



SADIQ PUBLIC SCHOOL

SYLLABUS

Class: H2

Subject: Biology

Academic Session: 2021-2022

Books Recommended: biology fourth edition by Tailor Green Staurt

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|--|---|
| 1- | L-Energy and respiration | ATP energy currency, stages of aerobic respiration, anaerobic respiration, process of ATP synthesis effects of respiration by investigation |
| 2- | M-Photosynthesis | Photosynthesis as an energy transfer process, investigations of limiting factors, adaptations for photosynthesis |
| 3- | N-Homeostasis | Feedback mechanismstructure of kidney and nephron, role of ADH |
| 4- | O-Control and coordination | Nervous and endocrine systemsliding filament model, role of hormones, FSH, LH |
| 5- | P-Inherited change | Gene and allele, their role in determining phenotype, monohybrid and di hybrid cross, structural and regulatory genes |
| 6- | Q-Selection and evolution | Difference between continuous and discontinuous variation, natural and artificial selection, hardy Weinberg principle, mechanism of evolution |
| 7- | R-Biodiversity classification and conservation | Specie, ecosystem, niche, importance of random, sampling, taxonomic hierarchy, aquatic and terrestrial system |
| 8- | S-Genetic technology | Recombinant DNA, principles of PCR, role of restriction and endonucleases, genome sequencing, bioinformatics, advantages of producing human proteins, treatment of genetic disease by gene therapy, significance of genetic engineering in improving the quality and yield. |

Subject Teacher

Head of Department

Headmaster/Headmistress

Co-coordinator Academic Council



Sadiq Public School

Syllabus

Class: H2_____

Subject: _____CHEMISTRY_____

Academic Session: _____2021-22_____

Books Recommended: AS A LEVEL CHEMISTRY COURSEBOOK BY _____
 _____LAWRIE RYAN AND ROGER NORRIS_____

Details of Syllabus CIE 9701/2022-24

| S. No. | Chapter/Topic | Description |
|--------|---|--|
| | 23.1 Lattice energy and Born-Haber cycles | 1 define and use the terms: (a) enthalpy change of atomisation, ΔH_{at} (b) lattice energy, ΔH_{latt} (the change from gas phase ions to solid lattice) 2 (a) define and use the term first electron affinity, EA (b) explain the factors affecting the electron affinities of elements (c) describe and explain the trends in the electron affinities of the Group 16 and Group 17 elements 3 construct and use Born-Haber cycles for ionic solids (limited to +1 and +2 cations, -1 and -2 anions) 4 carry out calculations involving Born-Haber cycles 5 explain, in qualitative terms, the effect of ionic charge and of ionic radius on the numerical magnitude of a lattice energy |
| | 23.2 Enthalpies of solution and hydration 23.4 Gibbs free energy change, ΔG | 1 define and use the term enthalpy change with reference to hydration, ΔH_{hyd} , and solution, ΔH_{sol} 2 construct and use an energy cycle involving enthalpy change of solution, lattice energy and enthalpy change of hydration 3 carry out calculations involving the energy cycles in 23.2.2 4 explain, in qualitative terms, the effect of ionic charge and of ionic radius on the numerical magnitude of an enthalpy change of hydration 1 state and use the Gibbs equation $\Delta G_{\ominus} = \Delta H_{\ominus} - T\Delta S_{\ominus}$ 2 perform calculations using the equation $\Delta G_{\ominus} = \Delta H_{\ominus} - T\Delta S_{\ominus}$ 3 state whether a reaction or process will be feasible by using the sign of ΔG 4 predict the effect of temperature change on the feasibility of a reaction, given standard enthalpy and entropy changes |
| | 24.1 Electrolysis 24.2 Standard electrode potentials E_{\ominus} ; standard cell potentials E_{\ominus} cell and the Nernst equation 24.2 Standard electrode potentials E_{\ominus} ; standard cell potentials E_{\ominus} cell and the Nernst equation (continued) | 1 predict the identities of substances liberated during electrolysis from the state of electrolyte (molten or aqueous), position in the redox series (electrode potential) and concentration 2 state and apply the relationship $F = Le$ between the Faraday constant, F , the Avogadro constant, L , and the charge on the electron, e 3 calculate: (a) the quantity of charge passed during electrolysis, using $Q = It$ (b) the mass and/or volume of substance liberated during electrolysis 4 describe the determination of a value of the Avogadro constant by an electrolytic method 1 define the terms: (a) standard electrode (reduction) potential (b) standard cell potential 2 describe the standard hydrogen electrode 3 describe methods used to measure the standard electrode potentials of: |

