Physics Sem 2

1. Harmonic Motion and Sound Waves
   1. Simple Harmonic Motion
      1. Instruction
         1. What affects simple harmonic motion?
      2. Assignment
         1. Solve problems involving simple harmonic motion.
      3. Quiz
   2. Introduction to Waves
      1. Instruction
         1. How are the various types of waves similar and different?
      2. Assignment
         1. Describe the various types of waves.
      3. Quiz
   3. Wave Properties
      1. Instruction
         1. How are the properties of waves related?
      2. Assignment
         1. Demonstrate relationships between properties of waves.
      3. Quiz
   4. Wave Interactions
      1. Instruction
         1. How do waves interact with objects and other waves?
      2. Assignment
         1. Review wave interactions.
      3. Quiz
   5. Sound Waves
      1. Instruction
         1. How are sound waves different from other waves?
      2. Assignment
         1. Describe sound waves.
      3. Assignment
         1. Read about sound waves.
      4. Quiz
   6. Properties of Sound Waves
      1. Instruction
         1. What are the properties of sound waves?
      2. Assignment
         1. Describe the properties of sound.
      3. Quiz
   7. Radio Waves and Applications
      1. Instruction
         1. How are radio waves used in everyday applications?
      2. Assignment
         1. Describe how radio waves are used in everyday applications.
      3. Quiz
   8. **Unit Test - (Must be taken in Person)**
      1. Unit Test Review
2. Electromagnetic Waves
   * + 1. Electromagnetic Waves
     1. Instruction
        1. How do the types of electromagnetic waves differ?
     2. Assignment
        1. Apply the properties of electromagnetic waves to solve problems.
     3. Quiz
   1. Dual Nature of Light
      1. Instruction
         1. How does light behave as both a particle and a wave?
      2. Assignment
         1. Analyze the dual nature of light.
      3. Quiz
   2. Reflection and Refraction
      1. Instruction
         1. How is light reflected and refracted?
      2. Assignment
         1. Analyze how light is reflected and refracted.
      3. Quiz
   3. Mirrors
      1. Instruction
         1. How does light interact with mirrors to form images?
      2. Assignment
         1. Describe how light interacts with types of mirrors to form images.
      3. Quiz
   4. Lenses
      1. Instruction
         1. How does light interact with lenses to form images?
      2. Assignment
         1. Explore how lenses are used and designed.
      3. Assignment
         1. Analyze images formed by concave and convex lenses.
      4. Quiz
   5. Diffraction
      1. Instruction
         1. What happens when light is diffracted?
      2. Assignment
         1. Analyze how light is diffracted.
      3. Quiz
   6. Lab: Waves and Diffraction
      1. Instruction
         1. How does diffraction occur?
      2. Virtual Lab
         1. Explore changes in diffraction patterns using a virtual experiment.
      3. Assignment: Reflect on the Lab
         1. Answer questions based on the lab activity.
   7. **Unit Test - (Must be taken in Person)**
      1. Unit Test Review
3. Electricity
   1. Electrostatics
      1. Instruction
         1. How do electric charges behave?
      2. Assignment
         1. Describe static electric charges.
      3. Quiz
   2. Coulomb's Law
      1. Instruction
         1. What is Coulomb’s law?
      2. Assignment
         1. Practice using Coulomb’s law to solve problems.
      3. Quiz
   3. Electric Fields
      1. Instruction
         1. How does an electric field affect the movement of a charge?
      2. Assignment
         1. Practice using electric field and force formulas to solve problems.
      3. Quiz
   4. Electric Potential Difference
      1. Instruction
         1. What is the relationship between electric potential energy and electric potential difference?
      2. Assignment
         1. Practice using electric potential energy and electric potential difference to solve problems.
      3. Quiz
   5. Ohm's Law
      1. Instruction
         1. How do voltage, current, and resistance affect one another?
      2. Assignment
