

Wah Yan College Kowloon
F.5 Chemistry Scheme of Work (2016-2017)

Textbook	<ol style="list-style-type: none"> 1. New 21st Century Chemistry 2C Topic 6 Microscopic World II (Compulsory Part) (2nd Edition) (WY) 2. New 21st Century Chemistry 3A Topic 7 Fossil Fuels and Carbon Compounds (Compulsory Part) (2nd Edition) (WY) 3. New 21st Century Chemistry 3B Topic 8 Chemistry of Carbon Compounds (Compulsory Part) (2nd Edition) (WY) 4. New 21st Century Chemistry 3C Topic 9 Chemical Reactions and Energy (Compulsory Part) (2nd Edition) (WY) 5. New 21st Century Chemistry 4A Topic 10 Rate of Reaction (Compulsory Part) (2nd Edition) (WY) 6. New 21st Century Chemistry 4B Topic 11 Chemical Equilibrium (Compulsory Part) (2nd Edition) (WY)
Other Resources	

SL: Scheduled number of lessons

AL: Actual number of lessons

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
First Term (1/9/2014- 2/1/2015, Weeks 1 to 18)		Topic 6 Microscopic World II - Bond polarity and intermolecular forces					
	Week 1	24.1 Electron sharing in a covalent bond	<ul style="list-style-type: none"> • Polar covalent bond • Uneven distribution of bonding electrons in a HCl molecule 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		7,10
	Week 1	24.2 Electronegativity	<ul style="list-style-type: none"> • What electronegativity is • Electronegativity of some common elements 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Checkpoint 	7
	Week 1	24.3 How polar bonds and shape affect the polarity of a molecule	<ul style="list-style-type: none"> • Dipole moment • Polar molecules <ul style="list-style-type: none"> – H₂O – NH₃ – CHCl₃ 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Animations 		7,10

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			<ul style="list-style-type: none"> • Non-polar molecules – CO₂ – BF₃ – CCl₄ 				
	Week 1	24.4 Effect of a charged rod on polar and non-polar liquids	<ul style="list-style-type: none"> • Using a charged rod to test whether molecules of a liquid are polar 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Activity 24.1 — Testing liquids to find out if their molecules are polar 	<ul style="list-style-type: none"> • Checkpoint 	7
	Week 1	24.5 Intermolecular forces	<ul style="list-style-type: none"> • Permanent dipole permanent dipole attractions • Instantaneous Dipole induced dipole attractions • Van der Waals' forces 	SL	<ul style="list-style-type: none"> • PowerPoint • Animations 	<ul style="list-style-type: none"> • Checkpoint 	7,10
	Week 1	24.6 Factors affecting the strength of van der Waals' forces	<ul style="list-style-type: none"> • Number of electrons in the atom or molecule • Shape of the molecule 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Animations 	<ul style="list-style-type: none"> • Checkpoint 	7,10
	Week 2	24.7 Hydrogen bonding	<ul style="list-style-type: none"> • Special features of hydrogen bonding • Hydrogen bonding in <ul style="list-style-type: none"> – liquid hydrogen fluoride 	SL	<ul style="list-style-type: none"> • PowerPoint • Animations 	<ul style="list-style-type: none"> • Checkpoint 	2,7,10

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			<ul style="list-style-type: none"> – water – liquid ammonia – methanol 				
	Week 2	24.8 The density of water and ice	<ul style="list-style-type: none"> • The open structure of ice due to hydrogen bonding • Explaining why ice is less dense than water in terms of the structure of ice 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10
	Week 2	24.9 Surface tension and viscosity of liquids	<ul style="list-style-type: none"> • Explaining the high surface tension of water in terms of hydrogen bonding • Factors affecting the viscosity of a liquid 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Activity 24.2 — Investigating the surface tension and viscosity of water 		2,7,10
	Week 2	24.10 Intermolecular attractions in Alcohols	<ul style="list-style-type: none"> • Comparing the boiling points of ethanol, methoxymethane and propane • Comparing the water solubility of ethanol, methoxymethane and propane • Comparing the viscosity of different alcohols 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Activity 24.3 — Comparing the viscosity of alcohols with different numbers of hydroxyl groups 	• Checkpoint	7,10

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	Week 2	24.11 Intermolecular attractions and properties of liquids	<ul style="list-style-type: none"> The evaporation rate of liquids with different strength of intermolecular attractions 	SL	<ul style="list-style-type: none"> PowerPoint Animations Activity 24.4 — Investigating the temperature changes caused by the evaporation of liquids with different strength of intermolecular attractions Concept mapping 	<ul style="list-style-type: none"> Unit exercise Topic exercise Topic quiz 	7,10
		Topic 7 Fossil fuels					
	Week 3	25.1 Fossil fuels — A major energy source	<ul style="list-style-type: none"> Formation of coal Formation of petroleum and natural gas 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		2,10,18
	Week 3	25.2 Importance of petroleum	<ul style="list-style-type: none"> Main uses of refined petroleum Economic importance of petroleum 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		2,10,18
	Week 3	25.3 Hydrocarbons	<ul style="list-style-type: none"> Definition Types of hydrocarbons 	SL	<ul style="list-style-type: none"> PowerPoint 		2,10
	Week 3	25.4 What does petroleum contain?	<ul style="list-style-type: none"> Hydrocarbons in petroleum <ul style="list-style-type: none"> – alkanes – cycloalkanes 	SL	<ul style="list-style-type: none"> PowerPoint 		2,10