| S. No. | Chapter/Topic | Description |
|--------|---|--|
| | | <p>(a) metals or non-metals in contact with their ions in aqueous solution</p> <p>(b) ions of the same element in different oxidation states</p> <p>4 calculate a standard cell potential by combining two standard electrode potentials</p> <p>5 use standard cell potentials to:</p> <p>(a) deduce the polarity of each electrode and hence explain/deduce the direction of electron flow in the external circuit of a simple cell</p> <p>(b) predict the feasibility of a reaction</p> <p>6 deduce from E^\ominus values the relative reactivity of elements, compounds and ions as oxidising agents or as reducing agents</p> <p>7 construct redox equations using the relevant half-equations</p> <p>8 predict qualitatively how the value of an electrode potential, E, varies with the concentrations of the aqueous ions</p> <p>9 use the Nernst equation, e.g. $E = E^\ominus + (0.059/z) \log [\text{oxidised species}]/[\text{reduced species}]$ to predict quantitatively how the value of an electrode potential varies with the concentrations of the aqueous ions; examples include $\text{Cu}^{2+}(\text{aq}) + 2\text{e}^- \rightleftharpoons \text{Cu}(\text{s})$, $\text{Fe}^{3+}(\text{aq}) + \text{e}^- \rightleftharpoons \text{Fe}^{2+}(\text{aq})$</p> <p>10 understand and use the equation $\Delta G^\ominus = -nE^\ominus$ cell F</p> |
| | <p>25.1 Acids and bases</p> <p>25.2 Partition coefficients</p> | <p>1 understand and use the terms conjugate acid and conjugate base</p> <p>2 define conjugate acid–base pairs, identifying such pairs in reactions</p> <p>3 define mathematically the terms pH, K_a, pK_a and K_w and use them in calculations (K_b and the equation $K_w = K_a \times K_b$ will not be tested)</p> <p>4 calculate $[\text{H}^+(\text{aq})]$ and pH values for:</p> <p>(a) strong acids</p> <p>(b) strong alkalis</p> <p>(c) weak acids</p> <p>5 (a) define a buffer solution</p> <p>(b) explain how a buffer solution can be made</p> <p>(c) explain how buffer solutions control pH; use chemical equations in these explanations</p> <p>(d) describe and explain the uses of buffer solutions, including the role of HCO_3^- – in controlling pH in blood</p> <p>6 calculate the pH of buffer solutions, given appropriate data</p> <p>7 understand and use the term solubility product, K_{sp}</p> <p>8 write an expression for K_{sp}</p> <p>9 calculate K_{sp} from concentrations and vice versa</p> <p>10 (a) understand and use the common ion effect to explain the different solubility of a compound in a solution containing a common ion</p> <p>(b) perform calculations using K_{sp} values and concentration of a common ion</p> <p>1 state what is meant by the term partition coefficient, K_{pc}</p> <p>2 calculate and use a partition coefficient for a system in which the solute is in the same physical state in the two solvents</p> <p>3 understand the factors affecting the numerical value of a partition coefficient in terms of the polarities of the solute and the solvents used</p> |
| | 26.1 Simple rate equations, orders of reaction and rate constants | <p>1 explain and use the terms rate equation, order of reaction, overall order of reaction, rate constant, half-life, rate-determining step and intermediate</p> <p>2 (a) understand and use rate equations of the form $\text{rate} = k [\text{A}]^m [\text{B}]^n$ (for</p> |

