| ***Standard*** | ***Week*** | ***Units*** | ***Concepts*** | ***Vocabulary*** |
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| **A. Exploring and Defining the Fundamental Unifying Concepts, Organization, and Inquiry Techniques underlying the Science of Biology**  ASIM Lab A1: Rule  ASIM Lab B1a: Toilet Paper Inquiry  ASIM Lab C7: Cell Size | Week 1 | A.1 Scientific Inquiry  A.3 Science in Practice | * Safety rules * Safety symbols * Lab equipment * Scientific method * Experimental design * Variables * Microscopes * Graphing | |  |  |  | | --- | --- | --- | | Scientific method  Observation  Hypothesis  Prediction  Estimation  Variable  Independent variable  Dependent variable  Control group  Experiment  Data  Qualitative data  Quantitative data | Sample size  Inference  Conclusion  Peer review  Honesty  Bias  Line graph  Bar graph  Pie chart  Scatter plot  Correlation  Compound light microscope  Resolution | Electron microscope  Theory  Scientific law  Natural phenomena  Technology  Validity  Reliability  Fabrication  Falsification  Plagiarism  Suppression  Pure science  Applied science | |
| Week 2 | A.2 Mathematics and Measurement in Science | * SI units * Analyze experiments * Formulate graphs | |  |  |  | | --- | --- | --- | | Metric system  Base unit  mean | Median  Mode  range | Exponential model  Logistic model | |
| Week 2 Cont. | A.4 Foundations | * Characteristics of life * Levels of organization * (from atom to organism) | |  |  |  | | --- | --- | --- | | Metabolism  Reproduction  Homeostasis  Stimuli  Growth  Development (differentiation)  Viruses | Atom  Molecule  Organelle  Cell  Organ  Organ system  Organism | Population  Community  Ecosystem  Biome  Biosphere | |
| Week 3/4 | A.5 Biochemistry | * Atoms * Ions * Chemical bonds * Properties of water * Organic compounds * Chemical reactions * (photosynthesis, fermentation, and cellular respiration introduction) * pH scale * acids and bases * enzymes * ATP introduction | |  |  |  | | --- | --- | --- | | Proton  Neutron  Electron  Electron cloud  Ionic bonds  Covalent bonds  Isotopes (carbon 12, 13, and 14)  Polar  Non-polar  Organic  Inorganic  Cellular respiration (including formula)  Photosynthesis | Products  Reactants  Hydrogen bond  pH scale  ions  H+ ions(hydrogen ion)  OH- ions (hydroxide ion)  buffers  Carbohydrates  Lipids  Proteins  Nucleic acid  Hydrolysis  Condensation reaction | Enzymes  Activation energy  Substrate  Induced fit model  Monosaccharide  Disaccharide  Polysaccharide  Amino acid  Dipeptide  Polypeptide  Fatty acids  Glycerol  Glycerides  Hydroxyl group | |
| **B. Investigating Life Processes at the Cellular Level and Understanding Both How These Processes Work and How They Are Maintained and Regulated**  ASIM Lab C2a: Osmosis in Onion Cells  ASIM Lab C5: Comparing Plants and Animals | Weeks5/6 | B.1 Cells | * Prokaryotic vs. Eukaryotic * Cell membrane and transport * Cell organelles: structure and function * Plant vs animal cells (how they are alike and different) * ATP structure and function * Anaerobic/aerobic * respiration * Mitosis | |  |  |  | | --- | --- | --- | | Prokaryote  Eukaryote  Endoplasmic reticulum (RER, SER)  Golgi body  Ribosomes  Mitochondria  Cytoskeleton (microfilaments, microtubules)  Cilia  Flagella  Pseudopodia  Motile  Lysosomes  Centrioles  Cell membrane  Cell wall  Vacuoles  Centrioles  Introduce Paramecium: (contractile vacuole)  DNA  Nucleus | Nuclear envelope  Nuclear pores  Nucleolus  Chloroplast  Hypertonic  Hypotonic  Isotonic  Osmosis  Diffusion  Facilitated diffusion  Concentration gradient  Active transport  Passive transport  Channel proteins  Sodium potassium pump  Endocytosis  Exocytosis  Phagocytosis  Pinocytosis  Fermentation  Aerobic  Anaerobic | Lactic acid  Pyruvic acid  NADH  Acetyl CoA  FADH2  Glycolysis  Krebs cycle (intro)  Electron transport chain (intro)  Mitosis  Autosomal (somatic cells)  Cell cycle  Genes  Chromosomes  Chromatin  Prophase  Metaphase  Anaphase  Telophase  Cytokinesis  Haploid  Diploid | |
| C. Delving Into Heredity by Investigating How Genetic  **Structures and Processes Provide the Mechanism for Continuity and Variety Among Organisms**  ASIM Lab D12: Disorder Detective  ASIM Lab D14: Dragon Detectives | Weeks 7/8 | C.1 Genetics | * DNA, RNA and Protein synthesis * Meiosis * Gregor Mendel | |  |  |  | | --- | --- | --- | | Griffith’s experiments  Hershey Chase Experiment  Bacteriophages  Watson and Crick  Franklin and Wilkin  DNA  Nitrogen base  RNA  mRNA  tRNA  Transcription  Translation  Codon  Anticodon  introns  exons  RNA polymerase  Promoter  Termination signal | Meiosis  Crossing over  Prophase I  Metaphase I  Anaphase I  Telophase I  Prophase II  Metaphase II  Anaphase II  Telophase II  Sexual reproduction  Genetic variation  Alleles  Dominant  Recessive  Genotype  Phenotype  Mendel’s law of segregation  Mendel’s law of independent assortment | Mendel’s law of  Dominance  Incomplete dominance  Co-dominance  Sex-linked traits  (X-linked)  Punnett square  Homozygous  Heterozygous  carrier  Pedigree  Mutations  Gene mutations  Chromosome mutations  Frame-shift mutations  Cystic fibrosis  Trisomy  Down Syndrome  Albinism  Dwarfism  Color Blindness | |