

Level 8 Pathway Chemistry

Year	Can
11	<ul style="list-style-type: none"> • Calculate chemical quantities in complex titrations involving concentrations in mole/dm³ or g/dm³ • Explain how to carry out a titration • Explain why a particular reaction pathway is chosen using appropriate data such as atom economy or yield • Calculate theoretical mass of product and percentage yield for a given reaction • Evaluate the use of nanoparticles for a specified purpose • Compare group 1 and transition elements • Complete complex gas calculations • Demonstrate how amino acids can form condensation polymers • Interpret instrumental results given appropriate data • Evaluate instrumental methods compared with simple chemical tests • Justify the conditions used commercially for the Haber Process
10	<ul style="list-style-type: none"> • Construct Balanced symbol and Ionic Equations independently • Create Half equations relating to electrolysis including Redox & OIL RIG • Use Le Chatelier's principle to predict changes to equilibrium • Use Mass = Mr/Mole to calculate complex Reacting Mass calculations • Draw & explain the energy profiles for Exo & Endothermic Reactions. • Draw a tangent to a curve to calculate the initial rate of a reaction • Describe & compare inter and intramolecular bonding • Solve concentration calculations (g/dm³) • Evaluate the limitations of the particle theory
9	<ul style="list-style-type: none"> • Compose Balanced Symbol Equations • Solve Conservation of Mass calculations • Calculate RF values in Chromatography • Calculate the rate of a reaction using the gradient of a straight line • Describe melting & boiling points in terms of intermolecular forces • Describe & explain factors that affect the rate of a reaction. • Describe & explain intramolecular bonds linking bonding to properties • Link human activities to the formation of acid rain including the symbol equations
8	<ul style="list-style-type: none"> • Construct symbol equations for reactions • Select a scale and draw an axis for a graph unsupported • Model changes of state using diagrams and changes in terms of energy • Construct the word equations for the formation of acid rain • Describe differences between the 3 subatomic particles in atoms linked to an atomic diagram • Represent the electronic structure of the first 20 elements.
7	<ul style="list-style-type: none"> • Construct word equations for reactions independently • Plot a graph independently • Utilise appropriate terminology for changes of state • Understand that elements are the building blocks of all matter • Justify why substances are classified as elements, mixtures or compounds • Predict the products of the combustion of hydrocarbons

Level 7 Pathway Chemistry

Year	Can
11	<ul style="list-style-type: none"> • Calculate chemical quantities in titrations involving concentrations in mol/dm³ or g/dm³ • Describe how to carry out a titration • Decide which reaction pathway is chosen using appropriate data such as atom economy or yield • Calculate theoretical mass of product and percentage yield for a given reaction • Link the use of nanoparticles to a specific purpose • Compare group 1 and transition elements • Complete gas calculations • Describe how amino acids can form condensation polymers • Interpret instrumental results given appropriate data • Compare instrumental methods with simple chemical tests • Explain the conditions used commercially for the Haber Process
10	<ul style="list-style-type: none"> • Balance Symbol and Ionic Equations independently • Create Half equations relating to electrolysis including Redox & OIL RIG • Use Le Chatelier's principle to describe changes to equilibrium • Use Mass = Mr/Mole to calculate Reacting Masses • Draw & explain the energy profiles for Exo & Endothermic Reactions. • Draw a tangent to a curve to calculate the initial rate of a reaction • Describe inter and intramolecular bonding • Solve concentration calculations (g/dm³) • Describe the limitations of the particle theory
9	<ul style="list-style-type: none"> • Compile Balanced Symbol Equations independently • Solve Conservation of Mass calculations • Calculate RF values in Chromatography • Calculate the rate of a reaction using the gradient of a straight line • Describe melting & boiling points in terms of intermolecular forces • Describe & explain factors that affect the rate of a reaction. • Describe intramolecular bonds linking bonding to properties • Link human activities to the formation of acid rain including the symbol equations
8	<ul style="list-style-type: none"> • Produce symbol equations for reactions • Conclude that mass is conserved in reactions • Select a scale and draw an axis for a graph • Explain changes of state in terms of energy • Compile the word equations for the formation of acid rain • Describe the 3 subatomic particles in atoms and recognise the electronic structure of the first 20 elements
7	<ul style="list-style-type: none"> • Construct word equations for reactions • Independently plot a graph with given scale • Employ correct scientific terminology for changes of state • State that elements are the building blocks of all matter • Classify substances as elements, mixtures or compounds, explaining the difference • Determine the products of the combustion of hydrocarbons