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			– aromatic hydrocarbons				
	Week 3	25.5 Fractional distillation of petroleum	<ul style="list-style-type: none"> • How fractional distillation of petroleum is carried out in an oil refinery • Fractional distillation of crude oil in the laboratory • Properties of fractions of petroleum with different boiling point ranges 	SL	<ul style="list-style-type: none"> • Activity 25.1 — Fractional distillation of crude oil and studying the properties of its fractions • PowerPoint • Discussion • 3D animations 		2,10,18
	Week 3	25.6 Major uses of fractions of petroleum	<ul style="list-style-type: none"> • Major uses of fractions of petroleum 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	<ul style="list-style-type: none"> • Practice 25.1 	7,10,18
	Week 4	25.7 Combustion of hydrocarbons	<ul style="list-style-type: none"> • Exothermic and endothermic reactions 	SL	<ul style="list-style-type: none"> • PowerPoint 		2,10
	Week 4	25.8 Carbon dioxide and the greenhouse effect	<ul style="list-style-type: none"> • What the greenhouse effect is • How carbon dioxide causes the greenhouse effect 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	<ul style="list-style-type: none"> • Practice 25.2 	7,10,18
	Week 4	25.9 Major air pollutants from cars, factories, incinerators and power plants	<ul style="list-style-type: none"> • Carbon monoxide • Unburnt hydrocarbons • Suspended particulates • Oxides of nitrogen 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Animations 		2,10,18

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			<ul style="list-style-type: none"> • Sulphur dioxide • Effects of the air pollutants to the environment and human health 				
	Week 4	25.10 Measures for reducing emission of air pollutants	<ul style="list-style-type: none"> • Air pollution in Hong Kong • Using catalytic converters in exhaust systems of motor vehicles 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Animations 	• Practice 25.3	7,10,18
	Week 4	25.11 Impact of using fossil fuels on our quality of life and the environment	<ul style="list-style-type: none"> • How modern people use fossil fuels • Impact of using fossil fuels on the environment 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Animations • Concept mapping 	• Unit exercise	2,7,18
		Unit 26 Homologous series, structural formulae and naming of carbon compounds					2,10
	Week 5	26.1 A look at molecules of compounds in petroleum	<ul style="list-style-type: none"> • Boiling points of hydrocarbons in petroleum 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10
	Week 5	26.2 Chemistry of carbon compounds	<ul style="list-style-type: none"> • Unique features of carbon 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10
	Week 5	26.3 Representing molecules of	<ul style="list-style-type: none"> • Structural formulae • Condensed structural 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	• Practice 26.1	2,7,10

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		carbon compounds	formulae • Skeletal formulae				
	Week 5	26.4 Molecular models	• Ball-and-stick models • Space-filling models	SL	• PowerPoint • Animations		2,10
	Week 5	26.5 Functional groups	• What a functional group is	SL	• PowerPoint • Discussion		2,10
	Week 5	26.6 Homologous series	• What a homologous series is • Characteristics of members in a homologous series • Some homologous series and the functional groups they contain	SL	• Activity 26.1 — Building molecular models of alkanols and alkanolic acids • PowerPoint • Discussion		2,10
	Week 6	26.7 The alkanes	• General formula of members of the alkane series • Six simple straight-chain alkanes	SL	• Activity 26.2 — Building molecular models of alkanes • PowerPoint		2,10
	Week 6	26.8 Naming straight chain and branched chain alkanes	• Naming – straight-chain alkanes – branched-chain alkanes – cycloalkanes	SL	• PowerPoint	• Practice 26.2	2,7,10
	Week 6	26.9 Naming alkenes	• Naming alkenes with carbon chains	SL	• Activity 26.3 — Building molecular models of	• Practice 26.3	2,7,10

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			containing up to 6 carbon atoms		alkenes • PowerPoint		
	Week 6	26.10 Naming alkanols	• Naming alkanols with carbon chains containing up to 6 carbon atoms	SL	• PowerPoint		2,10
	Week 6	26.11 Naming alkanolic acids	• Naming alkanolic acids with carbon chains containing up to 6 carbon atoms	SL	• PowerPoint	• Practice 26.4	2,7,10
	Week 6	26.12 Physical properties of alkanes	• Rise of melting and boiling points of alkanes with the increase of the number of carbon atoms in the alkane molecules • Solubility and density of alkanes	SL	• PowerPoint • Discussion • Concept mapping	• Unit exercise	2,7,10
		Unit 27 Alkanes and alkenes					
	Week 7	27.1 Risks and benefits of fossil fuels to the society and environment	• Benefits of using fossil fuels • Risks of using fossil fuels • Spillage of petroleum	SL	• PowerPoint • Discussion		2,10,18
	Week 7	27.2 Important reactions of alkanes	• Combustion • Reaction with halogens	SL	• Activity 27.1 — Investigating the	• Practice 27.1	2,7,10

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			<ul style="list-style-type: none"> — substitution reactions • Steps involved in the substitution of methane with chlorine 		<ul style="list-style-type: none"> properties of an alkane • PowerPoint • Discussion 		
	Week 7	27.3 Demand for various fractions of Petroleum	<ul style="list-style-type: none"> • Percentages of various fractions obtained from the fractional distillation of petroleum from different parts of the world • The supply and demand for various fractions 	SL	<ul style="list-style-type: none"> • PowerPoint 		2,10,18
	Week 8	27.4 Cracking	<ul style="list-style-type: none"> • Catalytic cracking • Cracking of tetradecane as an example • Importance of cracking <ul style="list-style-type: none"> – Producing extra petrol – As a source of alkenes • Cracking of medicinal paraffin in the laboratory 	SL	<ul style="list-style-type: none"> • Activity 27.2 — Cracking of medicinal paraffin and testing the gaseous product • PowerPoint • Discussion 	<ul style="list-style-type: none"> • Practice 27.2 	7,10,18
	Week 8	27.5 The alkenes	<ul style="list-style-type: none"> • Some straight-chain alkenes 	SL	<ul style="list-style-type: none"> • PowerPoint 		2,10
	Week 8	27.6 Physical properties of alkenes	<ul style="list-style-type: none"> • Rise of melting and boiling points of alkenes with the increase of the length 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10