| S. No. | Chapter/Topic | Description |
|--------|---|---|
| | 26.2 Homogeneous and heterogeneous catalysts | <p>which m and n are 0, 1 or 2)</p> <p>(b) deduce the order of a reaction from concentration-time graphs or from experimental data relating to the initial rates method and half-life method</p> <p>(c) interpret experimental data in graphical form, including concentration-time and rate-concentration graphs</p> <p>(d) calculate an initial rate using concentration data</p> <p>(e) construct a rate equation</p> <p>3 (a) show understanding that the half-life of a first-order reaction is independent of concentration</p> <p>(b) use the half-life of a first-order reaction in calculations</p> <p>4 calculate the numerical value of a rate constant, for example by:</p> <p>(a) using the initial rates and the rate equation</p> <p>(b) using the half-life, $t_{1/2}$, and the equation $k = 0.693/t_{1/2}$</p> <p>5 for a multi-step reaction:</p> <p>(a) suggest a reaction mechanism that is consistent with the rate equation and the equation for the overall reaction</p> <p>(b) predict the order that would result from a given reaction mechanism and rate-determining step</p> <p>(c) deduce a rate equation using a given reaction mechanism and rate-determining step for a given reaction</p> <p>(d) identify an intermediate or catalyst from a given reaction mechanism</p> <p>(e) identify the rate determining step from a rate equation and a given reaction mechanism</p> <p>6 describe qualitatively the effect of temperature change on the rate constant and hence the rate of a reaction</p> <p>1 explain that catalysts can be homogeneous or heterogeneous</p> <p>2 describe the mode of action of a heterogeneous catalyst to include adsorption of reactants, bond weakening and desorption of products, for example:</p> <p>(a) iron in the Haber process</p> <p>(b) palladium, platinum and rhodium in the catalytic removal of oxides of nitrogen from the exhaust gases of car engines</p> <p>3 describe the mode of action of a homogeneous catalyst by being used in one step and reformed in a later step, for example:</p> <p>(a) atmospheric oxides of nitrogen in the oxidation of atmospheric sulfur dioxide</p> <p>(b) Fe^{2+} or Fe^{3+} in the $\text{I}^-/\text{S}_2\text{O}_8^{2-}$ reaction</p> |
| | Group 2 27.1 Similarities and trends in the properties of the Group 2 metals, magnesium to barium, and their compounds | <p>1 describe and explain qualitatively the trend in the thermal stability of the nitrates and carbonates including the effect of ionic radius on the polarisation of the large anion</p> <p>2 describe and explain qualitatively the variation in solubility and of enthalpy change of solution, $\Delta H^\ominus_{\text{sol}}$, of the hydroxides and sulfates in terms of relative magnitudes of the enthalpy change of hydration and the lattice energy</p> |
| | Chemistry of transition elements 28.1 General physical and chemical properties of the first row of transition elements, titanium to copper | <p>1 define a transition element as a d-block element which forms one or more stable ions with incomplete d orbitals</p> <p>2 sketch the shape of a $3d_{xy}$ orbital and $3d_{z^2}$ orbital</p> <p>3 understand that transition elements have the following properties:</p> <p>(a) they have variable oxidation states</p> <p>(b) they behave as catalysts</p> <p>(c) they form complex ions</p> |