Level 6 Pathway Chemistry

Year	Can ...
11	<ul style="list-style-type: none"> • Calculate chemical quantities in titrations involving concentrations in mol/dm³ • Describe how to carry out a titration • Know that a reaction pathway is chosen based on data such as atom economy or yield • Calculate percentage yield using data for a given reaction • Describe the benefits of using nanoparticles • Compare group 1 and transition elements • Calculate the volume of a named gas at RTP • Describe how amino acids can form condensation polymers • Draw conclusions based on instrumental results • Know advantages of instrumental methods over simple chemical tests • Describe the conditions used commercially for the Haber Process
10	<ul style="list-style-type: none"> • Balance Symbol and complete Ionic Equations • Complete Half equations relating to electrolysis including Redox & OIL RIG • Recognise that Le Chatelier's principle describes changes to equilibrium • Use Mass = Mr/Mole and recognise this can be used to calculate reacting Masses • Describe the energy profiles for Exo & Endothermic Reactions. • Draw a tangent to a curve and recognise its use in calculating the initial rate of a reaction • Describe inter and intramolecular bonding • Make progress towards solving concentration calculations (g/dm³) • State the limitations of the particle theory
9	<ul style="list-style-type: none"> • Compile Balanced Symbol Equations • Solve Conservation of Mass calculations • Calculate RF values in Chromatography • Recognise the rate of a reaction can be calculated using the gradient of a straight line • Describe melting & boiling points in terms of particulate energy • Describe the range of factors that affect the rate of a reaction. • Describe intramolecular bonds bonding linking bonding to properties • Link human activities to the formation of acid rain including the word equations
8	<ul style="list-style-type: none"> • Produce symbol equations for reactions with support • Select a scale and draw an axis for a graph • Describe state of matter changes in terms of particles • Identify the 3 subatomic particles in atoms and recognise the electronic structure of the first 10 elements. • Identify the word equations for the formation of acid rain • Recognise that mass is conserved in reactions
7	<ul style="list-style-type: none"> • Develop word equations for reactions • Plot a graph with given scale and axis • Employ scientific terminology for changes of state • State that elements are the building blocks of all matter • Classify substances as elements, mixtures or compounds • Identify the products of the combustion of hydrocarbons

Level 5 Pathway Chemistry

Year	Can
11	<ul style="list-style-type: none"> Recognise that titration can be used to calculate an unknown concentration Describe how to carry out a titration Know that a reaction pathway is chosen based on data such as atom economy or yield Calculate percentage yield using data for a given reaction Identify some uses of nanoparticles List some differences between group 1 and transition elements Calculate the volume of a named gas at RTP with guidance Describe how amino acids can form condensation polymers Draw conclusions based on instrumental results Know advantages of instrumental methods over simple chemical tests Know the conditions used commercially for the Haber Process
10	<ul style="list-style-type: none"> Balance Symbol Equations Predict the products of electrolysis and state where they are formed Recall that Le Chatelier's principle is involved in reversible reactions Calculate relative formula mass and percentage composition calculations Draw the energy profiles for Exo & Endothermic Reactions. Recognise the rate of a reaction can be calculated using the gradient of a straight line Describe intramolecular bonding linking bonding to properties Recognise concentration can be expressed as g/dm^3 or mol/dm^3 Utilise particle theory in explanations where appropriate
9	<ul style="list-style-type: none"> Complete Balanced Symbol Equations Understand the principle of the Conservation of Mass Utilise Chromatograms to analyse substances Describe melting & boiling points in terms of particles Describe some factors that affect the rate of a reaction. Describe the main types intramolecular bonding Identify human activities which lead to the formation of acid rain including the word equations
8	<ul style="list-style-type: none"> Arrange word and symbol equations for reactions Select a scale and draw an axis for a graph Describe changes of state using diagrams in terms of particles Identify the word equations for the formation of acid rain Identify the 3 subatomic particles in atoms and draw a simple diagram. Recognise the electronic structure of the first 10 elements. Recognise that mass is conserved in reactions
7	<ul style="list-style-type: none"> Describe reactions in terms of Reactants \rightarrow Products Plot a graph with given scale and axis Understand the scientific terminology for changes of state State that elements are the building blocks of all matter Identify substances as elements, mixtures or compounds Identify the products of the combustion of hydrocarbons