

Integrated Chemistry-Physics explores the nature of force, motion, energy, and matter. Course topics include kinematics, force, momentum, waves, atoms, the periodic table, molecular bonding, chemical reactivity, electricity, and nuclear energy.

The course provides students with opportunities to learn and practice scientific skills within the context of relevant scientific questions. Scientific inquiry skills are embedded in the direct instruction, through which students learn to ask scientific questions, deconstruct claims, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts. Lab activities reinforce skills related to writing, communication, and critical thinking, in addition to helping students develop a deeper understanding of the nature of science. Throughout this course, students are given an opportunity to understand how physics and chemistry concepts are applied in technology and engineering.

This course is built to the Indiana Academic Standards for Integrated Chemistry-Physics.

Length: Two Semesters

### **Unit 1: Introduction to Integrated Physics and Chemistry**

- Science and Society
- Scientific Investigations
- Evaluating Claims, Investigations, and Conclusions
- Introduction to Integrated Physics and Chemistry Wrap-Up

### **Unit 2: The Physics of Moving Objects**

- Characteristics of Moving Objects
- Velocity and Acceleration
- The Physics of Moving Objects Wrap-Up

### **Unit 3: Forces and Newton's Laws**

- Newton's Laws of Motion
- Gravity
- Density and Buoyancy
- Forces and Newton's Laws Wrap-Up

### **Unit 4: Momentum and Energy**

- Momentum
- Energy
- Momentum and Energy Wrap-Up

### **Unit 5: Integrated Physics and Chemistry Semester 1 Review and Exam**

### **Unit 6: Waves, Sound, and Light**

- Introduction to Waves
- Sound Waves

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- Electromagnetic Waves
  - Waves and Sound; and Light Wrap-Up

**Unit 7: Atoms and Matter**

- Atoms and Elements
- Phases of Matter
- Atoms and Matter Wrap-Up

**Unit 8: Chemical Bonds and Reactions**

- Chemical Bonds
- Chemical Reactions
- Solubility and Intermolecular Forces
- Chemical Bonds and Reactions Wrap-Up

**Unit 9: Electricity and Energy Resources**

- Electricity and Currents
- Electromagnetism
- Sources of Energy
- Electricity and Energy Resources Wrap-Up

**Unit 10: Integrated Physics and Chemistry Semester 2 Review and Exam**