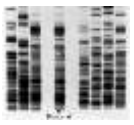
A-LEVEL BIOLOGY LEARNING JOURNEY

AQA

UXBRIDGE HIGH SCHOOL

EXAMS



Genetic Fingerprinting

Recombinant DNA Technology

Gene Therapy

Using Genome Projects

Gene Expression and Cancer

Regulation of transcription and translation

THE CONTROL OF GENE EXPRESSION

Alteration of the sequence of bases in DNA can alter the structure of proteins

Most of a cells DNA is not translated

Required Practical 12 - Investigation into the effect of a named environmental factor on the distribution of a given species

Conservation

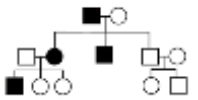
Adaptations

Sampling

Populations

GENETICS, POPULATIONS, EVOLUTION AND ECOSYSTEMS

Inheritance



Control of Blood Water Potential

Glucose in Urine

Blood Glucose Concentration

Homeostasis & Negative Feedback

Skeletal Muscles

Variation, Evolution & Speciation

Succession

Population Size

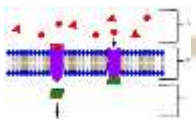
Required Practical 11 - Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown 'urine' sample

Required Practical 7 - Use of chromatography to investigate the pigments isolated from leaves of different plants, e.g. leaves from shade-tolerant and shade-intolerant plants or leaves of different colours

Nutrient Cycles

Fertilisers & Eutrophication

Required Practical 9 - Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled organisms



Animal Responses

Receptors

ENERGY TRANSFERS IN AND BETWEEN ORGANISMS

ORGANISMS RESPOND TO CHANGES IN THEIR INTERNAL AND EXTERNAL ENVIRONMENTS

Energy Transfer in Ecosystems

Photosynthesis

Respiration

Farming Practices & Production

Required Practical 8 - Investigation into the effect of a named factor on the rate of dehydrogenase activity in extracts of chloroplasts

Survival & Response

Control of Heart Rate

Nerve Impulses

Synaptic Transmission

Required Practical 10 - Investigation into the effect of an environmental variable on the movement of an animal, using either a choice chamber or a maze

Required Practical 6 - . Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth

Year 13

Investigating biodiversity

Species and taxonomy

Genetic Diversity can arise as a result of mutation during meiosis

GENETIC INFORMATION, VARIATION AND RELATIONSHIPS BETWEEN ORGANISMS

DNA, Genes and Chromosomes

Haemoglobin

Mass transport in plants

Digestion and Absorption

DNA and Protein Synthesis

Surface area to volume ratio

Genetic Diversity and Adaptation

Biodiversity within a community

Required Practical 3 - Production of a dilution series of a solute to produce a calibration curve, with which to identify the water potential of plant tissue

Required Practical 2- Preparation of stained squashes of cells from plant root tips; setup and use of an optical microscope to identify the stages of mitosis in these stained squashes and calculation of a mitotic index

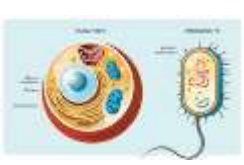
All Cells arise from other cells

CELLS

ORGANISMS EXCHANGE SUBSTANCES WITH THEIR ENVIRONMENTS

Required Practical 5 - Dissection of animal or plant gas exchange or mass transport system or of organ within such a system

Structure of prokaryotic cells and viruses

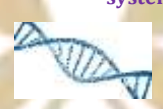


Structure of eukaryotic cells

Methods of studying cells

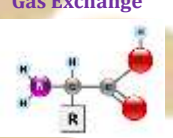
Required Practical 4 - Investigation into the effect of a named variable on the permeability of cell-surface membranes

Cell recognition and the immune system



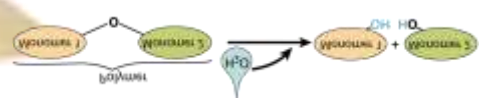
Structure of DNA & RNA

Gas Exchange



General Properties of Proteins

Mass transport in animals



Monomers & Polymers

Inorganic Ions

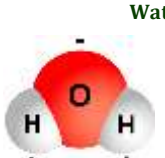
ATP

BIOLOGICAL MOLECULES

Year 12

Required Practical 1 - Investigation into the effect of a named variable on the rate of an enzyme-controlled reaction