| S. No. | Chapter/Topic | Description |
|--------|--|---|
| | <p>28.2 General characteristic chemical properties of the first set of transition elements, titanium to copper</p> <p>28.4 Stereoisomerism in transition element complexes</p> | <p>(d) they form coloured compounds</p> <p>4 explain why transition elements have variable oxidation states in terms of the similarity in energy of the 3d and the 4s sub-shells</p> <p>5 explain why transition elements behave as catalysts in terms of having more than one stable oxidation state, and vacant d orbitals that are energetically accessible and can form dative bonds with ligands</p> <p>6 explain why transition elements form complex ions in terms of vacant d orbitals that are energetically Accessible</p> <p>1 describe and explain the reactions of transition elements with ligands to form complexes, including the complexes of copper(II) and cobalt(II) ions with water and ammonia molecules and hydroxide and chloride ions</p> <p>2 define the term ligand as a species that contains a lone pair of electrons that forms a dative covalent bond to a central metal atom / ion</p> <p>3 understand and use the terms</p> <p>(a) monodentate ligand including as examples H₂O, NH₃, Cl⁻ and CN⁻</p> <p>(b) bidentate ligand including as examples 1,2-diaminoethane, <i>en</i>, H₂NCH₂CH₂NH₂ and the ethanedioate ion, C₂O₄²⁻</p> <p>(c) polydentate ligand including as an example EDTA⁴⁻</p> <p>4 define the term complex as a molecule or ion formed by a central metal atom / ion surrounded by one or more ligands</p> <p>5 describe the geometry (shape and bond angles) of transition element complexes which are linear, square planar, tetrahedral or octahedral</p> <p>6 (a) state what is meant by coordination number</p> <p>(b) predict the formula and charge of a complex ion, given the metal ion, its charge or oxidation state, the ligand and its coordination number or geometry</p> <p>7 explain qualitatively that ligand exchange can occur, including the complexes of copper(II) ions and cobalt(II) ions with water and ammonia molecules and hydroxide and chloride ions</p> <p>8 predict, using E^\ominus values, the feasibility of redox reactions involving transition elements and their ions</p> <p>9 describe the reactions of, and perform calculations involving:</p> <p>(a) MnO₄⁻ / C₂O₄²⁻ in acid solution given suitable data</p> <p>(b) MnO₄⁻ / Fe²⁺ in acid solution given suitable data</p> <p>(c) Cu²⁺ / I⁻ given suitable data</p> <p>10 perform calculations involving other redox systems given suitable data</p> |
| | Organic chemistry 29 An introduction to A Level organic | <p>29.1 Formulae, functional groups and the naming of organic compounds</p> <p>29.2 Characteristic organic reactions</p> <p>29.3 Shapes of aromatic organic molecules; σ and π bonds</p> <p>29.4 Isomerism: optical</p> |
| | 30 Hydrocarbons | 30.1 Arenes |
| | <p>31 Halogen compounds</p> <p>32 Hydroxy compounds</p> <p>33 Carboxylic acids and derivatives</p> | <p>31.1 Halogen compounds</p> <p>32.1 Alcohols</p> <p>32.2 Phenol</p> <p>33.1 Carboxylic acids</p> |

| S. No. | Chapter/Topic | Description |
|--------|--|---|
| | | 33.2 Esters 33.3 Acyl chlorides |
| | Nitrogen compounds Polymerisation 36 Organic synthesis | 34.1 Primary and secondary amines 34.2 Phenylamine and azo compounds 34.3 Amides 34.4 Amino acids 35.1 Condensation polymerization 35.2 Predicting the type of polymerization 35.3 Degradable polymers 36.1 Organic synthesis |
| | 37 Analytical techniques | Thin-layer chromatography 37.2 Gas / liquid chromatography 37.3 Carbon-13 NMR spectroscopy 37.4 Proton (1H) NMR spectroscopy |

FM
Subject Teacher

FM
Head of Department

/
Headmaster/Headmistress



Sadiq Public School

Syllabus

Class: H2

Subject: Business

Academic Session: 2021-2022

Book Recommended: BUSINESS BY PETER STIMPSON & ALASTAIR FARQUHARSON (3rd Edition)

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|------------------------------|---|
| 1 | Business and its environment | Business Structure, Size of business, External influences on business activity, External economic influences on business activity |
| 2 | People in organizations | Further human resource management, Organization structure, Business Communication |
| 3 | Marketing | Marketing planning, Globalization and International marketing |
| 4 | Operations Management | Capacity Utilization, Lean production and quality management, Project Management |
| 5 | Finance | Costs, Budgets, Contents of published accounts, Analysis of published accounts, Investment Appraisal |
| 6 | Strategic Management | What is Strategic management, Strategic Analysis, Strategic Choice, Strategic Implementation |
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Subject Teacher

