have muscles ● Know that skeletons and muscles are for support, protection and movement	Animals and Humans: ● Observe and compare movement ● Compare and contrast the diet of different animals ● Classify animals according to what they eat ● Identify and classify animals with and without skeletons ● Use scientific evidence of food groups and how they keep us healthy ● Report on findings from enquiries ● Record findings in tables ● Record findings using simple scientific language ● Record findings using drawings and labelled diagrams ● Record results in a graph

	Plants: ● Know the functions of different parts of plants: - roots - stem - leaves - flowers ● Know what plants need for life and growth: - air - light - water - nutrients from soil - room to grow ● Know that requirements for life and growth vary from plant to plant ● Know the way in which water is transported within plants ● Know the role of flowers in the life cycle of flowering plants: - including pollination - seed formation - seed dispersal	Plants: ● Compare the effect of different factors on plant growth (light, water, fertiliser/soil type) ● Observe different stages of plant life cycles ● Identify differences and similarities in speed dispersal ● Observe how water is transported in plants ● Ask relevant questions and use different types of scientific enquiry to answer them ● Make systematic and careful observations ● Measure using standard units ● Gather, record and present data in a graph/chart ● Record findings using simple scientific language ● Record findings using drawings and labelled diagrams ● Use results to draw simple conclusions ● Make predictions and suggestions for future investigations

4	Living things and their habitats: ● Name a variety of living things in our local and wider environment (school grounds and coastal areas) ● Know the terms vertebrate and invertebrates ● Know that living things can be grouped in a variety of ways - classification ● Know that environments can change ● Know that changes in environments can sometimes pose dangers to living things	Living things and their habitats: ● Observe how our local environment changes over the year ● Observe human impact on our local environment (school grounds and coastal areas - including an area of outstanding natural beauty) ● Classify a wide selection of living things in our local environment that include: - animals - flowering plants - non-flowering plants ● Classify vertebrate animals: - fish - amphibians - reptiles - birds - mammals ● Classify invertebrates: - snails and slugs - worms - spiders - insects ● Record findings in tables ● Record findings using drawings and labelled diagrams

	Animals and Humans: ● Know the simple functions of the basic parts of the digestive system in humans: - Mouth - Tongue - Teeth - Oesophagus - Stomach - Small intestine - Large intestine ● Know about the different types of teeth in humans: - canines - incisors - molars ● Know the simple functions of different types of teeth: iIncisors used for cutting food - molar for grinding (chewing) - canines for tearing food ● Know what producers, predators and prey are ● Know a food chain has a producer, predator and prey	Animals and Humans: ● Compare the differences in the teeth of carnivores and herbivores ● Set up a simple practical enquiry and use results to draw simple conclusions to find out what damages teeth ● Identify the differences between producers, predators and prey ● Construct and record a variety of food chains ● Interpret a variety of food chains ● Identify producers, predators and prey in a food chain ● Record findings using simple scientific language and labelled diagrams
5	Animals Including Humans ● Know the stages in the growth and development of humans ● Know the changes experienced in puberty (PSHE link) ● Know that the gestation period of animals and humans vary	Animals Including Humans: ● Describe the stages and changes as humans develop to old age

	Living Things and their Habitats ● Know the life cycle of - a mammal - an amphibian - an insect - a bird ● Know the life process of: - asexual and sexual reproduction in plants - sexual reproduction in animals	Living Things and their Habitats: ● Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ● Describe the life process of asexual and sexual reproduction in some plants and animals ● Use scientific diagrams and labels ● Observe changes in an animal over a period of time (tadpoles in the pond) ● Record findings using increasingly complex scientific language ● Record findings using increasingly complex scientific diagrams
6	Evolution and Inheritance ● Know that fossils provide information about living things that inhabited the Earth millions of years ago ● Know that living things produce offspring of the same kind ● Know that normally offspring vary ● Know that offspring are not identical to their parents ● Know that characteristics are passed from parents to their offspring (e.g. dogs crossbreeding) ● Know that variation in offspring can make animals more or less able to survive in particular environments ● Know that adaptation may lead to evolution ● Know about the palaeontologist Mary Anning ● Know about the ideas of evolution developed by Charles Darwin and Alfred Wallace	Evolution and Inheritance: ● Observe and raise questions about how animals are adapted to their environment ● Compare how living things are adapted to survive in extreme conditions (e.g. cactus, penguin, camels) ● Analyse the advantages and disadvantages of specific adaptations (e.g. having a long and short beak, having gills or lungs, tendrils on climbing plants) ● Identify scientific evidence that has been used to support or refute ideas or arguments ● Record findings using increasingly complex scientific language ● Record findings using increasingly complex scientific diagrams ● Identify scientific evidence that has been used to support or refute ideas or arguments

