Biology Sem 1

1. Scientific Knowledge and Chemistry of Life
   1. Scientific Inquiry
      1. Instruction
         1. How do scientists ask and answer questions about the natural world?
      2. Assignment
         1. Practice applying the scientific method.
      3. Assignment
         1. Read about the scientific method.
      4. Quiz
   2. Research in Science
      1. Instruction
         1. How can referencing multiple sources bring validity to science research?
      2. Assignment
         1. Write about experimental error and bias.
      3. Assignment
         1. Practice what you have learned about research in science.
      4. Quiz
   3. Hypotheses, Theories, and Laws
      1. Instruction
         1. What is the relationship between observations, hypotheses, theories, and laws?
      2. Assignment
         1. Practice hypotheses, theories, and laws.
      3. Quiz
   4. Collecting and Organizing Data
      1. Instruction
         1. What is the purpose of collecting and organizing data in scientific investigations?
      2. Assignment
         1. Read an article about water quality in the United States.
      3. Quiz
   5. Analyzing Data and Drawing Conclusions
      1. Instruction
         1. How can data be used to draw inferences?
      2. Assignment
         1. Read the article “Graphing Practice.”
      3. Instruction
         1. How can data be used to draw inferences?
      4. Assignment
         1. Practice analyzing data and developing conclusions.
      5. Quiz
   6. Evaluating Scientific Explanations
      1. Instruction
         1. How are scientific explanations evaluated?
      2. Assignment
         1. Read “Who Built the Pyramids?”
      3. Quiz
   7. Technological Design
      1. Instruction
         1. What is technological design?
      2. Assignment
         1. Evaluate technological designs.
      3. Quiz
   8. Carbohydrates
      1. Instruction
         1. What role do carbohydrates play in living organisms?
      2. Assignment
         1. Explore diabetes.
      3. Quiz
   9. Lipids
      1. Instruction
         1. What are the structures and functions of lipids in living organisms?
      2. Assignment
         1. Practice what you have learned about lipids.
      3. Quiz
   10. Proteins and Nucleic Acids
       1. Instruction
          1. What are the structures and functions of proteins and nucleic acids in living organisms?
       2. Assignment
          1. Practice what you have learned about proteins and nucleic acids.
       3. Quiz
   11. Catalysts
       1. Instruction
          1. What effect do enzymes have on biochemical reactions?
       2. Assignment
          1. Read about the structure and function of enzymes.
       3. Quiz
   12. **Unit Test - (Must be taken in Person)**
       1. Unit Test Review
2. Cell Structures and Reproduction
   1. Cell Theory
      1. Instruction
         1. How does cell theory explain the importance of cells to living organisms?
      2. Assignment
         1. Explore microscopes and cell theory.
      3. Quiz
   2. The Function of Organelles
      1. Instruction
         1. What are organelles, and what specific cellular functions do they perform?
      2. Assignment
         1. Practice labeling the organelles of a cell and describing their functions.
      3. Quiz
   3. Prokaryotic and Eukaryotic Cells
      1. Instruction
         1. What are the similarities and differences of prokaryotic and eukaryotic cells?
      2. Assignment
         1. Read about cells.
      3. Quiz
   4. Animal and Plant Cells
      1. Instruction
         1. What are the similarities and differences between animal and plant cells?
      2. Assignment
         1. Practice identifying animal and plant cell organelles.
      3. Quiz
   5. Cell Homeostasis
      1. Instruction
         1. How does a cell maintain homeostasis?
      2. Assignment
         1. Explore cellular transport.
      3. Quiz
   6. Cell Cycle
      1. Instruction
         1. What is the role of the cell cycle in the growth and development of organisms?
      2. Assignment
         1. Practice identifying the stages of the cell cycle.
      3. Quiz
   7. Meiosis
      1. Instruction
         1. How does meiosis allow for variation and sexual reproduction in some organisms?
      2. Assignment
         1. Explore meiosis and genetic recombination.
      3. Quiz
   8. Asexual and Sexual Reproduction
      1. Instruction
         1. How are asexual and sexual reproduction similar and different?
      2. Assignment
         1. Practice differentiating asexual and sexual reproduction.
      3. Quiz
   9. Cell Differentiation and Specialization
      1. Instruction
         1. How are cells differentiated for specific functions?
      2. Assignment
         1. Explore cell differentiation and specialization.
      3. Assignment