Water

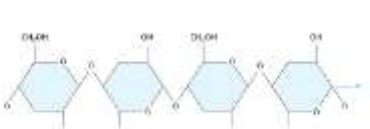


DNA Replication

Many Proteins are Enzymes

Lipids

Carbohydrates



A-LEVEL CHEMISTRY LEARNING JOURNEY

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EXAMS

Chromatography

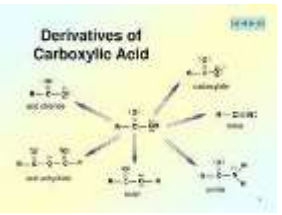
Required Practical 12 - Separation of species by thin-layer chromatography

Structure determination including NMR

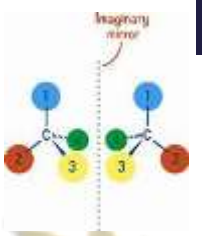
Organic synthesis

Amines

Carboxylic acids and derivatives



Nomenclature and isomerism



ORGANIC CHEMISTRY

Required Practical 11 - Carry out simple test-tube reactions to identify transition metal ions in aqueous solution

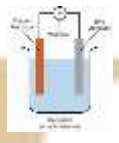
Amino acids, proteins and DNA

Polymers

Aromatic chemistry

Aldehydes and ketones

Reactions of ions in aqueous solution



Required Practical 7 - Measuring the rate of reaction:
- by an initial rate method
- by a continuous monitoring method

Electrode Potentials and electrochemical cells

Acids and Bases

Periodicity

Required Practical 10 - Preparation of:
a pure organic solid and test of its purity
a pure organic liquid

Transition metals

PHYSICAL CHEMISTRY

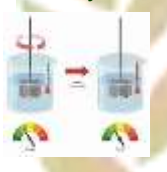
INORGANIC CHEMISTRY

Rate Equations

Equilibrium constant

Kinetics

Thermodynamics



Required Practical 8- Measuring the EMF of an electrochemical cell

Required Practical 6 - Tests for alcohol, aldehyde, alkene and carboxylic acid

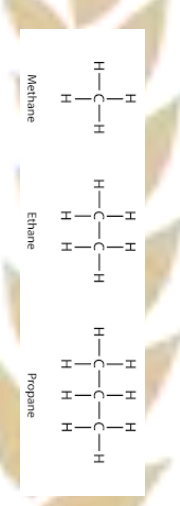
Required Practical 5 - Distillation of a product from a reaction

Required Practical 9 - Investigate how ph changes when a weak acid reacts with a strong base and when a strong acid reacts with a weak base

Year 13

Organic Analysis

Alkanes



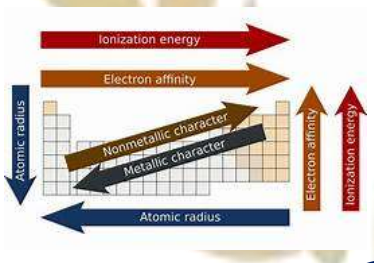
ORGANIC CHEMISTRY

Alcohols

Alkenes

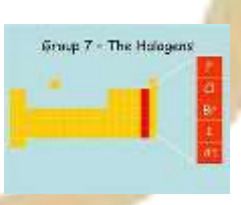
Halogenalkanes

Introduction to organic chemistry



Periodicity

Required Practical 3 - Investigation of how the rate of a reaction changes with temperature

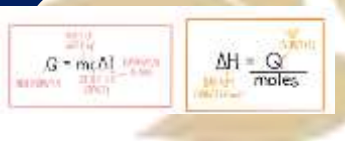


Group 7, the halogens

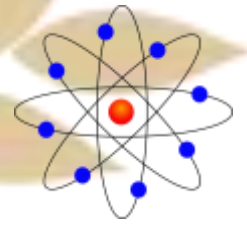
Required Practical 4 - Carry out simple test-tube reactions to identify:
cations – Group 2, NH_4^+
anions – Group 7 (halide ions), OH^-, CO_3^{2-}, SO_4^{2-}

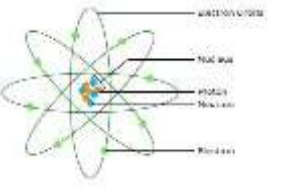
INORGANIC CHEMISTRY

Required Practical 2- Measurement of an enthalpy change



Group 2, the alkaline earth metals





Oxidation, reduction and redox equations

Chemical equilibria

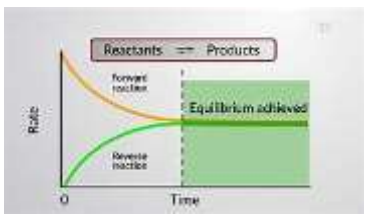
Energetics

Required Practical 1 - Make up a volumetric solution and carry out a simple acid–base titration