	Living things and their Habitats ● Know that living things are classified into broad groups according to common observable characteristics: - Invertebrates - Vertebrates - Mico-organisms ● Know the similarities and differences of why living things are placed in these groups ● Know about Carl Linnaeus - a pioneer of classification	Living things and their Habitats: ● Classify microorganisms, plants and animals and describe how these can be subdivided ● Identify scientific evidence used to support or refute ideas or arguments ● Record findings using simple scientific language and labelled diagrams ● Record data in classification keys
	Animals including Humans ● Know the main parts of the human circulatory system: - heart - blood vessels - blood ● Know the functions of the: - Heart - pumps blood by squeezing and relaxing in a regular rhythm - Blood vessels - Blood vessels are a series of tubes inside your body. They move blood to and from your heart - Blood - carries nutrients throughout the body, provides oxygen to the body, keeps you from getting sick ● Know the impact of: - diet on the way their bodies function - exercise on the way their bodies function - drugs on the way their bodies function ● Know that water, after oxygen, is the second most important substance for human health	Animals including Humans: ● Take measurements with accuracy and precision (e.g. blood pressure monitor) ● Take repeat readings when appropriate ● Report and present findings, including causal relationships and a degree of trust in results ● Plan different scientific enquiries to answer questions, including recognising and controlling variables where necessary ● Record findings using simple scientific language and labelled diagrams ● Record findings in tables and graphs (scatter/bar/line) ● Report and present findings, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms ● Use test results to make predictions to set up further comparative tests ● Identify scientific evidence that has been sued to support or refute ideas or arguments

	• Know water is mainly important for the digestive system, because it contributes to the constant supply and export of products and substances • Know the transport of nutrients can only take place through a solvent (e.g. water) • Know water is of vital importance that the body temperature stays at a standard level • Know water takes up heat and transports it out of the body while we are transpiring • Know we cannot survive a few days without water	

Year 3/4 Vocabulary	Year 5/6 Vocabulary
All year groups using the vocabulary of independent (change), dependent (measure) and control variable (same).	
• Photosynthesis • Pollen • insect/wind pollination • seed dispersal • nutrients, minerals • Absorb • Classification • Habitat • Migrate • Hibernate • Herbivore • Carnivore • Omnivore	• Life cycle • Reproduce • Sexual and asexual • Reproduce • Fertilisation • Metamorphosis • Vertebrates • Amphibians • Reptiles • Mammals • Warm-blooded • Cold-blooded • Invertebrates

• Producer • Predator • Prey	

Chemistry		
Year Group	Knowledge	Skills
3		
4	States of Matter: • Know the difference between a solid, a liquid and a gas • Know that some materials change state when they are heated or cooled • Know that different materials change state at different temperatures • Know what evaporation is and where it takes place in the water cycle • Know that the rate of evaporation changes with temperature • Know what condensation is and where it takes place in the water cycle	States of Matter: • 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 • Measure or research the temperature, in degrees Celsius (°C), at which changes of state happen • Set up a practical enquiry using comparative and fair testing • Use a thermometer to take accurate measurements • Make predictions for new values and suggest improvements for future enquiries • Ask relevant questions and use different types of scientific enquiry to answer them • Gather, record and present data in a graph/chart • Record findings using simple scientific language • Record findings using labelled diagrams • Record findings in a table

		• Report on findings from enquiries • Use results to draw simple conclusions • Use straightforward scientific evidence to answer questions or to support their findings
5	Properties and changes of materials: • Know the following properties of materials: - hardness - solubility - transparency - conductivity (electrical and thermal) - response to magnets (magnetism) • Know the processes of: - melting - dissolving • Know how to separate materials using: - sieving - filtering - evaporating • Know that dissolving mixing and changes of state are reversible • Know irreversible changes often create new materials (e.g. burning) • Know about chemists such as Spencer Silver (glue for sticky notes) and Ruth Benerito (wrinkle free cotton)	Properties and changes of materials: • Compare materials based on their properties: - hardness - solubility - transparency - conductivity (electrical and thermal) - response to magnets (magnetism) • Classify materials based on their properties: - hardness - solubility - transparency - conductivity (electrical and thermal) - response to magnets (magnetism) • Plan a comparative and fair test to investigate the particular uses of everyday materials (including metals, wood and plastic) • Explore and observe reversible changes including: evaporating, sieving, filtering and melting • Explore and observe irreversible changes including: burning, rusting and chemical reactions (e.g. vinegar with bicarbonate of soda) • Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Use a variety of equipment (such as thermometers) to