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			of carbon chain in the alkene molecules • Solubility of alkenes in water				
	Week 8	27.7 Important reactions of alkenes	• What an addition reaction is • Reaction with bromine solution • Reaction with cold acidified dilute potassium permanganate solution • Test for unsaturation	SL	• Activity 27.3 — Investigating the properties of an alkene • Activity 27.4 — Distinguishing between an alkane and an alkene • PowerPoint	• Practice 27.3	2,7,10
	Week 8	27.8 Wind power — an alternative source of energy	• Wind energy being a renewable energy source • Limitations of using wind energy	SL	• Concept mapping	• Unit exercise	2,7,18
		Unit 28 Addition polymers					
	Week 9	28.1 Plastic items in modern homes	• Various uses of plastics in modern homes	SL	• PowerPoint • Discussion		2,10,18
	Week 9	28.2 Why are plastics so useful?	• General properties of plastics	SL	• PowerPoint • Discussion		2,10,18
	Week 9	28.3 What is a polymer?	• What a polymer is • Polymerization • Natural and man-made polymers	SL	• PowerPoint		2,10
	Week 9	28.4	• Polymerization of	SL	• PowerPoint	• Practice 28.1	2,7,10

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		Polymerization of ethene	ethene <ul style="list-style-type: none"> • What addition polymerization is • What addition polymers are • What a repeating unit is • Polythene being an addition polymer • Low density polythene and high density polythene 				
	Week 10	28.5 Some common addition polymers	<ul style="list-style-type: none"> • Polypropene (PP) • Polyvinyl chloride (PVC) • Polystyrene (PS) • Perspex 	SL	<ul style="list-style-type: none"> • Activity 28.1 — Investigating the properties of some polymers • Activity 28.2 — Preparing polystyrene • PowerPoint 	• Practice 28.2	2,7,10
	Week 10	28.6 Uses of some common addition polymers	<ul style="list-style-type: none"> • Uses and properties of some common addition polymers <ul style="list-style-type: none"> – low density polythene – high density polythene – polypropene – polyvinyl chloride 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion • Concept mapping 	<ul style="list-style-type: none"> • Practice 28.3 • Unit exercise 	7,10,18

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			<ul style="list-style-type: none"> – polystyrene – Perspex 				
		Unit 29 Naming and physical properties of carbon compounds					
	Week 11	29.1 Functional groups: centre of reactivity	<ul style="list-style-type: none"> • What a functional group is • Functional groups which members of some homologous series contain 	SL	<ul style="list-style-type: none"> • Activity 29.1 — Building molecular models of compounds in different homologous series • PowerPoint 	• Practice 29.1	7,10
	Week 11	29.2 Naming alkanes and alkenes	<ul style="list-style-type: none"> • Revising the naming of alkanes and alkenes learnt in Topic 7 	SL	<ul style="list-style-type: none"> • PowerPoint 	• Practice 29.2	7,10
	Week 11	29.3 IUPAC rules of naming carbon compounds	<ul style="list-style-type: none"> • The IUPAC rules of naming • Names of parent chains • Numerical prefixes • Names of substituents 	SL	<ul style="list-style-type: none"> • PowerPoint 		10
	Week 11	29.4 Naming haloalkanes	<ul style="list-style-type: none"> • Naming haloalkanes containing the halogeno functional group: <ul style="list-style-type: none"> – F – Cl – Br – I 	SL	<ul style="list-style-type: none"> • PowerPoint 	• Practice 29.3	7,10

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	Week 11	29.5 Naming alcohols	<ul style="list-style-type: none"> Naming alcohols with the general formula $C_nH_{2n+1}OH$ Naming polyhydric alcohols 	SL	• PowerPoint	• Practice 29.4	7,10
	Week 11	29.6 Naming aldehydes and ketones	<ul style="list-style-type: none"> Naming aldehydes (general formula $RCHO$ where R is an alkyl or aryl group or hydrogen) Naming ketones (general formula $RCOR_1$, where R and R_1 are alkyl or aryl groups) 	SL	• PowerPoint	• Practice 29.5	7,10
	Week 11	29.7 Naming carboxylic acids	<ul style="list-style-type: none"> Naming carboxylic acids (general formula $RCOOH$ where R is an alkyl or aryl group or hydrogen) 	SL	• PowerPoint	• Practice 29.6	7,10
	Week 11	29.8 Naming esters	<ul style="list-style-type: none"> Naming an ester based on the alcohol and carboxylic acid from which the ester is derived 	SL	• PowerPoint	• Practice 29.7	7,10
	Week 11	29.9 Naming amides	<ul style="list-style-type: none"> Naming amides with an unsubstituted $-NH_2$ group 	SL	• PowerPoint		10

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	Week 11	29.10 Naming amines	<ul style="list-style-type: none"> Naming primary amines 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Practice 29.8 	7,10
	Week 12	29.11 Intermolecular forces and physical properties of carbon compounds	<ul style="list-style-type: none"> Strength of intermolecular forces in a carbon compound depends on <ul style="list-style-type: none"> the functional group it contains the length of its carbon chain 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 12	29.12 Physical properties of haloalkanes	<ul style="list-style-type: none"> Boiling point Solubility in water 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 12	29.13 Physical properties of alcohols	<ul style="list-style-type: none"> Boiling point Solubility in water 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 12	29.14 Physical properties of aldehydes and ketones	<ul style="list-style-type: none"> Boiling point Solubility in water 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 12	29.15 Physical properties of carboxylic acids	<ul style="list-style-type: none"> Boiling point Solubility in water 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 12	29.16 Physical properties of esters	<ul style="list-style-type: none"> Boiling point Solubility in water 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 12	29.17 Physical properties of amides	<ul style="list-style-type: none"> Boiling point Solubility in water 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
		29.18	<ul style="list-style-type: none"> Boiling point 	SL	<ul style="list-style-type: none"> PowerPoint 		10

