Chemistry

KS1 Working Scientifically:
1. asking simple questions and recognising that they can be answered in different ways
2. observing closely, using simple equipment
3. performing simple tests
4. identifying and classifying
5. using their observations and ideas to suggest answers to questions
6. gathering and recording data to help in answering questions

Year 1	Knowledge	Vocabulary	Skills
Autumn Term	**Everyday materials** • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, 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	Materials, objects, wood, plastic, metal, liquid, gas, solid, stretch, bend, waterproof, shiny	1. *e.g. which material would be most suitablefor a waterproof coat?* *4. e.g. identify a range of classroom objects and classify based on the material they are made from* *5. e.g. why is the table made from wood and not glass?*

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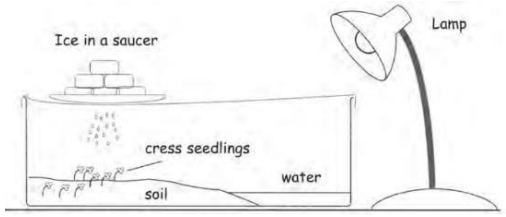
LKS2 Working Scientifically:	
1.	asking relevant questions and using different types of scientific enquiries to answer them
2.	setting up simple practical enquiries, comparative and fair tests
3.	making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
4.	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
5.	recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
6.	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
7.	using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
8.	identifying differences, similarities or changes related to simple scientific ideas and processes
9.	using straightforward scientific evidence to answer questions or to support their findings

Year 4	Knowledge	Vocabulary	Skills
Summer term	**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, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Solid, liquid, gas, melt, boil, freeze, solidify, evaporate, condensate, degrees Celsius, state, water cycle, precipitation, transpiration	2. 3. 4. 5. 8. 9. *e.g. sort a series of everyday objects into solids, liquids andgases, based on their properties* 2. 3. 6. 7. 8. 9. *e.g. to change the temperature of a series of objects (candle wax, chocolate, water) to investigate how they change state, measuring the temperature at which theychange* 2. 3. 5. 9. *e.g. set up a mini water cycle to identify the role condensation and evaporation play in the reversible process.* 

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UKS2 Working Scientifically:
1. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 2. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
3. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
4. using test results to make predictions to set up further comparative and fair tests
5. 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
6. identifying scientific evidence that has been used to support or refute ideas or arguments.

Year 5	**Knowledge**	**Vocabulary**	**Skills**
Autumn term	**<u>Properties and Changes of Materials</u>** • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	Solution, solute, solubility, dissolve, filter, separate,mixture, sieve, hardness, transparency,electrical conductivity, thermal conductivity, reversible change, irreversible change, permeable	1. 2. 3. 4. 5. 6. *e.g. Investigate the effects of reversible and irreversiblechanges in a variety of materials, recording results* *e.g. 'Which is the best filter?' Suggest different filters totry and separate material, for example: washed gravel,washed sand, cotton wool, steel wool, muslin or nylon tights.* *e.g. classify a range of materials using an increasinglyadvanced techniques including testing solubility, hardness, conductivity and magnetism*

Glossary

Aim – what you're trying to find out in an experiment
Bend – to force an object to change its shape

Boil – the point where a liquid reaches a temperature that it turns into a gas

Conclusion – a simple sentence that sums up what you found in an investigation **Condensate** – when a gas cools and turns into a liquid

Degrees Celsius – a measure of temperature(°c)

Dissolve – when a solid break up completely into a liquid to make a solution

Electrical conductivity – the measure of a material's ability to allow electricity to pass through it

Evaporate – when a liquid is heated up and turns into a gas

Filter – separating bits of solid from a liquid

Freeze – when a liquid is cooled down and it turns into a solid
Gas – one of the states of matter – very lightand spreads out

Hardness – the quality or condition of beinghard

Irreversible change – a change to a material's state that does not allow a return to its formerstate

Liquid – one of the states of matter – runnyand takes the shape of its container

Materials – what something is made of

Melt – when a solid is heated up and turnsinto a liquid

Metal - a material which is typically hard andshiny and solid at room temperature

Mixture – a combination of two (or more)chemically unconnected substances

Objects – what something is e.g. a pencil orruler

Permeable - a material which allows water tosoak through it
Plastic – a man-made material made fromorganic polymers

Precipitation – rain, snow, sleet or hail thatfalls from the sky

Prediction – what you think will happen in an investigation
Reversible change – a change in a material'sstate that allows it to return to its former state

Separate – to split up a mixture of differentmaterials

Shiny – a material that can reflect light

Sieve – a piece of equipment with small holesthat allows material to be separated

Solid – one of the states of matter – keeps itsshape and you can hold it

Solidify – make or become hard or solid

Solubility – the measure of whethersomething will dissolve in water

Solution – a mixture formed when a soliddissolves in a liquid

State – the form a material can take (solid,liquid or gas)

Stretch – to be made longer or wider withoutbreaking

Thermal conductivity - the measure of a material's ability to allow electricity to passthrough it

Transparency – see-through

Transpiration – water vapour passing from aplant into the atmosphere

Water cycle – the continuous process that allows water to circulate between the Earth'soceans and atmosphere

Waterproof – does not allow water to passthrough it

Wood - the hard fibrous material that formsthe main substance of the trunk or branchesof a tree

Variable – a factor of an investigation that youwill change or measure