Head of Department

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Headmaster/Headmistress



Sadiq Public School

Syllabus

Class: H2

Subject: Economics

Academic Session: 2021-2022

Books Recommended: Colin Bamford and Susan Grant Cambridge International AS and A level

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|---------------|--|
| 1 | Unit 6 | Basic economic ideas and resource allocation |
| 2 | Unit 7 | The price system and the micro economy |
| 3 | Unit 8 | Government microeconomic intervention |
| 4 | Unit 9 | The macro economy |
| 5 | Unit 10 | Government macro intervention |
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Subject Teacher

Head of Department

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Headmaster/Headmistress



Sadiq Public School

Syllabus

Class: H2

Subject: Mathematics

Academic Session: 2021-2022

Books Recommended: Pure Math 2 & 3 by Sue Pemberton, Julianne Hughes
Advance Level Statistics by Steve Doobs, Jane Miller and Julian Gilbey

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|---------------|------------------------------------|
| 01 | Chapter # 01 | Algebra |
| 02 | Chapter # 02 | Exponential & Logarithmic Function |
| 03 | Chapter # 03 | Trigonometry |
| 04 | Chapter # 04 | Differentiation |
| 05 | Chapter # 05 | Integration |
| 06 | Chapter # 06 | Numerical Solution of equations |
| 07 | Chapter # 07 | Further Algebra |
| 08 | Chapter # 08 | Further Calculus |
| 09 | Chapter # 09 | Vectors |
| 10 | Chapter # 10 | Differential Equation |
| 11 | Chapter # 11 | Complex Number |
| | Statistics | |
| 01 | Chapter # 01 | Representation Of Data |
| 02 | Chapter # 02 | Measure of Location |

| S. No. | Chapter/Topic | Description |
|-----------|---------------|---|
| 03 | Chapter # 03 | Measure of Spread |
| 04 | Chapter # 04 | Probability |
| 05 | Chapter # 05 | Permutation and Combination |
| 06 | Chapter # 06 | Probability Distribution |
| 07 | Chapter # 07 | The Binomial Distribution |
| 08 | Chapter # 08 | Expectation and Variance of a random variable |
| 09 | Chapter # 09 | The Normal Distribution |

Subject Teacher

Head of Department

_____/_____
Headmaster/Headmistress



SADIQ PUBLIC SCHOOL

SYLLABUS

Document No: SPS-QF-SBP-01
Issue No: 02
Issue Date: 14-05-2007
Revision No: 01
Revision Date: 22-07-2009

Class: H2

Subject: Physics

Academic Session: 2021-2022

Books Recommended: Pacific Physics A-level volume I and II

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|-------------------------|--|
| 01 | Motion in a circle | Angular velocity, Radian, centripetal acceleration, centripetal force |
| 02 | Gravitational Fields | Newton’s law of gravitation, gravitational field strength, gravitational potential |
| 03 | temperature | empirical and thermodynamic scale of temperature |
| 04 | ideal gas | kinetic theory of gases, ideal gas equation |
| 05 | Thermodynamics | specific heat capacity, specific latent heat of fusion/vaporization, 1 st law of thermodynamics |
| 06 | Oscillations | simple harmonic motion, damping, energy in simple harmonic motion. |
| 07 | electric field | frequency and amplitude modulation, attenuation of signal |
| 08 | capacitance | series and parallel combination of capacitor, energy stored in a capacitor |
| 09 | magnetic field | principal of magnet, magnetic field due to current, laws of induction, generator |
| 10 | alternating current | root mean square values, rectification, smoothing |
| 11 | Quantum physics | photo electric effect, dual nature of light, Energy levels in atoms and line spectra |
| 12 | Nuclear physics | nuclear binding energy radioactivity, radioactive decay. |
| 13 | Medical physics | Production and use of ultrasound, Production and use of X-rays, PET scanning |
| 14 | Astronomy and cosmology | Luminosity, radiant flux intensity, Wien’s displacement law, emission spectra, Hubble’s law. |