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		Physical properties of amines	<ul style="list-style-type: none"> Solubility in water 		<ul style="list-style-type: none"> Discussion 		
	Week 12	29.19 Common names of carbon compounds	<ul style="list-style-type: none"> Common names or trivial names of some carbon compounds 	SL	<ul style="list-style-type: none"> PowerPoint Concept mapping 	<ul style="list-style-type: none"> Unit exercise 	7,10
		Unit 30 Isomerism					
	Week 13	30.1 Isomerism	<ul style="list-style-type: none"> Structural isomerism Stereoisomerism 	SL	<ul style="list-style-type: none"> PowerPoint 		10
	Week 13	30.2 Structural isomerism	<ul style="list-style-type: none"> Chain isomerism Position isomerism Functional group isomerism 	SL	<ul style="list-style-type: none"> Activity 30.1 — Building molecular models of structural isomers PowerPoint Discussion 	<ul style="list-style-type: none"> Practice 30.1 	7,10
	Week 13	30.3 <i>Cis-trans</i> isomerism	<ul style="list-style-type: none"> <i>Cis-trans</i> isomerism exhibited by compounds containing a C=C bond Explaining the difference in melting point / boiling point /water solubility of two <i>cis-trans</i> isomers 	SL	<ul style="list-style-type: none"> Activity 30.2 — Building molecular models of <i>cis-trans</i> isomers PowerPoint Discussion 	<ul style="list-style-type: none"> Practice 30.2 	7,10
	Week 13	30.4 Chirality	<ul style="list-style-type: none"> What a chiral object is 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 13	30.5 Enantiomers	<ul style="list-style-type: none"> What enantiomers are Characteristic of a simple chiral molecule Looking at the chiral molecule of CHFCIBr 	SL	<ul style="list-style-type: none"> PowerPoint Discussion Animation 		10

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			and lactic acid • Identifying chiral carbons in chiral compounds				
	Week 13	30.6 Test for chirality — plane of symmetry	• Determining whether a molecule has a plane of symmetry	SL	• Activity 30.3 — Building models of some molecules and determining whether the molecules are chiral • PowerPoint	• Practice 30.3	7,10
	Week 13	30.7 Distinguishing the enantiomers of a chiral compound	• How enantiomers of a chiral compound perturb plane-polarized light • Polarimeter for measurement of rotation of plane polarised light	SL	• PowerPoint • Discussion • Animation • Concept mapping	• Practice 30.4 • Unit exercise	7,10
	Week 14	Revision week					
	Week 15	Mid-Year Examination					
Second Term (3/1/2015-16/7/2015, Weeks 19 to 46)		Unit 31 Typical reactions of selected functional groups					
	Week 19	31.1 Introduction	• Importance of planning synthetic routes for the synthesis of new	SL	• PowerPoint • Discussion		10

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			molecules from readily available molecules				
	Week 19	31.2 Important reactions of alkanes	<ul style="list-style-type: none"> • Combustion • Reaction with halogens — substitution reactions 	SL	<ul style="list-style-type: none"> • PowerPoint 		10
	Week 19	31.3 Addition reactions of alkenes	<ul style="list-style-type: none"> • Addition of hydrogen to alkenes in the presence of catalysts • Addition of halogens to alkenes and test for unsaturation with aqueous bromine • Addition of hydrogen halides to alkenes and using Markovnikov's rule to predict the major product 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	<ul style="list-style-type: none"> • Practice 31.1 	7,10
	Week 20	31.4 Substitution reactions of haloalkanes	<ul style="list-style-type: none"> • Hydrolysis of haloalkanes to form alcohols 	SL	<ul style="list-style-type: none"> • PowerPoint 		10
	Week 20	31.5 Reactions of alcohols	<ul style="list-style-type: none"> • Primary, secondary and tertiary alcohols • Substitution reactions of alcohols with halides • Elimination reactions — dehydration of alcohols 	SL	<ul style="list-style-type: none"> • Activity 31.1 — Studying the properties of alcohols • Activity 31.2 — Oxidizing ethanol to ethanoic acid and 	<ul style="list-style-type: none"> • Practice 31.2 • Practice 31.3 • Practice 31.4 • Practice 31.5 	7,10

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			to form alkenes • Oxidation of alcohols		testing the ethanoic acid produced • PowerPoint		
	Week 21	31.6 Reactions of aldehydes and ketones	• Oxidation of aldehydes and ketones • Reduction of aldehydes and ketones	SL	• Activity 31.3 — Studying the properties of propanal and propanone • PowerPoint	• Practice 31.6	7,10
	Week 21	31.7 Reactions of carboxylic acids	• Reaction with alkalis and hydrogencarbonates • Esterification / Condensation reaction • Reduction • Amides from carboxylic acids	SL	• Activity 31.4 — Studying the reaction between ethanol and ethanoic acid • Activity 31.5 — Identifying unknown carbon compounds • PowerPoint	• Practice 31.7	7,10
	Week 22	31.8 Hydrolysis of esters	• Hydrolysis of esters in aqueous acid / alkali • Obtaining the products after the hydrolysis of an ester in alkaline solution	SL	• PowerPoint		10
	Week 22	31.9 Hydrolysis of amides	• Hydrolysis of amides in aqueous acid / alkali	SL	• PowerPoint • Concept mapping	• Practice 31.8 • Unit exercise	7,10
		Unit 32 Synthesis of carbon					