         1. Use Ohm’s law to calculate voltage, current, or resistance.
      3. Quiz
   6. Electric Circuits
      1. Instruction
         1. How do electric circuits vary?
      2. Assignment
         1. Describe series and parallel circuits.
      3. Quiz
   7. Transistors
      1. Instruction
         1. What is a transistor, and how is it used?
      2. Assignment
         1. Identify properties of transistors.
      3. Quiz
   8. Lab: Circuit Design
      1. Instruction
         1. How are voltage, current, and resistance related in an electric circuit?
      2. Virtual Lab
         1. Explore the relationships between voltage, current, and resistance in an electric circuit in a virtual experiment.
      3. Plan an Investigation
         1. Plan an investigation to explore circuit design.
      4. Assignment: Reflect on the Lab
         1. Answer questions based on the lab activity.
   9. Electricity Use in Homes and Businesses
      1. Instruction
         1. How do we use electrical energy in our daily lives?
      2. Assignment
         1. Determine energy usage in homes and businesses.
      3. Assignment
         1. Calculate energy usage in homes and businesses.
      4. Quiz
   10. **Unit Test - (Must be taken in Person)**
       1. Unit Test Review
4. Magnets and Electromagnetism
   * + 1. Magnets and Magnetism
     1. Instruction
        1. What are the properties of magnets?
     2. Assignment
        1. Apply the properties of magnets to solve problems.
     3. Assignment
        1. Read about Earth’s magnetic field.
     4. Quiz
   1. Magnetic Field and Force
      1. Instruction
         1. What is the relationship between magnetic field and magnetic force?
      2. Assignment
         1. Analyze magnetic fields and the forces they exert on charged particles.
      3. Quiz
   2. Electromagnetic Induction
      1. Instruction
         1. What is the relationship between electricity and magnetism?
      2. Assignment
         1. Apply what you know about the relationship between electricity and magnetism.
      3. Quiz
   3. Applications of Electromagnetic Induction
      1. Instruction
         1. What are some applications of electromagnetic induction?
      2. Assignment
         1. Analyze electromagnetic induction in real-world applications.
      3. Quiz
   4. Lab: Electromagnetic Induction
      1. Instruction
         1. How does magnetic polarity affect the current flowing in a loop of wire?
      2. Virtual Lab
         1. Experimentally observe how magnet polarity affects induced current in a wire loop using a virtual experiment.
      3. Assignment: Reflect on the Lab
         1. Answer questions based on the lab activity.
   5. **Unit Test - (Must be taken in Person)**
      1. Unit Test Review
5. Nuclear Physics
   1. The Nucleus
      1. Instruction
         1. What causes radioactivity?
      2. Assignment
         1. Practice calculations involving nuclear processes.
      3. Quiz
   2. Radioactivity
      1. Instruction
         1. What is radioactivity?
      2. Assignment
         1. Describe radioactivity.
      3. Quiz
   3. Lab: Half-Life Model
      1. Instruction
         1. How does the number of radioactive atoms change over time?
      2. Virtual Lab
         1. Explore the process of radioactive decay using a virtual experiment.
      3. Assignment: Reflect on the Lab
         1. Answer questions based on the lab activity.
   4. Fission and Fusion
      1. Instruction
         1. Why do nuclear fission and nuclear fusion release large amounts of energy?
      2. Assignment
         1. Describe nuclear reactions.
      3. Quiz
   5. The Sun's Energy
      1. Instruction
         1. How is energy emitted from the Sun?
      2. Assignment
         1. Identify the fusion process in the Sun.
      3. Quiz
   6. Special Applications of Nuclear and Wave Phenomena
      1. Instruction
         1. What types of medical applications make use of nuclear and wave phenomena?
      2. Assignment
         1. Identify properties of medical applications that use nuclear and wave phenomena.
      3. Quiz
   7. **Unit Test - (Must be taken in Person)**
      1. Unit Test Review
6. Cumulative Exam - (Must be taken in Person)
   1. Cumulative Exam Review