Triple Science, Higher Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Reactivity of Metals	• Define the reactivity series and explain how it determines metal reactions with acids, water, and displacement reactions. Compare reactivity trends.	
	• Extraction of Metals – Describe reduction with carbon and electrolysis. Explain why some metals (e.g., aluminium) must be extracted using electrolysis. Discuss how the position of a metal in the reactivity series affects its extraction and applications in industry.	
	• Oxidation and reduction in terms of electrons - write ionic equations for displacement reactions and identify which species are oxidised and which are reduced in a given reaction, symbol equation or half equation.	
Reactions of Acids	• Define acids, bases, and alkalis in terms of proton donation and hydroxide ions. Explain the pH scale and how indicators such as universal indicator and litmus paper are used. Compare strong and weak acids in terms of ionisation.	
	• Neutralisation and Making Salts -Describe the process of making salts from acids and bases, including the role of different bases (oxides, hydroxides, and carbonates). Explain how salts are purified through crystallisation. Discuss the uses of salts in industry and medicine.	
	• Soluble salts - describe how to make pure, dry samples of named soluble salts from information provided.	
	• Required Practical 1: preparation of a pure, dry sample of a soluble salt.	
	• pH scale and neutralisation - describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution, use the pH scale to identify acidic or alkaline solutions.	

Triple Science, Higher Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Reactions of Acids	• Titrations - describe how to carry out titrations using strong acids and strong alkalis only (sulfuric, hydrochloric and nitric acids only) to find the reacting volumes accurately, calculate the chemical quantities in titrations involving concentrations in mol/dm3 and in g/dm3.	
	• Required Practical 2: determination of reacting volumes by titration.	
	• Strong and weak acids - use and explain the terms dilute and concentrated (in terms of amount of substance), and weak and strong (in terms of the degree of ionisation) in relation to acids, describe neutrality and relative acidity in terms of the effect on hydrogen ion concentration and the numerical value of pH.	
Electrolysis	• Explain the process of electrolysis, including the movement of ions and discharge of elements at the electrodes. Compare the electrolysis of molten and aqueous solutions. Describe industrial applications such as aluminium extraction and electroplating.	
	• Define nanoparticles and explain why they have different properties from bulk materials. Discuss applications in medicine, electronics, and catalysts. Evaluate risks and benefits.	
	• Using electrolysis to extract metals - explain why a mixture is used as the electrolyte, explain why the positive electrode must be continually replaced.	
	• Electrolysis of aqueous solutions - predict the products of the electrolysis of aqueous solutions containing a single ionic compound	
	• Required Practical 3: electrolysing aqueous solutions using inert electrodes and developing a hypothesis	
	• Represent the reactions at electrodes as half equations	

Triple Science, Foundation Tier

C4 Chemical Changes

Revision Checklist

Topic	Content	✓
Reactivity of Metals	• Define the reactivity series and explain how it determines metal reactions with acids, water, and displacement reactions. Compare reactivity trends.	
	• Extraction of Metals – Describe reduction with carbon and electrolysis. Explain why some metals (e.g., aluminium) must be extracted using electrolysis. Discuss how the position of a metal in the reactivity series affects its extraction and applications in industry.	
	• Oxidation and reduction in terms of electrons - write ionic equations for displacement reactions and identify which species are oxidised and which are reduced in a given reaction, symbol equation or half equation.	
Reactions of Acids	• Define acids, bases, and alkalis in terms of proton donation and hydroxide ions. Explain the pH scale and how indicators such as universal indicator and litmus paper are used. Compare strong and weak acids in terms of ionisation.	
	• Neutralisation and Making Salts -Describe the process of making salts from acids and bases, including the role of different bases (oxides, hydroxides, and carbonates). Explain how salts are purified through crystallisation. Discuss the uses of salts in industry and medicine.	
	• Soluble salts - describe how to make pure, dry samples of named soluble salts from information provided.	
	• Required Practical 1: preparation of a pure, dry sample of a soluble salt.	
	• pH scale and neutralisation - describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution, use the pH scale to identify acidic or alkaline solutions.	

Triple Science, Foundation Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Reactions of Acids	• Titrations - describe how to carry out titrations using strong acids and strong alkalis only (sulfuric, hydrochloric and nitric acids only) to find the reacting volumes accurately, calculate the chemical quantities in titrations involving concentrations in mol/dm3 and in g/dm3.	
	• Required Practical 2: determination of reacting volumes by titration.	
	• Strong and weak acids - use and explain the terms dilute and concentrated (in terms of amount of substance), and weak and strong (in terms of the degree of ionisation) in relation to acids, describe neutrality and relative acidity in terms of the effect on hydrogen ion concentration and the numerical value of pH.	
Electrolysis	• Explain the process of electrolysis, including the movement of ions and discharge of elements at the electrodes. Compare the electrolysis of molten and aqueous solutions. Describe industrial applications such as aluminium extraction and electroplating.	
	• Define nanoparticles and explain why they have different properties from bulk materials. Discuss applications in medicine, electronics, and catalysts. Evaluate risks and benefits.	
	• Using electrolysis to extract metals - explain why a mixture is used as the electrolyte, explain why the positive electrode must be continually replaced.	
	• Electrolysis of aqueous solutions - predict the products of the electrolysis of aqueous solutions containing a single ionic compound	
	• Required Practical 3: electrolysing aqueous solutions using inert electrodes and developing a hypothesis	