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		compounds					
	Week 23	32.1 Planning a synthesis	<ul style="list-style-type: none"> • Deploying suitable reactions and functional group interconversions to alter the groups attached to a basic carbon skeleton • Percentage yield of a product • Choosing the reagents 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	• Practice 32.1	7,10
	Week 23	32.2 Two-step synthetic routes	<ul style="list-style-type: none"> • Working backwards from the target molecule until a suitable starting material can be found • Simple two-step synthetic routes 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	• Practice 32.2	7,10
	Week 24	32.3 More complicated synthetic routes	<ul style="list-style-type: none"> • Synthetic routes with three or more steps 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	• Practice 32.3	7,10
	Week 24	32.4 Laboratory preparation of simple carbon compounds	<ul style="list-style-type: none"> • Planning • Carrying out the reaction to obtain crude product • Separating the crude product from the reaction mixture • Purifying and drying the 	SL	<ul style="list-style-type: none"> • PowerPoint 		10

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			product • Measuring the percentage yield of the product				
	Week 25-26	Lunar New Year Holiday					
	Week 27	32.5 Common separation and purification methods in carbon compound preparation	<ul style="list-style-type: none"> • Common separation and purification methods for liquid products <ul style="list-style-type: none"> – distillation – fractional distillation – liquid-liquid extraction • Common separation and purification method for solid products <ul style="list-style-type: none"> – re-crystallization 	SL	• PowerPoint		10
	Week 27	32.6 Preparing 1- bromobutane in the laboratory	<ul style="list-style-type: none"> • Reaction of butan-1-ol with a mixture of sodium bromide and concentrated sulphuric acid • Separating the crude product from the reaction mixture • Purifying and drying the product • Calculating the percentage 	SL	<ul style="list-style-type: none"> • Activity 32.1 — Preparing and purifying 2-chloro-2-methylpropane • PowerPoint • Concept mapping 	<ul style="list-style-type: none"> • Practice 32.4 • Unit exercise 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			yield of the product				
		Unit 33 Important organic substances					
	Week 27	33.1 Introduction	<ul style="list-style-type: none"> Raising the awareness of the importance of organic substances in daily life 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		2,10
	Week 27	33.2 Aspirin — a common painkiller	<ul style="list-style-type: none"> Functional groups acetylsalicylic acid contains Uses and problems of aspirin tablets 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		2,10
	Week 27	33.3 Detergents	<ul style="list-style-type: none"> Detergents can decrease surface tension of water Soapy detergents Soapless detergents 	SL	<ul style="list-style-type: none"> PowerPoint 		2,10
	Week 27	33.4 How do detergents help water to clean?	<ul style="list-style-type: none"> Structure of a typical anionic detergent 	SL	<ul style="list-style-type: none"> Activity 33.1 — Investigating the properties of detergents PowerPoint 		10
	Week 28	33.5 The wetting and emulsifying properties of detergents in relation to their structures	<ul style="list-style-type: none"> The wetting property of detergents The emulsifying property of detergents 	SL	<ul style="list-style-type: none"> PowerPoint Animation 		10
	Week 28	33.6	<ul style="list-style-type: none"> How does a detergent 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Practice 33.1 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
		The cleaning action of detergents	help to clean				
	Week 28	33.7 Making soaps and soapless detergents	<ul style="list-style-type: none"> • Making soaps from fats or oils in school laboratory • Manufacture of soapless detergents from hydrocarbons obtained from petroleum 	SL	<ul style="list-style-type: none"> • Activity 33.2 — Preparing a soap and testing its properties • PowerPoint 		10,18
	Week 28	33.8 Fats and oils	<ul style="list-style-type: none"> • Structure of triglyceride, glycerol, fatty acid and its salt and equation for saponification 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Practice 33.2 	7,10
	Week 28	33.9 Polyesters	<ul style="list-style-type: none"> • Monomers for producing polyesters • Condensation polymerization • Uses of poly(ethylene terephthalate) 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Practice 33.3 	7,10,18
	Week 28	33.10 Nylons	<ul style="list-style-type: none"> • Monomers for producing nylons • Condensation polymerization • Uses of nylons 	SL	<ul style="list-style-type: none"> • Activity 33.3 — Preparing nylon • PowerPoint • Concept mapping 	<ul style="list-style-type: none"> • Practice 33.4 • Unit exercise • Topic exercise 	7,10
	Week 29	Revision Week					
	Week 30	Uniform Test					