		take accurate measurements with increasing accuracy and precision • Take repeat readings where appropriate • Record data and results of increasing complexity using tables and graphs (scatter/line/bar) • Record data and results of increasing complexity using diagrams and labels • Use test results to make predictions to set up further comparative tests • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results • Identify scientific evidence that has been sued to support or refute ideas or arguments
6		

Year 3/4 Vocabulary	Year 5/6 Vocabulary
All year groups using the vocabulary of independent (change), dependent (measure) and control variable (same).	
• Pressure • Erosion • Transportation • Melt • Solidify • Solid • Liquid	• Soluble • Insoluble • Reversible • Irreversible

• Gas • Melting • Condensation • Evaporation • Permeable • Impermeable	

Physics		
Year Group	Knowledge	Skills
3	Light: • Know that they need light in order to see things • Know that dark is the absence of light • Know that light can be reflected from surfaces • Know that light from the sun can be dangerous • Know how to protect their eyes from the sun • Know that shadows are formed when a light source is blocked by a solid object	Light: • Find patterns in the way that the size of shadows change • Set up simple practical enquiries • Carry out comparative and fair tests • Make systematic and careful observations • Take accurate measurements using standard units • Gather, record and present data • Use results to draw simple conclusions • Ask relevant questions and use different types of scientific enquiry to answer them • Gather, record and present data in a graph/chart • Record findings using simple scientific language • Record findings using labelled diagrams • Record findings in a table • Report on findings from enquiries • Use straightforward scientific evidence to answer questions or to support their findings

	Forces and Magnets: ● Know that different surfaces cause varying levels of friction ● Know that magnetic forces can act at a distance ● Know when magnets attract and repel ● Know which materials are magnetic ● Know that magnets have 'two poles'.	Forces and Magnets: ● Observe magnetic forces ● Compare and group/sort a variety of everyday materials on the basis of whether they are attracted to a magnet ● Raise relevant questions and carry out a scientific enquiry to find an answer to them ● Carry out comparative and fair tests ● Gather, record and present data ● Use results to draw simple conclusions ● Make systematic and careful observations ● Record findings using simple scientific language ● Record findings using labelled diagrams ● Record findings in a table ● Report on findings from enquiries ● Use results to draw simple conclusions ● Suggest improvements and raise further questions for future enquiries ● Use straightforward scientific evidence to answer questions or to support their findings
4	Sound: ● Know that sounds are made through vibration ● Know that vibrations from sounds travel through a medium to the ear ● Know the pitch and volume of sounds can be changed ● Know that sounds get fainter as the distance from the sound source increases	Sound: ● 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 ● Gather and record data to help answer questions ● Ask relevant questions and use different types of scientific enquiry to answer them ● Make systematic and careful observations ● Use data loggers to take measurements

		• Gather, record and present data in a graph • Record findings using simple scientific language • Record findings using labelled diagrams • Record findings in a table • Report on findings from enquiries • Use results to draw simple conclusions • Suggest improvements and raise further questions for future enquiries • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings
	Electricity: • Know common appliances that run on electricity • Know the name of the basic parts of a simple series circuit: - cells - wires - bulbs - switches - buzzers - motors • Know that a bulb will light in a series circuit as a complete loop with a battery • Know that a switch opens and closes a circuit (a bulb lighting in a series circuit) • Know which materials are conductors (metals) • Know which materials are insulators (plastic)	Electricity: • Construct a simple series electrical circuit with the components: - cells - wires - bulbs - switches - buzzers - motors • Observe patterns in the brightness of a bulb according to the number of cells added to a circuit • Carry out a comparative test • Report on findings using simple scientific language • Record findings using simple scientific language • Record findings using labelled diagrams • Report on findings from enquiries • Use results to draw simple conclusions

