



**Catholic
Memorial**
HIGH SCHOOL

Year Long Course Plan

Department: Science

Course: Accelerated Foundations of Physics and Chemistry 712/713

Essential Learning Outcomes: After successfully completing this course, students will be able to:

1. Evaluate the data collected during an investigation, critique the data-collection procedures and calculate the degree of precision when possible. Suggest ways to make any needed improvements.
2. Become familiar with the language of physics and chemistry.
3. Select and use appropriate equations, and explain the physical relationship described by the equation.
4. Analyze changes in the motion of objects and the forces that act on them and represent data both algebraically and graphically.
5. Describe atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions.
6. Explain the design of the periodic table in terms of trends and relationships and its relationship to atomic structure.
7. Identify chemical and physical interactions and the flow of energy in the system.

Quarter 1	Quarter 2
<p>Unit I – Introduction to Science (ELO 1,2,3)</p> <ul style="list-style-type: none"> • Experimental Design and Scientific Method • Graphing • Safety and Lab Equipment • SI Units and Unit Conversions • Scientific Notation • Significant Figures • Accuracy and Precision • ASSESSMENT: Experimental Design, Graphing, and Safety Quiz • ASSESSMENT: Triple Beam Balance • ASSESSMENT: SI Units, Conversions, Scientific Notation, and Balance Quiz • ASSESSMENT: Graphing Quiz • ASSESSMENT: Volume Lab • ASSESSMENT: Lab Equipment Quiz • ASSESSMENT: Unit I Test 	<p>Unit II – Motion and Forces (ELO 1,2,3,4)</p> <ul style="list-style-type: none"> • Speed and Velocity Calculations • Distance vs. Time Graphing • Momentum • Acceleration • Force and Newton’s Laws • ASSESSMENT: Bubble Gum Physics Lab • ASSESSMENT: Speed Quiz • ASSESSMENT: Velocity and Momentum Quiz • ASSESSMENT: Rolling Marble Lab • ASSESSMENT: Acceleration Quiz • ASSESSMENT: Friction Lab • ASSESSMENT: Forces and Newton’s Laws Quiz • ASSESSMENT: Unit II Test <p>Unit III – Work and Energy (ELO 1,2,3,4)</p> <ul style="list-style-type: none"> • Work and Power • ASSESSMENT: Work and Power Lab • ASSESSMENT: Work and Power Quiz
Quarter 3	Quarter 4
<p>Unit IV – Matter (ELO 1,2,5,7)</p> <ul style="list-style-type: none"> • Classification of Matter • Lab Techniques • Kinetic Theory • States of Matter • Physical and Chemical Properties • Physical and Chemical Changes • ASSESSMENT: Lab Techniques Activity • ASSESSMENT: Quantitative Separation Lab • ASSESSMENT: Heating and Cooling Curves • ASSESSMENT: Classification Quiz • ASSESSMENT: Kinetic Theory/States of Matter Quiz 	<p>Unit VI – The Structure of Matter (ELO)</p> <ul style="list-style-type: none"> • Effect of structure on physical properties • Ionic and covalent bonding • Lewis dot structures • Formation of ionic compounds • Polyatomic ions • Naming ionic and molecular compounds • Writing formulas from names • ASSESSMENT: Investigating Bond Types Lab • ASSESSMENT: Lewis Dot Structure Quiz • ASSESSMENT: Unit VI Test (2 parts)

- ASSESSMENT: Density Lab
- ASSESSMENT: Copper Cycle Lab
- ASSESSMENT: Unit IV Test

Unit V – Atoms and the Periodic Table (ELO 1,2,5,6,7)

- Atomic Theory
- Bohr Model and Modern Theory
- Elements and Symbols
- Ions and Isotopes
- Periodic Table
- Atomic Mass and Isotope Abundance
- Moles to mass to particles
- Molar mass
- ASSESSMENT: Electron Density Lab
- ASSESSMENT: Unit V (Part I) Quiz
- ASSESSMENT: Periodic Table Lab
- ASSESSMENT: Relative Mass Lab with Beans
- ASSESSMENT: Element Presentation
- ASSESSMENT: Element Quiz
- ASSESSMENT: Chalk Lab
- ASSESSMENT: Mass-Moles-Particles Quiz

Unit VII – Chemical Reactions (ELO 1,2,5,7)

- *This topic has not been covered due to calendar constraints, but should be added if time permits.*