

UNITS OF STUDY: BREAKDOWN

BIOCHEMISTRY

- INTRODUCTION TO BASIC CHEMISTRY
- CARBOHYDRATES
- LIPIDS
- NUCLEIC ACIDS
- PROTEINS
- ENZYMES

CELL MEMBRANE STRUCTURE AND FUNCTION

- PHOSPHOLIPIDS
- PROPERTIES OF WATER
- POLARITY
- AMPHIPHATHIC MOLECULES

CELLULAR TRANSPORT

- CONCENTRATION GRADIENTS
- PASSIVE TRANSPORT
 - DIFFUSION
 - FACILITATED DIFFUSION
 - OSMOSIS
 - TONICITY PROBLEMS
- ACTIVE TRANSPORT
 - SODIUM-POTASSIUM PUMP

BIOENERGETICS

- PHOTOSYNTHESIS
 - PLANT STRUCTURE AND FUNCTION
 - CHLOROPLAST ANATOMY
 - PHOTOSYNTHESIS EQUATION
 - RATES OF PHOTOSYNTHESIS
- CELLULAR RESPIRATION
 - ANAEROBIC RESPIRATION
 - GLYCOLYSIS
 - LACTIC ACID PATHWAY
 - ALCOHOLIC FERMENTATION
 - AEROBIC RESPIRATION
 - MITOCHONDRIA ANATOMY
 - AEROBIC RESP. EQUATION
 - RATES OF RESPIRATION

CELLULAR STRUCTURES

- PROKARYOTIC CELLS
 - STRUCTURE AND FUNCTION
- EUKARYOTIC CELLS
 - STRUCTURE AND FUNCTION
 - ORGANELLES!!!!

DNA STRUCTURE AND FUNCTION

- HISTORY RECAP (DRAMA)
- BIOCHEMISTRY REVIEW
- MODEL BUILDING
- LEADING AND LAGGING STRANDS

DNA REPLICATION

- CELL CYCLE (INTERPHASE ONLY)
- FOUR ENZYMES AND FUNCTIONS
- OKAZAKI FRAGMENTS
- SEMI-CONSERVATIVE
- ERRORS IN REPLICATION

MITOSIS

- CELL CYCLE
- INTERPHASE
- FOUR PARTS OF THE M-PHASE
- ERRORS IN MITOTIC DIVISION

ASEXUAL REPRODUCTION

- MITOSIS
- BINARY FISSION
- FRAGMENTATION/REGENERATION
- VEGETATIVE PROPAGATION
- BUDDING
- SPORULATION
- PARTHENOGENESIS

SEXUAL REPRODUCTION

- GAMETES
- VARIATION
- SECONDARY SEX CHARACTERISTICS
- OOGENESIS
- SPERMATOGENESIS
- PROPHASE ONE
- SYNAPSIS/CROSSING OVER

BASIC GENETICS

- GREGOR MENDEL
- LAW OF SEGREGATION
- LAW OF INDEPENDENT ASSORTMENT
- RULE OF DOMINANCE
- PUNNETT SQUARES
- DOMINANT V RECESSIVE ALLELES
- HOMO V HETEROZYGOUS

NON-MENDELIAN GENETICS

- CO-DOMINANCE
- INCOMPLETE DOMINANCE
- SEX-LINKED TRAITS
- MULTIPLE ALLELES
- DIHYBRID PUNNETT SQUARES
- POLYGENIC TRAITS
- EPIGENETIC TRAITS
- LETHAL ALLELES

HUMAN GENETICS

- KARYOTYPE ANALYSIS
- PEDIGREE ANALYSIS
- HUMAN GENETIC DISORDERS
- HUMAN CHROMOSOMAL DISORDERS
- AUTOSOMAL V CHROMOSOMAL

BIOTECHNOLOGY

- GENETIC ENGINEERING
 - BACTERIAL TRANSFORMATION
 - GMO (FOODS)
- CLONING
- GEL ELECTROPHORESIS
- RESTRICTION ENZYMES
- GENE THERAPY
- HUMAN GENOME PROJECT
- POLYMERASE CHAIN REACTION
- STEM CELL RESEARCH

UNITS OF STUDY: BREAKDOWN

EVOLUTION

- CHARLES DARWIN
 - HISTORY
 - HMS BEAGLE
 - DARWIN'S LESSONS
 - LAMARCK
 - HUTTON & LYELL
 - MALTHUS
 - ON THE ORIGIN OF SPECIES
 - ARTIFICIAL SELECTION
 - NATURAL SELECTION
- NATURAL SELECTION
 - SELECTING AGENT
 - ADAPTIVE RADIATION
 - "SURVIVAL OF THE FITTEST"
 - ALLELIC FREQUENCY
- MODES OF NATURAL SELECTION
 - DISRUPTIVE SELECTION
 - STABILIZING SELECTION
 - DIRECTIONAL SELECTION
- SPECIATION
- GENETIC DRIFT
- FOUNDER EFFECT
- GENE POOL

EVIDENCES OF EVOLUTION

- KNOWN BY DARWIN
- UNKNOWN BY DARWIN

SPONTANEOUS GENERATION

- REDI, PASTEUR
- OPARIN
- MILLER & UREY
- MARGULIS

HISTORY OF EARTH

- ERAS OF TIME
- RATES OF EVOLUTION
- RADIOMETRIC DATING
- RELATIVE DATING

PATTERNS AND RATES OF EVOLUTION

- CONVERGENT EVOLUTION
- DIVERGENT EVOLUTION
- GRADUALISM
- PUNCTUATED EQUILIBRIUM

ADAPTATION

- STRUCTURAL ADAPTATION
- BEHAVIORAL ADAPTATION

TAXONOMY

- ARISTOTLE
- LINNAEUS
- DICHOTOMOUS KEY
- CLADOGRAM
- 6-KINGDOM SYSTEM
- DOMAINS OF LIFE

REPRESENTATIVE ORGANISMS

- PROTISTS
- PLANTS
- ANIMALS

ECOLOGY

- ECOLOGY BASICS
- LEVELS OF ORGANIZATION
- BIOMES
- ECOLOGICAL SUCCESSION
- ENERGY FLOW
 - PRODUCERS V CONSUMERS
- TYPES OF AUTOTROPHS
- TYPES OF CONSUMERS
- FOOD CHAINS V FOOD WEBS
- TROPHIC LEVELS
- ECOLOGICAL PYRAMIDS
- HABITAT
- NICHE
- COMMUNITY INTERACTIONS
 - COMPETITION
 - PREDATION
 - SYMBIOSIS
- MATERIAL CYCLES
 - CARBON CYCLE
 - NITROGEN CYCLE
 - WATER CYCLE
- POPULATION ECOLOGY
 - J & S SHAPED CURVES
 - CARRYING CAPACITY
 - LIMITING FACTORS
 - PREDATOR-PREY GRAPH
 - DEMOGRAPHY
 - AGE-STRUCTURE DIAGRAMS

HUMAN IMPACT ON THE ENVIRONMENT

- **LOTS OF HUMAN IMPACTS**
- **LOTS OF SOLUTIONS**

STERNGRR

- SYNTHESIS
- TRANSPORT
- EXCRETION
- REGULATION
- NUTRITION
- GROWTH & DEVELOPMENT
- RESPIRATION
- REPRODUCTION

****OVERARCHING THEME OF THE COURSE****