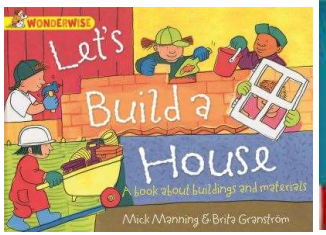
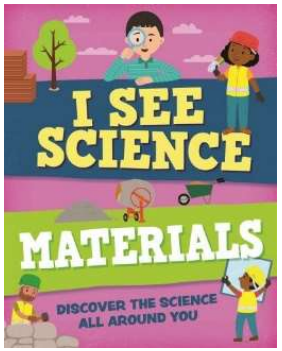
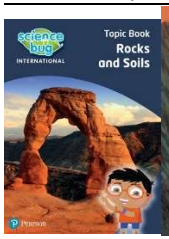
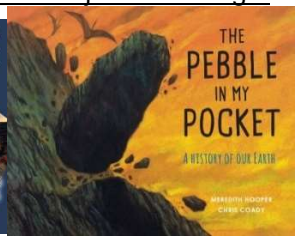
Autumn Science – Medium Term Plan				
	Substantive/semantic knowledge – the stuff of science	**Disciplinary/procedural knowledge – how Science is studied.**	**Vocabulary**	**Big Question and linked texts**
EYFS Working Scientifically Materials	I know what wood is what plastic is what rock is what cardboard is what sand is what water is that wood, plastic, cardboard, water and sand are called materials what touch is what sound is what sight is what smell is I know that touch, sound, sight and smell are called senses	I know how to explore materials using my senses some simple words to describe what I can see: soft, hard, see through, bendy, rough, smooth, wet dry I know how to ask questions to find out more and to check what has been said to them. articulate ideas and thoughts in well formed sentences use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen. Use new vocabulary in different contexts how to explore and identify everyday materials including wood, plastic, metal, water, fabric and rock how to sort objects suggest differences between materials and changes that they notice, including melting in the sun and 'drting' up,	Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, wood, plastic, metal, water, fabric, properties, materials. Question, answer, equipment	What are everyday materials? Can I describe materials? Can I sort materials? <u>Resources/staff subject knowledge:</u>

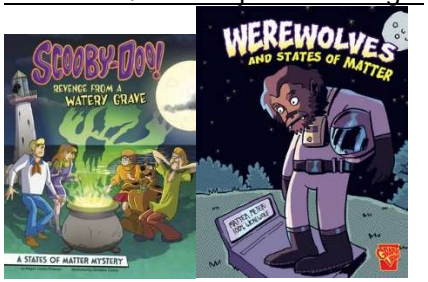
		growing, squashing and squeezing. about some important processes and changes in the natural world around me including the seasons and changing states of matter.		
Year 1 – Materials Working Scientifically Energy Materials	I know what weather is. what the seasons are. what temperature is. what day length is. that weather, temperature and day length change with the seasons. that temperature is measured in degrees with a thermometer. that the material is what something is made from that fabric, paper, clay, plastic, wood and metal are materials. that materials feel different, look different and have different uses. These are properties. that some properties of materials are: hard, rough, smooth, strong, soft, bendy, rigid, absorbent,	**I know** that scientists ask questions and make predictions. that scientists observe, test and measure. that scientists gather and record data. **I know how to** ask simple questions and recognise that they can be answered in different ways. observe temperature closely, using simple equipment; perform simple tests; identify and classify. gather and record data to help in answering questions. distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic,	Fair test, careful observation Observe, observing, identify, classify, sort, group record, diagram, chart, map, data. Compare, contrast, describe. Weather, sunny, cloudy, stormy, windy, cold, hot, warm, wet Thermometer, temperature seasons, Summer, Autumn, Winter, Spring Material, wood, plastic, glass, metal, water, rock, properties, clay Hard/soft, stretchy/rigid, shiny/dull, rough/smooth, bendy/ not bendy, absorbent/not absorbent	What is the weather like today? What temperature is it? What has happened to the temperature over the week? What does the word material mean? What is the difference between an object and material? Can they recall any different materials from the previous session? Can the children identify the correct object that the material is made from? What have all the objects got in common? How do you know? Resources/staff subject knowledge:   TF3 - BBC Weather