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
	Week 31 & 32	Easter Holiday					
		Topic 9 Chemical Reactions and Energy					
		Unit 34 Energy changes in chemical reactions					
	Week 33	34.1 What is energy?	<ul style="list-style-type: none"> • Different forms of energy • Unit of energy 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10
	Week 33	34.2 Specific heat capacity	<ul style="list-style-type: none"> • Calculations involving specific heat capacity and heat capacity 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Practice 34.1 	7,10
	Week 33	34.3 The system and the surroundings	<ul style="list-style-type: none"> • Law of conservation of energy 	SL	<ul style="list-style-type: none"> • PowerPoint 		2,10
	Week 33	34.4 Internal energy of a system	<ul style="list-style-type: none"> • Introducing the term 'enthalpy change' • Difference between enthalpy change and internal energy change is usually small in most cases 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10
	Week 33	34.5 Enthalpy change of an	<ul style="list-style-type: none"> • What an exothermic reaction is 	SL	<ul style="list-style-type: none"> • Activity 34.1 — Classifying whether 		10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
		exothermic reaction	<ul style="list-style-type: none"> Enthalpy level diagram of an exothermic reaction 		reactions are exothermic or endothermic <ul style="list-style-type: none"> PowerPoint 		
	Week 33	34.6 Enthalpy change of an endothermic reaction	<ul style="list-style-type: none"> What an endothermic reaction is Enthalpy level diagram of an endothermic reaction 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Practice 34.2 	7,10
	Week 33	34.7 Enthalpy changes during physical and chemical changes	<ul style="list-style-type: none"> Enthalpy change during the melting of ice Enthalpy change during the combustion of methane 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 	<ul style="list-style-type: none"> Practice 34.3 	2,7,10
	Week 33	34.8 Thermochemical equations	<ul style="list-style-type: none"> Writing and interpreting Thermochemical equations 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Practice 34.4 	7,10
	Week 33	34.9 Explaining energy changes — breakage and formation of chemical bonds	<ul style="list-style-type: none"> Exothermic reaction — the amount of energy released in the bond-forming step is greater than the amount of energy used in the bond-breaking step Endothermic reaction — the amount of energy released in the 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 	<ul style="list-style-type: none"> Practice 34.5 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
			bond-forming step is less than the amount of energy used in the bond-breaking step				
	Week 33	34.10 Standard conditions for measuring enthalpy changes	<ul style="list-style-type: none"> • What the standard conditions are 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Practice 34.6 	7,10
	Week 34	34.11 Standard enthalpy change of reaction	<ul style="list-style-type: none"> • Definition of standard enthalpy change of reaction 	SL	<ul style="list-style-type: none"> • PowerPoint 		10
	Week 34	34.12 Standard enthalpy change of formation	<ul style="list-style-type: none"> • Definition of standard enthalpy change of formation • Enthalpy level diagram representing standard enthalpy change of formation • Standard enthalpy changes of formation of some common substances • Making use of enthalpy change of formation to compare the stability of a compound and its constituent elements 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
	Week 34	34.13 Standard enthalpy change of combustion	<ul style="list-style-type: none"> • Definition of standard enthalpy change of combustion • Enthalpy level diagram representing standard enthalpy change of combustion • Standard enthalpy changes of combustion of some common substances 	SL	• PowerPoint	• Practice 34.7	7,10
	Week 34	34.14 Standard enthalpy change of neutralization	<ul style="list-style-type: none"> • Definition of standard enthalpy change of neutralization • Standard enthalpy change of neutralization involving a strong acid and a strong alkali • Standard enthalpy change of neutralization involving either a weak acid or a weak alkali or both 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		10
	Week 34	34.15 Determining enthalpy changes of chemical reactions	• Experiment and calculation for determining the enthalpy	SL	• Activity 34.2 — Determining the enthalpy change of a	• Practice 34.8	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
			change of neutralization between hydrochloric acid and sodium hydroxide solution <ul style="list-style-type: none"> • Sources of inaccuracy in the experiment • Determining the heat capacity of the polystyrene calorimeter 		reaction <ul style="list-style-type: none"> • Activity 34.3 — Determining the enthalpy changes of neutralization • PowerPoint • Discussion 		
	Week 34	34.16 Determining enthalpy changes of combustion	<ul style="list-style-type: none"> • Determining the enthalpy change of combustion of ethanol 	SL	<ul style="list-style-type: none"> • Activity 34.4 — Determining the enthalpy changes of combustion of some alcohols • PowerPoint • Concept mapping 	<ul style="list-style-type: none"> • Practice 34.9 • Unit exercise 	7,10
		Unit 35 Hess's Law and its applications					
	Week 35	35.1 Hess's Law	<ul style="list-style-type: none"> • Definition of Hess's Law • Introducing Hess's Law via the oxidation of nitrogen to nitrogen dioxide • Enthalpy change cycle relating the enthalpy 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	<ul style="list-style-type: none"> • Practice 35.1 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
			changes of processes involved in the reaction between gaseous nitrogen and oxygen to form nitrogen dioxide gas				
	Week 35	35.2 Using Hess's Law to determine enthalpy changes that cannot be easily obtained by experiment	<ul style="list-style-type: none"> Applying Hess's Law and making use of the enthalpy changes of Haber process (making ammonia through the reaction between nitrogen and hydrogen) and the formation of ammonia through the reaction between hydrazine and hydrogen, determine the enthalpy change of formation of hydrazine Enthalpy change cycle used for determining ΔH 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 	• Practice 35.2	7,10
	Week 35	35.3 Determining the enthalpy change of formation of magnesium hydroxide from	<ul style="list-style-type: none"> Determining the enthalpy change of the reaction between magnesium and hydrochloric acid 	SL	• Activity 35.1 — Determining the enthalpy change of formation of	• Practice 35.3	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
		enthalpy changes of other reactions	<ul style="list-style-type: none"> • Determining the enthalpy change of the reaction between magnesium hydroxide and hydrochloric acid • Calculating the enthalpy change of formation of magnesium hydroxide 		magnesium oxide <ul style="list-style-type: none"> • Activity 35.2 — Determining the enthalpy change of thermal decomposition of potassium hydrogencarbonate • PowerPoint 		
