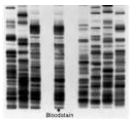
# A-LEVEL BIOLOGY LEARNING JOURNEY

EXAMS



Genetic Fingerprinting

Recombinant DNA Technology

Gene Therapy

Using Genome Projects

Gene Expression and Cancer

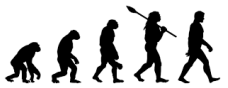
Regulation of transcription and translation

## 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



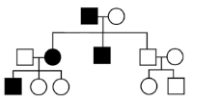
Conservation

Adaptations

Sampling

Populations

Inheritance



## GENETICS, POPULATIONS, EVOLUTION AND ECOSYSTEMS

Variation, Evolution & Speciation

Succession

Population Size

Control of Blood Water Potential

Glucose in Urine

Blood Glucose Concentration

Homeostasis & Negative Feedback

Skeletal Muscles

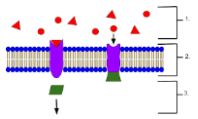
Required Practical 11 - Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown 'urine' sample

Required Practical 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 BEWTEEN ORGANISMS

## ORGANISMS RESPOND TO CHANGES IN THEIR INTERNAL AND EXTERNAL ENVIRONMENTS

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

Energy Transfer in Ecosystems

Photosynthesis

Farming Practices & Production

Respiration

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

Survival & Response

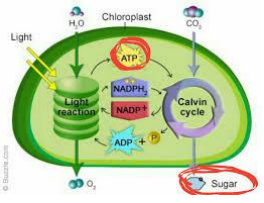
Control of Heart Rate

Nerve Impulses

Synaptic Transmission

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

Year 13



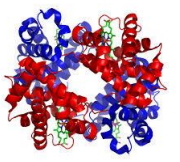

## GENETIC INFORMATION, VARIATION AND RELATIONSHIPS BETWEEN ORGANISMS

Investigating biodiversity

Species and taxonomy

Genetic Diversity can arise as a result of mutation during meiosis

DNA, Genes and Chromosomes



Biodiversity within a community

Genetic Diversity and Adaptation

DNA and Protein synthesis

Mass transport in plants

Digestion and Absorption

Surface area to volume ratio

Haemoglobin

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

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

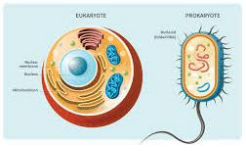
All Cells arise from other cells

## 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



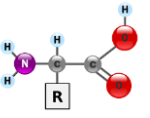

Structure of eukaryotic cells

Methods of studying cells

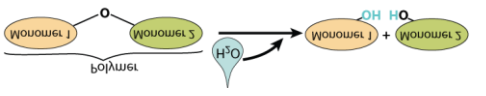
Required Practical 4 - Investigation into the effect of a named variable on the permeability of cell-surface membranes

Cell recognition and the immune system

Gas Exchange




Mass transport in animals




Inorganic Ions

ATP

Structure of DNA & RNA

General Properties of Proteins

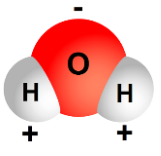
Monomers & Polymers

## BIOLOGICAL MOLECULES

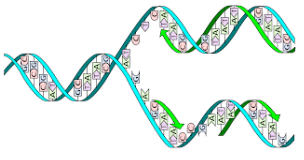
Year 12

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

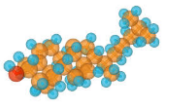
Water




DNA Replication

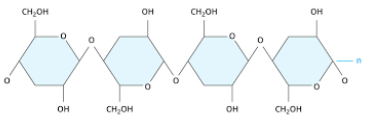


Many Proteins are Enzymes



Lipids

Carbohydrates



TEACHER 1

TEACHER 2