A-LEVEL BIOLOGY LEARNING JOURNEY

EXAMS

Year 13

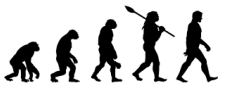
THE CONTROL OF GENE EXPRESSION

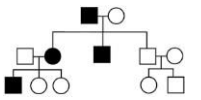
- Genetic Fingerprinting
- Recombinant DNA Technology
- Using Genome Projects
- Gene Expression and Cancer
- Regulation of transcription and translation
- Gene Therapy
- Alteration of the sequence of bases in DNA can alter the structure of proteins

GENETICS, POPULATIONS, EVOLUTION AND ECOSYSTEMS

- Conservation
- Adaptations
- Sampling
- Populations
- Inheritance
- Succession
- Population Size
- Variation, Evolution & Speciation

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





ENERGY TRANSFERS IN AND BEWTEEN ORGANISMS

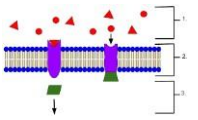
- Nutrient Cycles
- Fertilisers & Eutrophication
- Most of a cells DNA is not translated

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

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

ORGANISMS RESPOND TO CHANGES IN THEIR INTERNAL AND EXTERNAL ENVIRONMENTS

- Animal Responses
- Receptors
- Control of Blood Water Potential
- Glucose in Urine
- Blood Glucose Concentration
- Homeostasis & Negative Feedback
- Skeletal Muscles



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

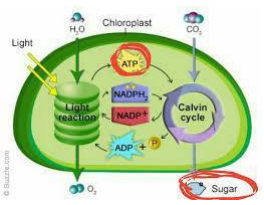
Year 12

GENETIC INFORMATION, VARIATION AND RELATIONSHIPS BETWEEN ORGANISMS

- Energy Transfer in Ecosystems
- Photosynthesis
- Respiration
- Farming Practices & Production
- Survival & Response
- Control of Heart Rate
- Nerve Impulses
- Synaptic Transmission
- Investigating biodiversity
- Species and taxonomy
- Genetic Diversity can arise as a result of mutation during meiosis
- DNA, Genes and Chromosomes

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

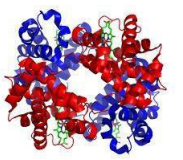
Required Practical 6 - . Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth



ORGANISMS EXCHANGE SUBSTANCES WITH THEIR ENVIRONMENTS

- Biodiversity within a community
- Genetic Diversity and Adaptation
- DNA and Protein synthesis
- Mass transport in plants
- Surface area to volume ratio
- Digestion and Absorption
- Haemoglobin

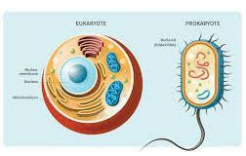
Required Practical 3 - Production of a dilution series of a solute to produce a calibration curve with which to identify the water potential of plant tissue



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

CELLS

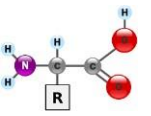
- All Cells arise from other cells
- Structure of prokaryotic cells and viruses
- Structure of eukaryotic cells
- Methods of studying cells

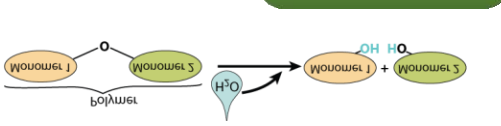


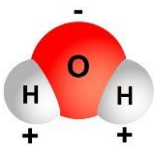
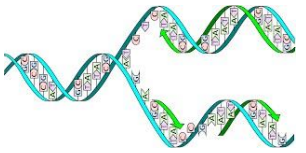
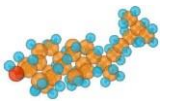
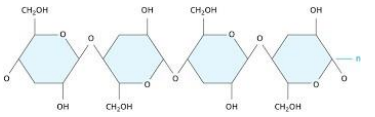
BIOLOGICAL MOLECULES

- Inorganic Ions
- ATP
- Structure of DNA & RNA
- General Properties of Proteins
- Monomers & Polymers
- Water
- DNA Replication
- Many Proteins are Enzymes
- Lipids
- Carbohydrates

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





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

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