Subject Teacher

Head of Department

Headmaster/Headmistress



Sadiq Public School

Syllabus

Class: H2

Subject: Computer Science

Academic Session: 2021-2022

Books Recommended: Cambridge International AS & A Level Computer Science by David Watson and Helen Williams

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|---------------|--|
| 1 | Chapter 13 | Data Representation |
| 2 | Chapter 14 | Communication and Internet Technologies |
| 3 | Chapter 15 | Hardware |
| 4 | Chapter 16 | System Software and Virtual Machines |
| 5 | Chapter 17 | Security |
| 6 | Chapter 18 | Artificial Intelligence (AI) |
| 7 | Chapter 19 | Computational Thinking and Problem Solving |
| 8 | Chapter 20 | Further Programming |

Subject Teacher

Head of Department

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Sadiq Public School

Syllabus

Class: H2 Subject: Accounting

Academic Session: 2021-2022

Books Recommended: International AS & A Level Accounting by David Hopkins and Harold Randall (2nd Ed).

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|---------------|--|
| 1 | Ch. No. 20 | Manufacturing accounts |
| 2 | Ch No. 21 | Not-for profit organizations |
| 3 | Ch. No. 22 | Published company accounts |
| 4 | Ch. No. 23 | Statement of cash flows |
| 5 | Ch. No. 24 | Business purchase and mergers |
| 6 | Ch No. 25 | Consignment and joint venture accounts |
| 7 | Ch. No. 26 | Computerized accounting systems |
| 8 | Ch. No. 27 | Ratio analysis (A-Levels only) |
| 9 | Ch. No. 31 | Activity-based costing |
| 10 | Ch. No. 32 | Budgeting and budgetary control |
| 11 | Ch. No. 33 | Standard costing |
| 12 | Ch. No. 34 | Investment appraisal |
| 13 | | |

GY/MQL

Subject Teacher

Head of Department

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Headmaster/Headmistress



Sadiq Public School

Syllabus

Class: H2A/H2G

Subject: LAW

Academic Session: 2021-2022

Books Recommended: As and A level law by Hodder Education

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|----------------------|---|
| 1. | Elements of Contract | Offer,Acceptance,Intention,Capacity and Consideration |
| 2. | Terms of Contract | Types of terms, Status of terms and Exemption clauses |
| 3. | Vitiating Factors | Misrepresentation and Mistake |
| 4. | Remedies | Common Law and Equitable remedies |
| 5. | Duty of Care | Imposition of duty, breach of duty,causation,pure economic loss and nervous shock |
| 6. | OLA | Occupiers liability towards visitors and trespassers |
| 7. | Trespass | Trespass to land and person |
| 8. | Nuisance | Private nuisance and law on R v F |
| 9. | Vicarious liability | Employment relations |
| 10. | Defences | General defences under Tort |
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Subject Teacher

Head of Department

_____/_____
Headmaster/Headmistress



Sadiq Public School

Syllabus

Class: H2

Subject: Sociology

Academic Session: 2021-2022

Books Recommended: Cambridge International AS and A Level Sociology Course book by Chris Livesey.

Details of Syllabus

| S. No. | Chapter/Topic | Description |
|--------|--------------------|---|
| 1. | Education | Functionalist and Marxist perspective, How intelligence is defined and measured, Different perspectives on intelligence and educational achievement, Power and control in modernity and post modernity. |
| 2. | Global Development | Development and Inequality, Population growth and development, Different theories of development, The Economic, Political and Cultural dimensions of Globalization. |
| 3. | Media | Sociological perspective on media, Ownership and control of the media, Modernist and Postmodernist perspective on the role of media, Effects consequences and research of mass media. |
| 4. | Religion | Inclusive and Exclusive definition of religion, Religious movements, Theoretical perspective on religion, Different types of religious organizations, Secularization, Fundamentalism and Modernity. |
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Subject Teacher

Head of Department

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