	shiny, dull, flexible. that observation is watching closely. that predication is making a guess based on facts. that investigating is testing. that results are what we find out from testing. that data is results. that comparing is looking at what is the same and what is different that classifying is sorting into groups.	glass,clay, metal, water, and rock describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties.		https://office365.discoveryeducation.co.uk/learn/videos/ab03ae09-fe4e-49d9-8e21-f70b67203e05/?embed=false&embed_origin=false https://office365.discoveryeducation.co.uk/learn/player/84495683-fd78-4ca5-882a-de28498b75e7?utm_source=84495683-fd78-4ca5-882a-de28498b75e7&utm_medium=quicklist&utm_campaign=hublinks BSE-at-Home-Investigation-question-ideas.pdf (scienceoxford.com) http://espresso/primary_uk/subject/module/book/item
Year 2 - Materials Working Scientifically Materials	I know what scientists mean by the word material. that materials with different properties are suitable for different uses. that the shape and the shapes of solid objects made from some materials can be changed by squashing, bending,	I know that scientists ask questions and make predictions that scientists observe and measure. that scientists gather and record data. I know how to	Fair test, careful observation identify, classify, sort, group record, diagram, chart, map, data Compare, contrast, describe Wood, metal, plastic, glass, brick, rock, cardboard, squashing, bending, twisting,	Why are some materials more suitable than others? How can the shape of some materials be changed?

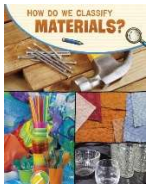
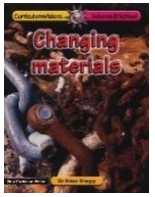
	twisting and stretching. that when we decide how to classify objects and materials, we label our groups. these labels are called criteria that observation over time is watching closely and carefully and looking for changes that predication is making a guess based on facts and evidence what a Fair Test is. that testing needs to be fair to be reliable. that we collect data from our results. that we can share our data in a diagram, a map or a chart. what diagrams, maps and charts are that classifying is sorting into groups by comparing, contrasting and describing materials and objects based on specific criteria	ask simple questions and recognise that they can be answered in different ways. observe closely, using simple equipment; perform simple tests; identify and classify gather and record data to help in answering questions 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.	stretching	Resources/staff subject knowledge:   Year 2: Uses of Everyday Materials | STEM The Three Little Pigs-Materials and their uses | STEM

Year 3 - Rocks Working scientifically Rocks and soils	I know: were rocks are found that scientists who study rocks are called Petrologists That there are different rocks that limestone, sandstone, chalk, granite, slate and marble are different types of rock that different rocks have different properties that rocks are non-living what igneous means what Metamorphic means	I know that scientists ask questions and make predictions that scientists observe and measure. that scientists gather and record data. I know how to ask relevant questions and using different types of	Research, relevant questions, scientific enquiry, comparative test, systematic, accurate measurement, thermometer, Gather, record, classify, present, drawings, labelled diagrams, keys, bar charts, tables Appearance, properties, absorbent/not absorbent, fossils, sedimentary rock, metamorphic, igneous,	What is extinct? Why do you think they died out? How do you know they existed? What are fossils? What do I mean by classification? How are rocks formed? How are they classified? How can we record our findings?

	what sedimentary means that rocks can be classified into groups called igneous, sedimentary and metamorphic. what a fossil is. how a fossil is formed that soils are made from rocks and organic matter. what a magnifying glass is and what it does that observations can be made more precise with a magnifying glass that predication is making an educated guess based on facts and evidence that the different elements of a Fair Test are called variables. that what we are measuring is the dependent variable. that we can record our results data in simple bar charts and tables with the correct labels. that a comparative test means comparing the results of one or more materials.	scientific enquiries to answer them. 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 set up simple practical enquiries, comparative and fair tests. create and devise criteria for classifying and sorting groups of materials of objects justify my decisions backed up by evidence.	organic matter, grains, crystals	Resources/staff subject knowledge:  