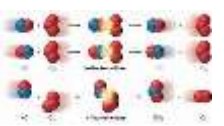
Atomic structure

Year 12

PHYSICAL CHEMISTRY



Kinetics



Bonding

Amount of substance

A-LEVEL PHYSICS LEARNING JOURNEY

AQA

UXBRIDGE HIGH SCHOOL

EXAMS

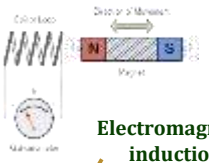
ASTROPHYSICS

Cosmology

Telescope

Nuclear energy

Required Practical 12 - Investigation of the inverse-square law for gamma radiation



Electromagnetic induction

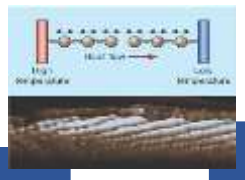
Surveying the stars

NUCLEAR PHYSICS

Radioactivity

Magnetic fields

Required Practical 11 - Investigate, using a search coil and oscilloscope, the effect on magnetic flux linkage of varying the angle between a search coil and magnetic field direction



Required Practical 7 - Investigation into simple harmonic motion using a mass-spring system and a simple pendulum

Required Practical 8 - Investigation of Boyle's (constant temperature) law and Charles' (constant pressure) law for a gas

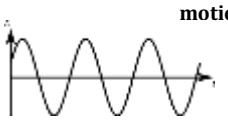
Required Practical 10 - Investigate how the force on a wire varies with flux density, current and length of wire using a top pan balance

Thermal Physics

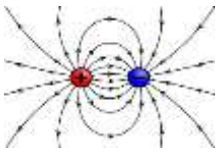
Capacitors

Electric fields

Simple harmonic motion



FIELDS

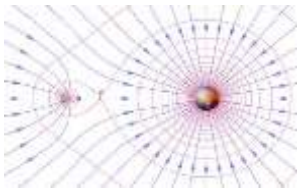


FURTHER MECHANICS

Gases

Gravitational fields

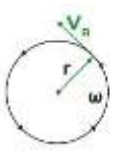
Motion in a circle



Required Practical 9 - Investigation of the charge and discharge of capacitors. Analysis techniques should include log-linear plotting leading to a determination of the time constant RC

$V_r = r \cdot \omega$

Required Practical 5 - Determination of resistivity of a wire using a micrometer, ammeter and voltmeter



Year 13

Electric current

Materials

Force and momentum

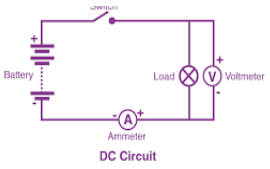
ELECTRICITY

MECHANICS AND MATERIALS

Required Practical 4 - Determination of the young modulus by a simple method

Required Practical 6 - Investigation of the emf and internal resistance of electric cells and batteries by measuring the variation of the terminal pd of the cell with current in it

DC circuits

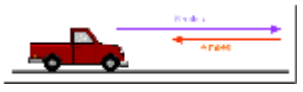


DC Circuit

Work, energy and power

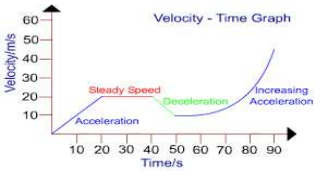
Newton's laws of motion

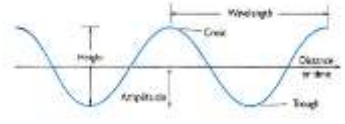
Required Practical 3 - Determination of g by a free-fall method



Forces in equilibrium

On the move – speed, velocity, motion graphs





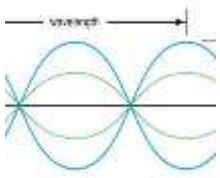
Wave properties

WAVES AND OPTICS

Required Practical 1 - Investigation into the variation of the frequency of stationary waves on a string with length, tension and mass per unit length of the string

Optics including wave properties

Required Practical 2 - Investigation of interference effects to include the Young's slit experiment and interference by a diffraction grating



Matter and radiation

PARTICLES AND RADIATION

Year 12

Quantum phenomena

Quarks and leptons