Double Science, Higher Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Reactivity of Metals	• Define the reactivity series and explain how it determines metal reactions with acids, water, and displacement reactions. Compare reactivity trends.	
	• Extraction of Metals – Describe reduction with carbon and electrolysis. Explain why some metals (e.g., aluminium) must be extracted using electrolysis. Discuss how the position of a metal in the reactivity series affects its extraction and applications in industry.	
	• Oxidation and reduction in terms of electrons - write ionic equations for displacement reactions and identify which species are oxidised and which are reduced in a given reaction, symbol equation or half equation.	
Reactions of Acids	• Define acids, bases, and alkalis in terms of proton donation and hydroxide ions. Explain the pH scale and how indicators such as universal indicator and litmus paper are used. Compare strong and weak acids in terms of ionisation.	
	• Neutralisation and Making Salts -Describe the process of making salts from acids and bases, including the role of different bases (oxides, hydroxides, and carbonates). Explain how salts are purified through crystallisation. Discuss the uses of salts in industry and medicine.	
	• Soluble salts - describe how to make pure, dry samples of named soluble salts from information provided.	
	• Required Practical 1: preparation of a pure, dry sample of a soluble salt.	
	• pH scale and neutralisation - describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution, use the pH scale to identify acidic or alkaline solutions.	

Double Science, Higher Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Electrolysis	• Explain the process of electrolysis, including the movement of ions and discharge of elements at the electrodes. Compare the electrolysis of molten and aqueous solutions. Describe industrial applications such as aluminium extraction and electroplating.	
	• Define nanoparticles and explain why they have different properties from bulk materials. Discuss applications in medicine, electronics, and catalysts. Evaluate risks and benefits.	
	• Using electrolysis to extract metals - explain why a mixture is used as the electrolyte, explain why the positive electrode must be continually replaced.	
	• Electrolysis of aqueous solutions - predict the products of the electrolysis of aqueous solutions containing a single ionic compound	
	• Required Practical 2: electrolysing aqueous solutions using inert electrodes and developing a hypothesis	
	• Represent the reactions at electrodes as half equations	

Double Science, Foundation Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Reactivity of Metals	• Define the reactivity series and explain how it determines metal reactions with acids, water, and displacement reactions. Compare reactivity trends.	
	• Extraction of Metals – Describe reduction with carbon and electrolysis. Explain why some metals (e.g., aluminium) must be extracted using electrolysis. Discuss how the position of a metal in the reactivity series affects its extraction and applications in industry.	
	• Oxidation and reduction in terms of electrons - write ionic equations for displacement reactions and identify which species are oxidised and which are reduced in a given reaction, symbol equation or half equation.	
Reactions of Acids	• Define acids, bases, and alkalis in terms of proton donation and hydroxide ions. Explain the pH scale and how indicators such as universal indicator and litmus paper are used. Compare strong and weak acids in terms of ionisation.	
	• Neutralisation and Making Salts -Describe the process of making salts from acids and bases, including the role of different bases (oxides, hydroxides, and carbonates). Explain how salts are purified through crystallisation. Discuss the uses of salts in industry and medicine.	
	• Soluble salts - describe how to make pure, dry samples of named soluble salts from information provided.	
	• Required Practical 1: preparation of a pure, dry sample of a soluble salt.	
	• pH scale and neutralisation - describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution, use the pH scale to identify acidic or alkaline solutions.	

Double Science, Foundation Tier

C4 Chemical Changes Revision Checklist

Topic	Content	✓
Electrolysis	• Explain the process of electrolysis, including the movement of ions and discharge of elements at the electrodes. Compare the electrolysis of molten and aqueous solutions. Describe industrial applications such as aluminium extraction and electroplating.	
	• Define nanoparticles and explain why they have different properties from bulk materials. Discuss applications in medicine, electronics, and catalysts. Evaluate risks and benefits.	
	• Using electrolysis to extract metals - explain why a mixture is used as the electrolyte, explain why the positive electrode must be continually replaced.	
	• Electrolysis of aqueous solutions - predict the products of the electrolysis of aqueous solutions containing a single ionic compound	
	• Required Practical 2: electrolysing aqueous solutions using inert electrodes and developing a hypothesis	