         1. Practice what you have learned about cell differentiation and specialization.
      4. Quiz
   10. **Unit Test - (Must be taken in Person)**
       1. Unit Test Review
3. Cellular Energy
   1. Light Dependent Reactions in Photosynthesis
      1. Instruction
         1. How do plants get the energy they need to survive?
      2. Assignment
         1. Practice what you have learned about the light-dependent reactions of photosynthesis.
      3. Quiz
   2. Light Independent Reactions in Photosynthesis
      1. Instruction
         1. How are sugars made during photosynthesis?
      2. Assignment
         1. Practice what you know about light-independent reactions in photosynthesis.
      3. Quiz
   3. Cellular Respiration
      1. Instruction
         1. What is the purpose of cellular respiration? How does it occur?
      2. Assignment
         1. Practice identifying cellular respiration.
      3. Quiz
   4. DNA and Protein Synthesis
      * 1. Genetic Code
      1. Instruction
         1. How was the genetic code discovered and what role does it play in genetics today?
      2. Assignment
         1. Explore genes and forensic DNA.
      3. Quiz
   5. DNA and RNA Structure
      1. Instruction
         1. What are similarities and differences between the structures of DNA and RNA?
      2. Assignment
         1. Read about the discovery of DNA structure and types of RNA.
      3. Quiz
   6. Chromosomes
      1. Instruction
         1. What is the purpose of a chromosome?
      2. Assignment
         1. Explore chromosomes and chromosomal disorders.
      3. Quiz
   7. Protein Synthesis
      1. Instruction
         1. What is the purpose of proteins, and how are they synthesized?
      2. Assignment
         1. Explore protein synthesis.
      3. Quiz
   8. Lab: Building Proteins from RNA
      1. Instruction
         1. How are proteins built using the information provided by a molecule of RNA?
      2. Virtual Lab
         1. Explore the process of building proteins from the information carried by RNA.
      3. Assignment: Reflect on the Lab
         1. Reflect on the laboratory experiment.
         2. DNA Mutations
      4. Instruction
         1. What are the causes and effects of DNA mutations?
      5. Assignment
         1. Read about disorders associated with DNA mutations.
      6. Quiz
   9. **Unit Test - (Must be taken in Person)**
      1. Unit Test Review
4. Genetics and Heredity
   1. Introduction to Genetics
      1. Instruction
         1. How has the study of genetics shaped our understanding of heredity?
      2. Assignment
         1. Practice Mendelian crosses.
      3. Quiz
   2. Laws of Inheritance
      1. Instruction
         1. How are traits passed from parents to offspring?
      2. Assignment
         1. Practice the laws of inheritance.
      3. Quiz
   3. Probability of Inheritance
      1. Instruction
         1. How can inheritance be predicted?
      2. Assignment
         1. Practice Punnett squares.
      3. Quiz
   4. Lab: Mouse Genetics (One Trait)
      1. Instruction
         1. What is the effect of the genes of the parental mice on the fur color of the offspring mice?
      2. Virtual Lab
         1. Explore the relationship between genotype and phenotype with a virtual experiment.
      3. Assignment: Reflect on the Lab
         1. Reflect on the laboratory experiment.
   5. Lab: Mouse Genetics (Two Traits)
      1. Instruction
         1. What is the effect of the inheritance of one trait on the inheritance of a second trait?
      2. Virtual Lab
         1. Explore the two traits by performing a virtual experiment.
      3. Assignment: Reflect on the Lab
         1. Reflect on the laboratory experiment.
         2. Non-Mendelian Inheritance
      4. Instruction
         1. What other modes of inheritance are seen in organisms?
      5. Assignment
         1. Practice using Punnett squares.
      6. Quiz
   6. Sex-linked Inheritance
      1. Instruction
         1. How are sex-linked traits determined?
      2. Assignment
         1. Read about sex-linked inheritance and practice pedigrees.
      3. Quiz
   7. Applications of DNA Technology
      1. Instruction
         1. How has DNA technology led to advancements in forensics, medicine, and agriculture?
      2. Assignment
         1. Write about applications of DNA technology.
      3. Assignment
         1. Practice what you have learned about the applications of DNA technology.
      4. Quiz
   8. Consequences of DNA Technology
      1. Instruction
         1. How can DNA technology affect our society?
      2. Assignment
         1. Write about the consequences of using DNA technology.
      3. Quiz
   9. **Unit Test - (Must be taken in Person)**
      1. Unit Test Review
5. Cumulative Exam - (Must be taken in Person)
   1. Cumulative Exam Review