Year 4 – States of Matter Working Scientifically Materials	I know what a solid is what a liquid is what a gas is that solid, liquid and gas are called states of matter that a gas is often invisible that air is a gas that a material can be a solid, liquid or a gas. that temperature can effect the state of matter in some materials that a liquid can change into a solid or a gas that a gas can change into a liquid that a solid can change into a liquid what a chemical reaction is that combining two materials can create a chemical reaction that water has three states ice, water and water vapour that all water is part of the water cycle all four parts of the water cycle that changing a variable in fair test may effect the	I know that scientists ask questions and make predictions that scientists observe and measure to collect data that scientists gather and record data to prove or disprove their predictions. I know how to ask relevant questions and using different types of scientific enquiries to answer them. set up practical enquiries, comparative and fair tests. use scientific vocabulary to explain what the results of an investigation show. 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	Research, relevant questions, scientific enquiry, comparative test, systematic, accurate measurement, thermometer, data logger Gather, record, classify, present, drawings, labelled diagrams, keys, bar charts, tables Solid, melt, freeze, liquid, evaporate, condense, gas, container changing state, degrees Celsius, thermometer, water vapour.	How do heating and cooling change the states of matter? What is the water cycle? What are solids, liquids and gases? <u>Resources/staff subject knowledge:</u>  Do gases weigh anything? https://www.bbc.co.uk/bitesize/clips/zt3fb9q How many of these gases have they heard of? Show children the video clip (no commentary) https://www.bbc.co.uk/bitesize/clips/zmbyqk7, What will children measure, e.g. depth of water (nearest mm) left, time taken to dry completely? How often will they take measurements? How will they record the results? What do they think will happen (prediction)? How will they ensure their test is fair? https://www.bbc.co.uk/bitesize/clips/z684d2p The Water Cycle https://www.youtube.com/watch?v=qrLEHV580Mg https://www.bbc.co.uk/bitesize/clips/z8qtfg8

	outcome	cycle and associate the rate of evaporation with temperature.		
Year 5 - Materials Working Scientifically	I know what hardness is what transparency is	I know I know that scientists ask questions and make predictions.	Plan, variables, accuracy, precision, repeat readings Patterns, systematic, quantitative measurements, identify, classify, describe	Which materials are suitable based upon their properties? What is a solution and a mixture? How can mixtures be separated? What are reversible and irreversible changes?

Materials	what absorbancy is what durability is what conductivity is what insulation is what thermal conductivity is what thermal insulation is what electrical conductivity is what electrical insulation is what suitability and fit for purpose mean what materials are what soluble, solute, solution and solubility mean what a mixture is what the difference between a solution and a mixture is. What filtration, decanting, sieving and evaporation are. what density is what reversible and irreversible changes are what oxidisation is	that a predication is called a hypothesis I know that scientists observe and measure in order to collect data. I know that scientists gather and record data. I know that data will either prove or disprove a hypothesis I know how to plan different and implement types of scientific enquiries to answer questions, including recognising and controlling variables when necessary. use test results to make predictions to set up further comparative and fair tests. take measurements, using a range of scientific equipment, including a thermometer, data logger and voltmeter with increasing accuracy and precision, taking repeat reading where appropriate, Record data and results of increasing complexity (scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs) Report and present findings from enquiries, including conclusions, causal relationships and	Scientific diagrams, labels, classification keys, scatter graphs, bar and line graphs Hardness, solubility, transparency, conductive, dissolve, separate, solution, filtering, reversible, irreversible, magnetism, rusting, quantitative measurements conductivity, insulation	<u>Resources/staff subject knowledge:</u>  

		explanations of a degree of trust in results, in oral and written form such as displays or presentations 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 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 for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changesExplain that some changes result in the formation of new materials, and that this kind of change		

		is not usually reversible.		
Year 6 Evolution Working Scientifically Evolution and Inheritance	I know what inheritance is what variation is that living things produce offspring of the same kind that normally offspring vary and are not identical to their parents the difference between inheritance and variation what inheritance and variation look like in offspring	I know that scientists ask questions and make predictions. that scientists observe and measure. that scientists gather and record data. I know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables when necessary.	Plan, variables, accuracy, precision, repeat readings Patterns, systematic, quantitative measurements, identify, classify, describe Scientific diagrams, labels, classification keys, scatter graphs, bar and line graphs Change, fossils, offspring, variation, adaptation,	Why do living things change over time? What traits do we inherit? What is evolution? How does habitat influence evolution?

	what inherited traits are how traits are inherited across generations what adaptation is that environment is fundamental to adaptation. that adaptation is fundamental to survival.	use test results to make predictions to set up further comparative and fair tests. take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat reading where appropriate, record data and results of increasing complexity (scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs) 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.	characteristics, evolution, inherited, acquired, environment, advantageous vs disadvantageous.	Resources/staff subject knowledge: