مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan –YEAR 9

Subject	**Chemistry**
Class/ Section	**Yr 9 A-F**
Week	**Week 5 - 26th September to 30th September**
Work send to students by	**Google classroom**
Total number of lessons per week	**3**
Unit/Topic	**Separations of mixtures – Chromatography and drinking water**
Key Vocabulary	**Rf values, mobile and stationary phase chromatogram, aquifers, sedimentation, chlorination and desalination**
	Week 5 - Lesson 1 and 2 Chromatography **Specific Learning objectives** C2.7 Explain the experimental techniques for separation of mixtures by paper chromatography. C2.9 Describe paper chromatography as the separation of mixtures of soluble substances by running a solvent (mobile phase) through the mixture on the paper (the paper contains the stationary phase), which causes the substances to move at different rates over the paper. C2.10 Interpret a paper chromatogram: (a) to distinguish between pure and impure substances (b) to identify substances by comparison with known substances (c) to identify substances by calculation and use of Rf values. **Specific Intended Learning Outcomes** Describe how some mixtures can be separated by

Tasks **Assessment Criteria/ Essential questions** **Resources**	chromatography Identify pure substances and mixtures on chromatograms. Identify substances that are identical on chromatograms. Interpret diagrams showing how chromatography is done. Explain how substances can be separated by chromatography. Calculate Rf values and use them to identify substances. **Tasks** 1. List the apparatus used for paper chromatography and identify the stationary and mobile phase. 2. Explain how different components of mixtures interact with mobile and stationary phases 3. Interpret a chromatogram 4. Calculate Rf value 5. Test the purity by analysing the chromatogram **Assessment Criteria/Essential questions** **Support:** How can chromatography used to separate mixtures **Stretch:** Calculate the Rf value for each dye in the ink from the chromatogram **Extend** : Draw a chromatogram using the solubilities of some different food colourings. Explain what you would see on the chromatogram. **Resources** Edexcel GCSE (9-1) students book , Doddle interactive presentation worksheets SC2c. for class work A power point to display learning objectives, tasks and images
	Lesson 3 - Drinking water **Specific Learning objectives** Describe how a) waste and ground water can be made potable, including the need for sedimentation, filtration and chlorination. b) seawater can be made potable by using distillation. c) water used in analysis must not contain any dissolved salts. Evaluate the risks in a practical procedure and suggest suitable precautions for a range of practicals, **Specific Intended Learning Outcomes** Explain why water used in chemical analysis must not contain dissolved salts.

	Describe how fresh water can be produced from seawater. Describe the steps needed to make fresh water suitable for drinking. Suggest how to purify water when you know what it contains. Evaluate the hazards and control the risks present when purifying water.
Tasks	**Tasks** 1. Watch the video of simple distillation (using boiling water and a cold surface) and describe desalination and answer questions 1 and 2 in the text book. 2. List the uses of tap water in chemical lab and explain why tap water is not used for chemical analysis (que. 3) 3. Using the annotated diagram given in text book summarising the main stages in water treatment. 4. Answer questions 4-6 in the textbook 5. Choose one hazard of using chlorine gas. Explain how the risk of harm from this hazard can be reduced for workers at a water treatment plant.
Assessment Criteria/ Essential questions	**Assessment Criteria/Essential questions** **Support** : Draw a flow chart to describe the two methods to describe how water can be made fit to drink **Stretch : Question E1 and E2-** A bottle of water has a label on it saying '**Suitable for chemical analysis'**. Describe how this water has been produced. Explain how you would check to see if this water really is suitable for analysis. **Extend** : What is coagulation in water treatment plant? Name a common coagulant used in water treatment plant
Resources	**<u>Resources</u>** Edexcel GCSE (9-1) students book , Doddle interactive presentation worksheets SC2e for class work A power point to display learning objectives, tasks and images

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan –YEAR 10

Subject	**Chemistry**
Class/ Section	**Year 10**
Week	**Week 5 -26th Sept- 30th Sept**
Work send to students by	**Google classroom**
Total No. of lessons per week	**4**
Unit/Topic	**SC8 Acids and Alkalis**
Key Vocabulary	**Acidic, alkaline, neutral, pH scale, indicators, polyatomic ions, aqueous solution, universal indicator**
Specific Learning objectives **Specific Intended Learning Outcomes**	**Lesson 1- SC8a Acids, Alkalis and Indicators** • Recall that acids in solution are sources of hydrogen ions and alkalis in solution are sources of hydroxide ions. • Recall that a neutral solution has a pH of 7 and that acidic solutions have lower pH values and alkaline solutions higher pH values. • Recall the effect of acids and alkalis on indicators, including litmus, methyl orange and phenolphthalein. • Recall that the higher the concentration of hydrogen ions in an acidic solution, the lower the pH; and the higher the concentration of hydroxide ions in an alkaline solution, the higher the pH. • Define acid & alkali and Classify the nature of substances as acidic , basic or neutral. • Define pH and understand the pH of different types of solutions. • Define & cite some examples indicators and identify different types of acids and alkalis using different types of indicators. • Analyse and establish the relationship between hydrogen ion concentration in a solution and the pH of the solution
Tasks	1. Recall that all aqueous solutions are either acidic, alkaline or neutral. Introduce in general the concept of what acids and bases are through *Doodle ppt acids and alkalis slides 3&4.*Ask the meaning of some hazard symbols. 2. Children identify hazard symbols and name some household products which are acidic alkaline or neutral through Q1-3 on pg 52 of T.Bk 3. Review the concept of pH scale and different indicators using *Doodle ppt acids and alkalis slides 5-9.* Discuss the colour change that indicates if a liquid is acidic alkaline or neutral. 4. Children give examples and formulae of some common acids and alkalis and observe what is common in formulae of all acids and all

	alkalis. 5. Explain the relationship between the concentration of H or OH ions in the aqueous solutions and the strength of acid or alkali. 6. Through diagram of ions in aqueous solution children identify if something is strong or weak acid or alkali.
Assessment Criteria/ Essential questions	**Support –** Identify hazard symbols and differentiate between acids and alkalis on the basis of ions they contain. **Stretch-** Describe an acid or alkali based on the pH it has and tests using different indicators. **Extend-** Explain how the strength of acid or alkali change by changing the concentration of H and OH in the solutions.
Resources	Edexcel GCSE 9-1 chemistry Text Book, ppt on acids and alkalis. Doodle ppt Acids and Alkalis.

Key Vocabulary	**Concentrated, dilute, pH meter, strong and weak acids, dissociate**
Specific Learning objectives **Specific Intended Learning Outcomes**	**Lesson 2- SC8b Looking at acids** • Recall that as hydrogen ion concentration in a solution increases by a factor of 10, the pH of the solution decreases by 1. • Explain the terms dilute and concentrated, with respect to amount of substances in solution. • Explain the terms weak and strong acids, with respect to the degree of dissociation into ions. • Correlate that as hydrogen ion concentration in a solution increases by a factor of 10, the pH of the solution decreases by 1. • Understand the unit of concentration. • Differentiate between dilute and concentrated, with respect to amount of substances in solution. • Define weak and strong acid and cite some examples for weak and strong acids. • Explain the terms dilute and concentrated, with respect to amount of substances in solution.
Tasks	1. Recall what concentrated and dilute solutions are. Through some examples explain how to calculate the concentration and establish its unit. Use *Doodle ppt Strong and Weak acids slides 4-7.* 2. Children calculate the concentration of sulphuric acid through question1. 3. Correlate that as hydrogen ion concentration in a solution increases by a factor of 10, the pH of the solution decreases by 1. Use *Doodle ppt Strong and Weak acids slides12-14.* 4. Children calculate the pH and strength of solution through questions 3-5. 5. Explain the difference between strong and weak acids through the concept of dissociation and give examples of the same . *Doodle ppt*

	Strong and Weak acids slides 9-10. 6. Question 7 helps them to understand how to compare a strong and weak acids.
Assessment Criteria/ Essential questions	**Support –** Calculate the concentration of an acid using the given data **Stretch-** Describe the difference between strong and weak acids and give examples through q 6 & 7 pg 55 of T.Bk **Extend- Q E1 Pg 55** Explain how concentrated solution of a weak acid could have the same pH and similar reactions to a dilute solution of a strong acid
Resources	Edexcel GCSE 9-1 chemistry Text Book, AT ppt on strong and weak acids , Doodle ppt strong and weak acids.

Key Vocabulary	**Bases, neutralize, salts, state symbol, filter, crystallization**
Specific Learning objectives **Specific Intended Learning Outcomes**	**Lesson 3 and 4 - SC8c Bases and Salts** • Recall that a base is any substance that reacts with an acid to form a salt and water only. • Explain the general reactions of aqueous solutions of acids with metal oxides to produce salts • Describe a neutralisation reaction as a reaction between an acid and a base. Explain why, if soluble salts are prepared from an acid and an insoluble reactant: a. excess of the reactant is added b. the excess reactant is removed c. the solution remaining is only salt and water. • Define base and explain the different types of bases. • Define alkali and differentiate between alkali and base. • Write word equation and balanced symbol equation for the reaction. • Define neutralization reaction. Write word equation and balanced symbol equation for the reaction. • Describe the steps involved in preparing a soluble salt from an acid and an insoluble reactant. • Explain why an excess of insoluble reactant is used when preparing a soluble salt and why the excess reactant is removed when preparing a soluble salt. • Explain why the remaining solution contains only a salt and water, when preparing a soluble salt from an acid and an insoluble reactant.
Tasks	1. Recall what bases and alkalis are and ask some examples of weak and strong alkalis and their pH. Review neutralization reaction with both metal oxides and alkalis as examples using *Doodle ppt Neutralization slides3-6.* 2. Review writing word equations for some reactions. Explain how to write a formula equation and write state symbols in them. 3. Children answer questions 1-4 on page 56-57 of text book. 4. Using *AT Presentation* forming soluble salts explain how a soluble salt is produced using an acid and an insoluble reactant like metal

	oxide. Alternatively use *Doodle ppt Neutralization slides12-14.* 5. Emphasise on the steps and explain the importance of using excess of the insoluble salt and removing the excess reactant by filtration. 6. Question 5a-e helps the children to revise different steps of the method of preparing soluble salts.
Assessment Criteria/ Essential questions	**Support –** Questions 1-4 on page 56-57 of text book helps them to understand how to write a formula equation and express state symbols of the reactants and products. **Stretch-** Describe different steps of the method of preparing soluble salts through Question 5a-e **Extend** -Justify why reaction of an acid with metal oxides is a neutralization reaction using hydrogen ion concept.
Resources	Edexcel GCSE 9-1 chemistry Text Book, AT ppt. on formation of soluble salts, Doodle ppt. Neutralization.

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan – YEAR 11

Subject	**Chemistry**
Class/ Section	**Yr 11 A-F**
Week	**Week 5: 26th Sept to 30th September, 2021**
Work send to students by	**Google classroom**
Total number of lessons per week	**5**
Unit/Topic	**Hydrocarbons**
Key Vocabulary	crude oil, hydrocarbons, petrochemicals, fossil fuels, fractional distillation, fractionating column, viscosity

Lesson - **Live Zoom lesson along with face to face instruction for students present on a particular day** **Work will be assigned in google classroom which will be matched to the students' ability.** **Assessment Criteria/ Essential questions:**	**Lesson 1 & 2:** **Specific Learning objectives:** • Recall that hydrocarbons are compounds that contain carbon and hydrogen only. • Describe crude oil as a complex mixture of hydrocarbons • Recall that petrol, kerosene and diesel oil are non-renewable fossil fuels obtained from crude oil and methane is a non-renewable fossil fuel found in natural gas. • Describe and explain the separation of crude oil into simpler, more useful mixtures by the process of fractional distillation. • Recall the names and uses of the following fractions: gases, petrol, kerosene, diesel, fuel oil and bitumen. • Explain how hydrocarbons in different fractions differ from each other **Specific Intended Learning Outcomes:** • Describe that the chemicals obtained from crude oil are called hydrocarbons and that a hydrocarbon is a molecule consisting of carbon and hydrogen atoms only. • Understand the terms fossil fuel, renewable resource and non-renewable resource. • Explain the process of fractional distillation to separate the crude oil into useful fractions. • Describe the relationship between molecule size and boiling point, viscosity, ease of ignition, and flammability. • Analyses given data on organic chemicals that come from crude oil, recognize their uses in the modern chemical industry and evaluate the environmental implications of oil spillages. **Tasks:** 1. Students to predict the meaning of the term Hydrocarbon'. 2. Students to compare and contrast renewable and non-renewable resources. 3 Show an image of Crude oil and ask students which method they would use to separate the different fractions from crude oil. 4. Students complete Worksheet SC20b.2, which involves a card sort. They match fractions to their exit position from a fractionating column, then match the uses to the fractions. **Support:** Why are crude oil and natural gas useful? **Stretch:** Why is crude oil an important finite source of non-renewable substances? **Extend:** Describe the relationship between the number of carbon atoms in a hydrocarbon molecule and the physical properties of the hydrocarbon.
Resources:	Edexcel GCSE (9-1)Chemistry textbook. Interactive power point from Board works, Video

	Lesson 3: **Specific Learning objectives:** • Explain an homologous series as a series of compounds which: **a** have the same general formula **b** differ by CH_2 in molecular formulae from neighbouring compounds **c** show a gradual variation in physical properties, as exemplified by their boiling points **d** have similar chemical properties. • Recall the formulae of molecules of the alkanes and alkenes and draw the structures of these molecules, showing all covalent bonds. • Explain why the alkanes are saturated hydrocarbons and alkenes are unsaturated hydrocarbons, **Specific Intended Learning Outcomes:** • Define terms saturated and unsaturated as applied to alkanes and alkenes. • State the names, formulae and structures of the first four members of the alkane and alkene homologous series. • Identify general formula for homologous series of hydrocarbons • Classify **some** unknown compounds from their molecular and/or structural formula into alkane and alkene. • Draw the structures of isomers of the given alkane or alkene **Tasks:** 1. Students write the names, molecular fomulae and structures of the models of alkanes and alkenes. 2. Students answer Qs from text bk pg,154-155 3 They draw the structures of isomers of the given alkane or alkene . 4. Students answer Qs from text bk pg,172-173
Assessment Criteria/ Essential questions:	**Support:** What are the features of a homologous series? **Stretch:** Describe how the boiling points of alkanes change as the number of carbon atoms in the molecules changes. **Extend:** Represent a five-carbon alkene using structural and molecular formulae. Suggest ways in which isomers of this hydrocarbon may be different.
Resources:	Edexcel GCSE (9-1)Chemistry textbook. Interactive power point from Board works, Video

	Lesson 4: **Specific Learning objectives:** • Describe how the complete combustion of alkanes and alkenes involves the oxidation of the hydrocarbons to produce carbon dioxide and water • Explain how bromine water is used to distinguish between alkanes and alkenes. **Specific Intended Learning Outcomes:** • Understand that the complete combustion of hydrocarbons produces carbon dioxide and water and that the incomplete combustion of hydrocarbons produces carbon monoxide and water and sometimes carbon (soot) • Explains the toxic nature of carbon monoxide with respect to its ability to bind to blood. • **Plan an experiment** to determine the presence of C=C in a variety of organic compounds using bromine water. **Tasks:** 1. Students write balanced chemical equations for complete and incomplete combustion of alkanes and research on the harmful effects of incomplete combustion. 2. Students answer Qs from text bk pg,156-157 Students relate the reactivity of alkenes to the presence of a double bond. They write balanced chemical equations for the addition reactions of alkenes. 3. Students answer Qs from text bk pg,174-175
Assessment Criteria/ Essential questions:	**Support** – What are the products of complete combustion of propane in oxygen? **Stretch –** Explain why ethane does not undergo addition reactions. **Extend –** But-2-ene reacts with bromine. Draw out the equation for this reaction using structural formulae and name the product.
Resources:	Edexcel GCSE (9-1)Chemistry textbook. Interactive power point from Board works, Video
	Lesson 5: **Specific Learning objectives:** • Explain how impurities in some hydrocarbon fuels result in the production of sulfur dioxide. • Explain some problems associated with acid rain caused when sulfur dioxide dissolves in rain water. • Explain why, when fuels are burned in engines, oxygen and nitrogen can react together at high temperatures to produce oxides of nitrogen, which are pollutants.. **Specific Intended Learning Outcomes:** • Know that burning fuels releases carbon dioxide, water (vapour), carbon monoxide, sulphur dioxide and oxides of nitrogen into the atmosphere.

	• Understand that sulfur dioxide from the combustion of fossil fuels reacts with water in the air to form acid rain • Describe the socio-economic and environmental effects of acid rain to include corrosion of limestone buildings and statues, killing fish in rivers and lakes and defoliating trees. • Describe the measures used to prevent acid rain, including removing sulfur from fuels before combustion burning less fossil fuels, removing sulfur dioxide from industrial and vehicle emissions. **Tasks:** 1. Students watch a video of burning of Sulphur in oxygen, dissolving the oxide in water and testing the resulting solution with Universal indicator paper. 2. Students relate the observation to acid rain caused by oxides of sulphur and nitrogen, produced by burning of fossil fuels. 3. Students watch the video on causes and effects of acid rain. 4. Students write balanced chemical equations for formation of sulphurous and sulphuric acid. 5. Students answer Qs from text bk pg,158-159
Assessment Criteria/ Essential questions:	**Support:** Write a balanced equation for the reaction between sulphur and oxygen. **Stretch:** Explain why the use of some hydrocarbon fuels causes the production of sulphur dioxide and oxides of nitrogen. **Extend:** Catalytic converters can reduce nitrogen dioxide, forming nitrogen and oxygen. Write a balanced equation for this reaction.
Resources:	Edexcel GCSE (9-1)Chemistry textbook. Interactive power point from Board works, Video

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan –YEAR 12

Subject	**Chemistry**
Class/ Section	**Yr 12 – Batch A/B**
Week	**Week 5: 26th Sept to 30th September, 2021**
Work send to students by	**Google classroom**
Total number of lessons per week	**3**
Unit/Topic	**2. Chemical Bonding and Structure**
Key Vocabulary	Metallic bonding, electrical and thermal conductivity, malleability and ductility, delocalised electrons, cations, ionic bond, charge, bond strength, ionic radii, brittle. solubility
Lesson - Live Zoom lesson along with face to face instruction for students present on a particular day **Work will be assigned in google classroom which will be matched to the students' ability.** **Assessment Criteria/ Essential questions:**	**Lesson 1:** **Specific Learning objectives:** • Know that metallic bonding is the strong electrostatic attraction between metal ions and the delocalised electrons • Explain the properties of metals based on structure and bonding • Explain the trends in the melting points of metals across a period and down the group **Specific Intended Learning Outcomes:** • Describe metallic structure • Define metallic bond • Reason why most metals have high m.p, are malleable, ductile and good electrical and thermal conductors. • Reason why melting point increases across a period but decreases down the group **Tasks:** **1.** Students recall metallic structure, metallic bond and properties of metals. **2.** Teacher asks probing Qs to enable students to reason the properties of metals and to deduce the relationship between number of delocalised electrons per ion and the size of the cation, with melting point of a metal. **3.** Students answer Qs on pg. 37 **Support** – Draw a diagram to represent metallic structure and define metallic bond. **Stretch -** Why does Aluminium have a higher melting point than sodium and magnesium? **Extend –** Research on the properties exhibited by Transition metals.
Resources:	Edexcel AS/A level chemistry 1 Textbook Interactive power point from Board works Video

	Lesson 2 & 3: **Specific Learning objectives:** • Know that ionic bonding is the strong electrostatic attraction between oppositely charged ions • Understand the effects that ionic radius and ionic charge have on the strength of ionic bonding. • Be able to draw electronic configuration diagrams of cations and anions using dot-and-cross diagrams • Understand reasons for the trends in ionic radii down a group and for a set of isoelectronic ions, e.g. N^{3-} to Al^{3+} • Understand that the physical properties of ionic compounds and the migration of ions provide evidence for the existence of ions **Specific Intended Learning Outcomes:** • Review that ionic compounds are formed by transfer of electrons where the resulting ions have noble gas configuration. • Reasons out why magnesium oxide has stronger ionic bonding than calcium oxide. • Draw the dot-and-cross diagram of a known compound (e.g. sodium chloride) and use it to predict the dot-and-cross diagram for less familiar compounds (e.g. potassium fluoride). • Predict the trends in ionic radii in a group and in a period. • Draw the diagram of electrolysis apparatus and show the movement of migration of ions. • Predict the colours at each electrode **Tasks:** 1. Students recall the definition of ionic bond. 2. Teacher displays a table of size of cations and the amount of energy required to separate the ions to infinity (kJ/mol) 3. Students deduce the relationship between the strength of ionic bond and charge and size of ions. 4. Teacher explains the trends in ionic radii down a group and for a set of isoelectronic ions. 5. Students deduce the properties of ionic compounds based on structure and bonding. 6. Students draw dot and cross diagrams for different ionic compounds. 7. Teacher explains the evidence for the existence of ions, based on electrolysis experiment.
Assessment Criteria/ Essential questions:	**Support** – Define ionic bond **Stretch –** Suggest why the strength of ionic bonding is greater in sodium fluoride than in potassium iodide. **Extend –** Explain the trend in the ionic radii of $Ca^{2+} > Mg^{2+} > Be^{2+}$
Resources:	Edexcel AS/A level chemistry 1 Textbook Interactive power point from Board works Video

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ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan – YEAR 12

Subject	**Chemistry**
Class/ Section	**Year 12 - Batch 1 and 2**
Week	**Week 5 – 26th September – 30th Sept**
Work send to students by	**Google classroom**
Total number of lessons per week	**3**
Unit/Topic	**Topic 5 – Formulae , equations and amount of substance**
Key Vocabulary	**Moles , Relative Atomic mass , parts per million**
Lessons 1,2,3 –Live Zoom lesson along with face to face instruction for students present on a particular day **Work will be assigned in google classroom which will be matched to the students ability.**	**Lesson 1 – Reactions** **Specific Learning objectives** Reinforce the concept of titration. **Specific Intended Learning Outcomes** Solve different questions based on titration from past papers **Tasks** Recall the apparatus and safety precautions for the titration experiment. Solve problems based on titration. Assessment Criteria/ Essential questions Support: Solve problems based on acid alkali reaction. Stretch: Solve problems on redox titration Extend: Write the procedure for the redox titration **Lesson 2 and 3 -** **Specific Learning objectives** Solve the problems based on back titration. **Specific Intended Learning Outcomes**

Resources	Define the concept of back titration. Únderstand how it is different from normal titration **Tasks:** Discuss the concept of back titration. Watch the video of back titration. Solve problems based on back titration. **Assessment Criteria/ Essential questions** Support: Write the equations involved in back titration. Stretch: Calculate the moles in initial and final stageof back titration. Extend: Calculate the percentage purity if metal or metal carbonate in the given question. Edexcel A level Chemistry 2 Textbook Interactive power point from Board works

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan –YEAR 13

Subject	**Chemistry**
Class/ Section	**Year 13 - Batch 1 and 2**
Week	**Week 5 – 26th September – 30th Sept**
Work send to students by	**Google classroom**
Total number of lessons per week	**3**
Unit/Topic	**Topic 15 Transition Metals**
Key Vocabulary	**Vanadium , electrode potential**

Lessons 1,2,3 –Live Zoom lesson along with face to face instruction for students present on a particular day **Work will be assigned in google classroom which will be matched to the students ability.** **Assessment Criteria/ Essential questions** **Resources** **Assessment Criteria/ Essential questions** **Resources**	**Lesson 1 –** **Specific Learning objectives** Know the colours of the oxidation states of vanadium (+5, +4, +3 and +2) in its compounds. **Specific Intended Learning Outcomes** Discuss the colours of vanadium compounds in the different oxidation states. Find the oxidation state of vanadium in different vanadium compounds. **Tasks:** Watch the colours of vanadium compounds. Discuss the situation for which the vanadium compounds react with other metals and get reduced to other oxidation state. Support: Identify the colours of vanadium ions. Stretch: Explain why tin cannot act as a reducing agent with dioxovandium ions. Extend: Explain whether copper(II) ions can be used to oxidise oxovandium to dioxovanadium ions. Edexcel A level Chemistry 2 Textbook Interactive power point from Board works **Lesson 2 and 3 – Reactions of Vanadium** **Specific Learning objectives** Understand redox reactions for the interconversion of the oxidation states of vanadium (+5, +4, +3 and +2), in terms of the relevant E^0 values. **Specific Intended Learning Outcomes** Discuss the interconversion reactions of vanadium in different oxidation states based on the E^0 values Identify the colour change in each reactions of vanadium. **Tasks:** Discuss the electrode potential of different half equations with vanadium. Write the reactions with vanadium and other metals Support: Write the configuration for different ions of vanadium. Stretch: Calculate the cell emf for different reactions of vanadium and other metals. Extend: Predict whether a reaction between vanadium compound and other metals is feasible or not. Edexcel A level Chemistry 2 Textbook Interactive power point from Board works

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan – YEAR 13

Subject	**Chemistry**
Class/ Section	**Year 13**
Week	**Week 5 : 26th September to 30th September, 2021**
Work send to students by	**Google classroom**
Total number of lessons per week	**3**
Unit/Topic	**Acid-base equilibria**
Key Vocabulary	**Buffer solution**
Lessons 1,2,3–Live Zoom lesson along with face to face instruction for students present on a particular day **Work will be assigned in google classroom which will be matched to the students ability.**	**Lesson 1&2 Buffer solutions** **Specific Learning objectives** 1. Reinforce the calculation of the pH of a buffer solution from the given data. 2. Reinforce the calculation of the concentrations of solutions required to prepare a buffer solution of a given pH. **Specific Intended Learning Outcomes.** • Define the term buffer solution • Explain the uses of buffer solutions • Explain how a buffer solution works • Calculate the pH of buffer solutions • Describe how a buffer solution can be made up for a given pH • Explain the buffer system in the blood. **Tasks:** 1.Review the principles behind making an acidic or a basic buffer solution. Explain how buffers resist small changes in pH. 2.Research-Buffers in biological systems. 3. Determine K_a from the pH at the point where half the acid is neutralised. 4. Do calculations to find pH of given buffer solutions, find the

Assessment Criteria/ Essential questions **Resources**	concentration of the different components needed to make a buffer of a given pH. 5.Answer the questions from textbook page no.42 **Support**: Calculate the pH of buffer solution. **Stretch**: calculate the concentrations of solutions required to prepare a buffer solution of a given pH. **Extended**: Explain the role of carbonic acid–hydrogen carbonate as a buffer in the control of blood pH. Explain buffer action in food. Edexcel A level Chemistry 2 textbook. Power point , Video
Assessment Criteria/ Essential questions **Resources**	**Lesson 3: Enthalpy changes of neutralisation for strong and weak acids.** **Specific Learning objectives** • Understand the roles of carbonic acid molecules and hydrogencarbonate ions in controlling the pH of blood • Understand why there is a difference in the standard enthalpy changes of neutralisation values for strong and weak acids. **Specific Intended Learning Outcomes** • Define enthalpy change of neutralisation. • Why the enthalpy change of neutralisation of a weak acid with a strong base is less than that for strong acid-strong base. • Why the enthalpy change of neutralisation of HF by NaOHis greater than 57.6KJmol^{-1} **Tasks:** 1. Review buffer action. 2.Discussion about what is happening in terms of the removal of a small number of H^+ ions and the logarithmic nature of the pH scale. 3. Give examples of buffers in biological systems – show how they work when small amounts of acid/alkali added 4. Compare the enthalpy changes of neutralization values of strong acid- strong base and strong acid – weak base/ strong base – weak acid. 5. Answer textbook questions. **Support:** Enthalpy change of neutralisation of strong acid with a strong base. **Stretch:** Enthalpy change of neutralisation for reaction between aq NH_3 and aq HCl **Extend:** Enthalpy change of neutralisation of HCN with NH_3 Edexcel A level Chemistry 2 textbook. Power point , Video