	Week 35	35.4 Determining the standard enthalpy change of formation of a compound from standard enthalpy changes of combustion	<ul style="list-style-type: none"> • $\Delta H_f[\text{compound}] = \sum \Delta H_c[\text{constituent elements}] - \Delta H_c[\text{compound}]$ 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Practice 35.4 	7,10
	Week 35	35.5 Determining the standard enthalpy change of a reaction from standard enthalpy changes of formation	<ul style="list-style-type: none"> • $\Delta H_r = \sum \Delta H_f [\text{products}] - \sum \Delta H_f [\text{reactants}]$ 	SL	<ul style="list-style-type: none"> • PowerPoint • Concept mapping 	<ul style="list-style-type: none"> • Practice 35.5 • Unit exercise • Topic exercise 	7,10
		Topic 10 Rate of Reaction					
		Unit 36 An introduction to rate of reaction					
	Week 36	36.1 Fast and slow reactions	<ul style="list-style-type: none"> • Examples of fast and slow reactions 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		2,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
	Week 36	36.2 The rate of a reaction	<ul style="list-style-type: none"> Determining the rate of a reaction by measuring – the change in concentration (or amount) of a reactant per unit time, or– the change in concentration (or amount) of a product per unit time 	SL	<ul style="list-style-type: none"> PowerPoint 		10
	Week 36	36.3 Instantaneous rate of reaction	<ul style="list-style-type: none"> Determining the instantaneous rate of reaction by measuring the slope of the tangent to a concentration-time curve at a particular time 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 	<ul style="list-style-type: none"> Practice 36.1 	7,10
	Week 36	36.4 Methods for following the progress of a reaction	<ul style="list-style-type: none"> Methods using a variety of physical properties of the reaction mixture Titrimetric analysis 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 36	36.5 Following the progress of a reaction by measuring the change in volume of a gaseous product	<ul style="list-style-type: none"> Following the progress of the reaction between magnesium and dilute hydrochloric acid by measuring the volume of hydrogen produced 	SL	<ul style="list-style-type: none"> Activity 36.1 — Following the progress of a reaction by measuring the change in volume of a gaseous product. PowerPoint 		10
	Week 36	36.6	<ul style="list-style-type: none"> Following the progress 	SL	<ul style="list-style-type: none"> PowerPoint 		10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
		Following the progress of a reaction by measuring the change in mass of the reaction mixture	of the reaction between calcium carbonate and dilute hydrochloric acid by measuring the loss in mass of the reaction mixture				
	Week 36	36.7 Following the progress of a reaction by measuring the change in pressure of the reaction mixture	<ul style="list-style-type: none"> Following the progress of the reaction between magnesium and dilute hydrochloric acid using a pressure sensor 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Practice 36.2 	7,10
	Week 36	36.8 Following the progress of a reaction by measuring the change in colour intensity of the reaction mixture	<ul style="list-style-type: none"> Following the progress of the oxidation of oxalate ions by permanganate ions using a colorimeter Basic components of a colorimeter 	SL	<ul style="list-style-type: none"> PowerPoint 		10
	Week 36	36.9 Following the progress of a reaction by measuring the change in turbidity of the reaction mixture	<ul style="list-style-type: none"> Following the progress of the reaction between sodium thiosulphate solution and dilute sulphuric acid by measuring the time to reach an opaque stage 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Practice 36.3 	7,10
	Week 36	36.10 Following the progress of a	<ul style="list-style-type: none"> Following the progress of the alkaline hydrolysis 		<ul style="list-style-type: none"> PowerPoint Discussion 	<ul style="list-style-type: none"> Unit exercise 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
		reaction using titrimetric analysis	of ethyl ethanoate <ul style="list-style-type: none"> • Common quenching techniques • Advantages and disadvantages of using titrimetric analysis 		<ul style="list-style-type: none"> • Concept mapping 		
		Unit 37 Factors affecting the rate of a reaction					
	Week 37	37.1 Factors affecting the rate of a reaction	<ul style="list-style-type: none"> • Concentration • Surface area • Temperature • Catalyst 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		10
	Week 37	37.2 Studying the effect of change in concentration of a reactant on the rate of a reaction	<ul style="list-style-type: none"> • Effect of varying the concentration of permanganate ions on the rate of its reaction with oxalate ions in an acidic solution 	SL	<ul style="list-style-type: none"> • Activity 37.1 — Investigating the effect of varying the concentration of hydrochloric acid on the rate of its reaction with magnesium • Activity 37.2 — Investigating the effect of varying the concentration of hydroxide ion on the rate of its reaction with 	<ul style="list-style-type: none"> • Practice 37.1 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
					phenolphthalein • PowerPoint		
	Week 37	37.3 Studying the effect of change in surface area of a solid reactant on the rate of a reaction	• Comparing the rate of reaction of dilute hydrochloric acid with powdered calcium carbonate / calcium carbonate lumps	SL	• Activity 37.3 — Investigating the effect of varying the surface area of marble chips on the rate of their reaction with dilute hydrochloric acid • PowerPoint • Discussion	• Practice 37.2	7,10
	Week 37	37.4 Studying the effect of change in temperature on the rate of a reaction	• Effect of varying the temperature on the rate of a reaction	SL	• Activity 37.4 — Investigating the effect of varying the temperature on the rate of the reaction between sodium thiosulphate solution and dilute sulphuric acid • Activity 37.5 — Investigating the effect of varying the temperature on the rate of the reaction between ingredients of Alka Seltzer tablet	• Practice 37.3	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
					<ul style="list-style-type: none"> • PowerPoint • Discussion 		
	Week 37	37.5 Studying how the presence of a catalyst affects the rate of a reaction	<ul style="list-style-type: none"> • What a catalyst is • Positive and negative catalysts 	SL	<ul style="list-style-type: none"> • Activity 37.6 — Catalyzing the decomposition of hydrogen peroxide in solution • PowerPoint 		10
	Week 37	37.6 Reaction rate and effective collisions	<ul style="list-style-type: none"> • Why does reaction rate increase with the concentration of reactants? • Why does reaction rate increase with the surface area of a solid reactants? • Why does reaction rate increase with temperature? 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 		10
