

Integrated Physics and Chemistry

Integrated Physics and Chemistry is a physical science course designed for high school students needing an entry-level science course covering basic concepts found in chemistry and physics. Topics included in this study are:

- matter,
- motion and forces,
- work and energy,
- electricity and magnetism, and
- waves.

Throughout the course, students will have opportunities to observe simulations, investigate ideas, and solve problems—both on screen and away from the computer.

The course seeks to help students expand their knowledge and skills so that they may achieve the following goals:

- Gain an understanding of foundational concepts in physics and chemistry.
- Make careful observations of the surrounding environment.
- Analyze problems and solutions scientifically.
- Integrate science knowledge with real world situations at local, regional, national, and international levels.
- Appreciate the impact of science discovery on everyday life.

Unit 1: Explorations in Physical Science	
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	1. Course Overview
	2. What is Science?
	3. The Scientific Method
	4. Experiment: Making Observations
	8. Volume
	6. The Metric System
	7. Scales
	9. Experiment: Determining Volume
	10. Mass and Density
11. Experiment: Determining Density*	
12. Experiment: Density Column	
13. Quiz 2: Measuring Matter	
14. Special Project*	
15. Review	
16. Test	
17. Alternate Test*	
18. Glossary and Credits	

Unit 2: The Structure of Matter	
y an d sics ated	Assignments
	1. The History of Atomic Theory
	3. The Atomic Model
	4. Quiz 1: Atomic Structure
	5. Elements and Their Properties
	6. The Periodic Table
	7. Trends on the Periodic Table
	8. Experiment: Identifying an Unknown
	9. Compounds
	10. Quiz 2: Pure Substances
11. Mixtures	
12. Separating Mixtures	
13. Experiment: Separating a Mixture	
14. Quiz 3: Mixtures	
15. Special Project*	
16. Review	
17. Test	
18. Alternate Test*	
19. Glossary and Credits	

Unit 3: The Structure of Matter	
Assignments	
Integrated Physics and Chemistry	1. States of Matter
	2. Changes of State
	3. Experiment: Graphing Changes of State
	4. Solutions - The Dissolving Process
	5. Acids and Bases
	6. Experiment: The Cabbage Indicator
	7. Quiz 1: Physical Changes
	8. Chemical Bonding
	9. Atomic Structure and Bonding
	10. Experiment: Chemical Changes
	11. Chemical Reactions and Conservation of Mass
	12. Types of Chemical Reactions
	13. Quiz 2: Chemical Changes
	14. Radioactivity
	15. Nuclear Reactions
	16. Experiment: Half-Life
	17. Nuclear Energy
	18. Quiz 3: Nuclear Changes
	19. Special Project*
	20. Review
	21. Test
	22. Alternate Test*
	23. Glossary and Credits

Unit 4: States of Matter	
Assignments	
Integrated Physics and Chemistry	1. Properties of Solids
	2. Experiment: Comparing Hardness and Density of Solids
	3. Elasticity and Strength in Solids
	4. Electrical Conductivity in Solids
	5. Quiz 1: Solids
	6. Characteristics of Liquids
	7. Experiment: Viscosity
	8. Pressure in Liquids
	9. Archimedes' Principle and Flotation
	10. Liquids and Capillary Action
	11. Quiz 2: Liquids
	12. General Characteristics of Gases
	13. Pressure and Volume in Gases
	14. Experiment: Pressure in Gases
	15. Temperature and Volume Changes in Gases
	16. Quiz 3: Gases
	17. Special Project
	18. Review
	19. Test
	20. Alternate Test*
	21. Glossary and Credits

Unit 5: Motion and Forces	
Assignments	
Integrated Physics and Chemistry	1. Distance and Displacement
	2. Speed and Velocity Acceleration
	3. Motion Graphs
	4. Experiment: Motion Graphs
	5. Momentum
	6. Project: Virtual lab - Conservation of Momentum
	7. Quiz 1: Motion
	8. Forces
	9. Friction
	10. Distance and Displacement
	11. Newton's Laws
	12. Project: Virtual Lab - Newton's Laws
	13. Experiment: Propulsion
	14. Centripetal Force
	15. Quiz 2: Forces
	16. Project: Virtual Lab - Circular Motion
	17. Special Project*
	18. Review
	19. Test
	20. Alternate Test*
	21. Glossary and Credits

Unit 6: Semester Review and Exam	
Assignments	
IPC	1. Review
	2. Exam
	3. Alternate Exam - Form A*
	4. Alternate Exam - Form B*

Chemistry and Integrated Physics	Unit 7: Work and Energy																				
	Assignments																				
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Integrated Physics and Chemistry	Unit 11: Chemistry and Physics in Our World	
	Assignments	
	<ol style="list-style-type: none"> 1. Carbon Dioxide and Global Warming 2. Experiment: Carbon Dioxide and Water Acidity 3. Fossil Fuels' Effect on the Environment 4. Media and Science 5. Experiment: Water Acidity and the Environment 6. Quiz 1: Environmental Chemistry 7. Atomic Spectra and Moving Stars 8. The Temperature of Stars 	<ol style="list-style-type: none"> 9. Kepler and the Motion of the Spheres 10. Experiment: Kepler's Second Law 11. Quiz 2: Space Physics 12. Special Project* 13. Review 14. Test 15. Alternate Test* 16. Glossary and Credits

IPC	Unit 12: Semester Review and Exam	
	Assignments	
	<ol style="list-style-type: none"> 1. Review 2. Exam 	<ol style="list-style-type: none"> 3. Alternate Exam - Form A* 4. Alternate Exam - Form B*

IPC	Unit 6: Final Exam	
	Assignments	
	<ol style="list-style-type: none"> 1. Final Exam 2. Alternate Exam - Form A* 	<ol style="list-style-type: none"> 3. Alternate Exam - Form B*