

Science – CHEMISTRY – Performance Descriptors

Progress Points	Chemistry
Year 9 45 44 43 42	<ul style="list-style-type: none"> • Describe and explain the features of the reactivity series. Give examples of why the reactivity series is important. • Describe the environmental impacts of metal extraction. Describe how recycling of metals reducing damage to the environment. • Describe how man-made polymers are made in simple terms. Describe uses for man-made polymers. • Explain how metal-based composites were developed. Describe the properties and uses of metal-based composites. • Explain how plastic-based composites were developed. Describe the properties and uses of plastic-based composites. • Describe the effects of global warming. Explain the effects of global warming on living things. Evaluate the arguments for and against pollution causing global warming • Describe resources that the Earth provides. Explain how human activity limits these resources. Justify decisions about making changes to the environment.
Year 8 38 37 36 (35)	<ul style="list-style-type: none"> • Describe where carbon and its compounds are used. Explain different ways in which carbon is important. Describe the features of the carbon cycle. • Describe oxidation and decomposition reactions. Explain the differences between oxidation and thermal decomposition. • To represent and explain displacement reactions using formulae and equations. To make inferences about reactivity from displacement reactions • Recognise that water is one product of neutralisation. Explain the formation of salt and water during neutralisation. Describe the observations of reactions between acids and metal, and acids and carbonate that tell us that a chemical reaction is taking place. • Identify and describe the features of endothermic and exothermic reactions. Explain the uses of both types of reactions. • Describe the equation for combustion and incomplete combustion. Identify and describe the dangers of incomplete combustion. • Summarise the reactants and products of complete combustion. Compare the products of complete and incomplete combustion. Explain what is meant by the conservation of mass. • Describe how combustion contributes to acid rain. Describe the social, environmental and economic impacts of acid rain.

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Year 7 35 34 33 (32)	<ul style="list-style-type: none"> • Use indicators to identify acids and alkalis. Analyse data from different indicators. Compare the effectiveness of different indicators. • Identify some everyday substances that contain acids and alkalis. Explain the properties and hazards of acids and alkalis. Give an example of an indicator and state why indicators are useful. • Explain how scientists organised the Periodic table. Describe key features of the periodic table. Give examples of group patterns and behaviour • Define the term elements, use symbols and link the organisation of the periodic table to element features. Use ideas and evidence to explain where and why elements and compounds were found. • Describe an example of a compound and represent a chemical reaction using a simple model. Explain the differences between chemical and physical changes in terms of atoms. • Identify some common properties of metal elements and non-metal elements and their uses. Classify metals and non-metals using their properties. Identify similarities and differences between metals. • Identify mixtures using chromatography. Explain how to separate a mixture using chromatography and interpret chromatograms. Explain the term solvent • Describe the process of distillation. Identify the uses and advantages of distillation. Describe the composition of air. Explain how distillation can be used to separate gases in air. • Describe what is meant by the terms concentration and pressure. Use ideas about particles to explain the effects of pressure. • Make predictions about floating and sinking using ideas about density. Use the particle model to explain density differences between gases and calculate the density of solids. • Explain how solids, liquids and gases can change with increasing energy. Identify and recognise the process of sublimation. • Use the correct terminology and the particle model to describe changes of state, including evaporation. • Describe how solids, liquids and gases behave when heat is applied to them. • Explain why most water is not pure, and why this is not necessarily a problem. Explain why contaminated water is a problem and identify what can be done about it. • Describe how diffusion occurs in liquids and gases. Make predictions about the factors affecting the rate of diffusion. • Describe how to separate mixtures. Explain appropriate separation techniques. Describe the process of dissolving and the effect of temperature. Describe methods for producing crystals of different sizes. • Able to 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. • Explain the advantages and disadvantages of each method of separation technique.

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Year 6 32 31 30 (29)	<ul style="list-style-type: none"> • Able to describe 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. • Able to demonstrate that dissolving, mixing and changes of state are reversible changes. Able to describe examples of irreversible changes. • Able to describe my knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Identify and describe the features of chemical reactions. Colour change, temperature change, producing a noise, bubbling or fizzing. • Able to know that some materials will dissolve in liquid to form a solution. Able to describe how to recover a substance from a solution. • Compare and contrast different everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductive and response to magnets. • Describe how the particles in a solid, liquid and gas moves from state to state. • Describe changes of state in terms of particles • Compare the properties of solids, liquids and gases. Describe the movement of solids, liquids and gases. • Give reasons, based on evidence for the particular use of everyday materials, including metals, woods and plastics.
Year 5 29 28 27 (26)	<ul style="list-style-type: none"> • Define the term dissolving and provide simple explanations. • Recognise and identify the features of simple mixtures. • Describe the processes in the water cycle in the correct order. • Know the four changes of state and can give examples of changes of state. • Identify a material as a solid, liquid or gas by describing its properties. • Select and draw apparatus accurately; explain safety precautions. Use laboratory equipment safely to gather evidence. .
Year 4 25 24 23 (22)	<ul style="list-style-type: none"> • Recognise the differences between pure and impure substances. • Use a thermometer to measure temperatures and know at what temperature water changes state. • Know the names of some materials and can say how their properties affect the ways they are used • Identify key processes in the water cycle.
Year 3 21 20 19 (18)	<ul style="list-style-type: none"> • Recognise and name basic features of the water cycle. • Identify simple substances which melt and freeze. • Identify the names of different materials and begin to make simple observations.