	Week 37	37.7 Why does reaction rate increase with the concentration of reactants?	<ul style="list-style-type: none"> • Industrial catalysts • Catalytic converters in car exhaust systems • Hydrogenation of unsaturated vegetable oils 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Practice 37.4 	7,10
	Week 37	37.8 Why does reaction rate increase with the surface area of a solid reactant?		SL	<ul style="list-style-type: none"> • PowerPoint 		10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
	Week 37	37.9 Why does reaction rate increase with the temperature?		SL	• PowerPoint	• Practice 37.5	7,10
	Week 37	37. 10 Applications of catalysts		SL	• PowerPoint • Discussion		2,10
	Week 37	37.11 Enzymes	• Yeast and fermentation • Uses of enzymes in industries	SL	• PowerPoint • Discussion • Concept mapping	• Unit exercise	2,7,10
		Unit 38 Gas volume calculations					
	Week 38	38.1 The relationship between gas volume and moles: Avogadro's Law	• Equal volumes of gases at the same temperature and pressure contain equal numbers of particles	SL	• PowerPoint		10
	Week 38	38.2 Molar volume of a gas	• Calculations involving mass, number of moles and volume of a gas	SL	• Activity 38.1 — Determining the molar volume of carbon dioxide • PowerPoint	• Practice 38.1 • Practice 38.2	7,10
	Week 38	38.3 Calculations from chemical equations	• Steps for calculating the quantities of reactants or products in a reaction • Calculations involving masses and gas volumes	SL	• PowerPoint	• Practice 38.3	7,10
	Week 38	38.4 Gas volume – gas volume	• Calculations involving gas volumes	SL	• PowerPoint • Concept mapping	• Practice 38.4 • Unit exercise	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
		calculations from chemical equations				• Topic exercise	
		Topic 11 Chemical Equilibrium					
		Unit 39 An introduction to chemical equilibrium					
	Week 39	39.1 Irreversible and reversible reactions	<ul style="list-style-type: none"> • What irreversible reactions and reversible reactions are • Examples of reversible reactions – aqueous solution containing cobalt(II) ions – esterification 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	• Checkpoint	7,10
	Week 39	39.2 Equilibrium	<ul style="list-style-type: none"> • Introducing static equilibrium and dynamic equilibrium 	SL	• PowerPoint		10
	Week 39	39.3 Chemical equilibrium for a reversible reaction	<ul style="list-style-type: none"> • Variation of concentrations and reaction rates with time during the course of a reversible reaction • Rate of forward reaction = rate of backward reaction at equilibrium 	SL	• PowerPoint		10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
	Week 39	39.4 The importance of a closed system	<ul style="list-style-type: none"> Explaining the importance of a closed system when establishing a state of equilibrium 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 	<ul style="list-style-type: none"> Checkpoint 	7,10
	Week 39	39.5 Equilibrium established from either direction of a reaction	<ul style="list-style-type: none"> Using an example to illustrate that equilibrium can be reached from either direction of a reaction 	SL	<ul style="list-style-type: none"> PowerPoint Discussion 		10
	Week 39	39.6 Effect of changing conditions on chemical equilibrium systems	<ul style="list-style-type: none"> Effect of concentration changes on the chromate / dichromate system 	SL	<ul style="list-style-type: none"> Activity 39.1 — Investigating the effects of concentration changes on two chemical equilibrium systems PowerPoint 		10
	Week 39	39.7 Characteristics of a system in dynamic equilibrium	<ul style="list-style-type: none"> Summarizing the characteristics of a system in dynamic equilibrium 	SL	<ul style="list-style-type: none"> PowerPoint 		10
	Week 39	39.8 The equilibrium constant	<ul style="list-style-type: none"> Illustrating that the equilibrium constant, K_c, for a specific reaction always has the same value at a given temperature by using an example 	SL	<ul style="list-style-type: none"> PowerPoint 		10
	Week 39	39.9 The equilibrium law	<ul style="list-style-type: none"> Writing the expression for equilibrium constant, 	SL	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Checkpoint 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
			<p>K_c, from equilibrium concentrations</p> <ul style="list-style-type: none"> • Units of equilibrium constant • Relationship of equilibrium constant to the chemical equation 				
	Week 39	39.10 Calculating equilibrium constants	<ul style="list-style-type: none"> • Calculating equilibrium constants from equilibrium concentrations 	SL	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Checkpoint 	7,10
	Week 39	39.11 What does the equilibrium constant tell us?	<ul style="list-style-type: none"> • Judging the extent of a reaction • Predicting the direction of a reaction by comparing Q_c and K_c • Calculating equilibrium concentrations 	SL	<ul style="list-style-type: none"> • PowerPoint • Discussion 	<ul style="list-style-type: none"> • Checkpoint 	7,10
	Week 39	39.12 Equilibrium systems involving components in more than one state	<ul style="list-style-type: none"> • Writing an expression for equilibrium constant of an equilibrium system involving components in more than one state 	SL	<ul style="list-style-type: none"> • PowerPoint 		10
	Week 39	39.13 Determining the equilibrium constant for an esterification reaction experimentally	<ul style="list-style-type: none"> • Determining the equilibrium constant, K_c, for an esterification reaction — the reaction 	SL	<ul style="list-style-type: none"> • Activity 39.2 — Determining the equilibrium constant, K_c, for an esterification 	<ul style="list-style-type: none"> • Checkpoint • Unit exercise 	7,10

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values [#]
			between ethanoic acid and propan-2-ol		reaction between ethanoic acid and propan-1-ol • PowerPoint • Concept mapping		
	Week 40	Revision Week					
	Week 41 to 43	Final Examination					

* The extended parts should be marked with asterisks. These parts should be more challenging and can be covered when the students can master the knowledge and skills covered in the conventional topics.

Core Values of Wah Yan College, Kowloon

I. Love and care	1. Accept & feel positive about himself 2. Appreciation & Gratitude 3. Empathy & Compassion	4. Forgiveness & Reconciliation 5. Service 6. Family as a basic unit of society; marriage is the foundation of a family
II. Strive for excellence	7. Reflective 8. Commitment 9. Perseverance	10. Curiosity & willingness to learn 11. Value imagination and creativity
III. Respect and Justice	12. Life is valuable and respectable 13. Openness to good in all things 14. Respect for himself & others	15. Integrity 16. Faithfulness
IV. Responsibility	17. Freedom & Self-discipline 18. Care for the environment	19. Social Identities: citizen identity, national identity and global citizen identity
V. Faith	20. Experience of God 21. Explore & practise one's faith	22. Appreciate religious liturgies