		• Suggest improvements and raise further questions for future enquiries • Identify differences, similarities or changes related to simple scientific ideas and processes
5	Space: • Know that the sun is a star at the centre of our solar system • Know the solar system has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune • Know that a moon is a celestial body that orbits a planet (Earth has one moon, Jupiter has four large moons and numerous smaller ones) • Know how the Earth moves in relation to the sun • Know how other planets move in relation to the sun • Know how the Moon moves in relation to the Earth • Know about the work of scientists Ptolemy, Alhazen and Copernicus (understanding how the geocentric model of the solar system gave way to the heliocentric model)	Space: • Compare the time of day at different places on the Earth • Identify scientific evidence that has been used to support or regulate ideas or arguments • Report and present findings from enquiries in oral and written forms
	Forces: • Know what gravity is • Know what air resistance is • Know what water resistance is • Know what friction is • Know that levers, pulleys and gears, allow a smaller force to have a greater effect	Forces: • Plan an investigation to answer questions about: - air resistance - water resistance - friction • Plan different scientific enquiries to answer questions, including recognising and controlling variables where necessary

		• Take measurements using a range of scientific equipment, with increasing accuracy and precision • Take repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels • Record data and results of increasing complexity using tables and graphs (scatter/line/bar) • Use test results to make predictions to set up further comparative and fair tests • Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms • Identify scientific evidence that has been used to support or refute ideas or arguments
6	Light: • Know that light appears to travel in straight lines • Know that objects are seen because they give out or reflect light into the eye • Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • Know why shadows have the same shape as the objects that cast them	Light: • Plan a fair-test which recognises and controls variables • Use test results to make predictions to set up further scientific enquiries • Explain the degree of trust in results • Take measurements using a range of scientific equipment (light data loggers), with increasing accuracy and precision • Take repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels • Record data and results of increasing complexity using tables and graphs (scatter/line/bar) • Report and present findings from enquiries, including conclusions and causal relationships, in oral and written

		forms • Identify scientific evidence that has been used to support or refute ideas or arguments
	Electricity: • Know the symbols that can be used when representing a simple circuit in a diagram • Know that the brightness of a lamp or the volume of a buzzer can be altered by the number and voltage of cells used in the circuit	Electricity: • Plan an enquiry to investigate how the brightness of a lamp is impacted by the number and voltage of cells used in the circuit • Plan an enquiry to investigate how the volume of a buzzer is impacted by the number and voltage of cells used in the circuit • Report and present findings from enquiries that compare variations in how components function, including: - the brightness of bulbs - the loudness of buzzers - the on/off position of switches • Recognise and control variables • Use results to make predictions to set up further comparative and fair tests • Identify scientific evidence that has been used to support or refute ideas or arguments

Year 3/4 Vocabulary	Year 5/6 Vocabulary
All year groups using the vocabulary of independent (change), dependent (measure) and control variable (same).	
• Opaque • Translucent • Transparent	• Gravity • Friction • Newtons

• Shadow • Reflect • Pitch • Cell • Conductor • Insulator	• Volts • Components • Resistance

Environmental science		
Year Group	Knowledge	Skills
3	Rocks: • Know that soils are made from rocks and organic matter • Know, in simple terms, how fossils are formed when things that have lived are trapped within rock • Know about different kinds of rocks and soils, including those in the local environment • Know that rocks might change over time	Rocks: • Identify similarities and differences between soils • Observe different kinds of rocks: - appearance (colour, shape - simple physical properties (texture, size, hardness) • Classify different rocks according to their: - appearance (e.g.colour, shape, size) - simple physical properties (e.g. texture, hardness) • Take measurements using standard units • Report on findings using simple scientific language and labelled diagrams • Plan a scientific enquiry to investigate: - what happens when rocks are rubbed together - what changes occur when rocks are in water • Record findings using simple scientific language • Identify differences, similarities or changes related to simple scientific ideas and processes

Year 3/4 Vocabulary	Year 5/6 Vocabulary
All year groups using the vocabulary of independent (change), dependent (measure) and control variable (same).	
• Pressure • Erosion • Permeable • Impermeable • Reversible • Irreversible • Igneous • Sedimentary • Metamorphic • Magma	

Working scientifically key vocabulary	
Y3/4	**Y5/6**
• Fair testing • Thermometer • Data logger • Stopwatch • Estimate • Accurate • Timer • Data	• Variables • Justify • Argument • Causal relationship • Accuracy • Precision • Scatter graphs • Line graphs

• Diagram • Identification key • Chart • Bar chart • Prediction • Similarity • Difference • Evidence • Findings • Criteria • Values • Properties • Characteristics • Conclusion • Explanation • Reason • Evaluate • Improve • Independent variable • Dependent variable • Control variable	• Force meter