



Science/Chemistry

GRADE LEVEL:

Jr. High and High School

Scope and Sequence

COURSE OVERVIEW:

Chemistry is an amazing branch of science that affects us every day, yet few people realize it, or even give it much thought. Without chemistry, there would be nothing made of plastic, there would be no rubber tires, no tin cans, no television, no microwave ovens, or something as simple as wax paper. This book presents an exciting and intriguing tour through the realm of chemistry as each chapter unfolds with facts and stories about the discoveries and discoverers. Find out why pure gold is not used for jewelry or coins. *Exploring the World of Chemistry* brings science and scientific discovery to life.

FEATURES:

Filled with photos and illustrations to enhance the learning perspectives, this text contains concepts for discussion and review, detailed content explanations, chapter exams, and a thorough glossary of terms that can be utilized for reviewing vocabulary or spelling ability. Answers to the chapter tests are available in the back of the book. This title is available as a stand-alone text or in a special "*Exploring Series*" package that includes: biology, chemistry, Earth science, ecology, mathematics, history of medicine, and physics.

CONTENT FOCUS:

Chapter 1: Ancient Metals

Concepts for discussion:

- Ancient people had iron tools.
- Iron resisted efforts to remove it from its ore.
- The Scott expedition to the South Pole perished in a blizzard when their fuel cans were found empty.

Chapter 2: The Money Metals

Concepts for discussion:

- Gold was the most prized of ancient metals.
- Gold was too soft for many purposes.
- People who breathed mercury fumes became confused.

Chapter 3: The Search for Gold

Concepts for discussion:

- Natural rubber became brittle in cold weather and sticky in hot weather.
- Although made of pure carbon, graphite and diamond differ in properties.
- Chemists secretly tried to make gold and changed chemistry into alchemy, a false science.

Chapter 4: Gases in the Air

Concepts for discussion:

- The reaction of the acid with metals gave off a gas that chemists had never seen before.
- Carbon dioxide that was dissolved in water caused it to fizz.
- A brief way of showing chemical elements was needed.

Chapter 5: Electricity to the Rescue

Concepts for discussion:

- A blast furnace could not set some elements free from their ores.
- Chemists needed a dependable supply of electricity.
- Potash and soda ash were thought to contain metallic elements.

Chapter 6: Search for Order

Concepts for discussion:

- The large number of elements and their properties became confusing.
- Chemists were baffled by a number of annoying problems such as atomic weight.
- The periodic table of the elements had gaps.

Chapter 7: Sunlight Shows the Way

Concepts for discussion:

- A prism separated clear, white light into a rainbow of colors.
- The spectrum of the sun was crossed by a series of lines.
- Lines in the sun's spectrum could not be matched with any known element.



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Chapter 8: The Electron Shows the Way

Concepts for discussion:

- Elements differed in the way they combined with other elements.
- A simple battery of copper, zinc, and sulfuric acid generated electricity.
- Chemists needed to probe inside an atom to learn its structure and composition.

Chapter 9: Compounds by Electric Attraction

Concepts for discussion:

- Highly active elements have especially stable compounds.
- Cities thrive in harsh, desert climates but cities in good climates failed.
- Because it was so chemically active, fluorine resisted being freed from other elements.

Chapter 10: Water

Concepts for discussion:

- Many substances dissolved in water.
- Water expanded as it froze, and ice floated on water.
- Water resisted changes in temperature.

Chapter 11: Carbon and Its Compounds

Concepts for discussion:

- Carbon formed more compounds than all the other elements combined.
- A tank that should have contained fluorine was empty.
- Crude oil that seeped to the surface was a nuisance.

Chapter 12: Organic Chemistry

Concepts for discussion:

- Organic compounds were difficult to make in a laboratory.
- Chemists could not describe the structure of benzene, a simple carbon compound.
- Carboic acid reacted with formaldehyde to make a solid that resisted the action of water and alcohol.

Chapter 13: Nitrogen and Its Compounds

Concepts for discussion:

- Nitrogen compounds were unstable and broke apart easily.
- Liquid nitroglycerine was very dangerous to use.
- Alfred Nobel was called a merchant of death because his explosive was used in military weapons.

Chapter 14: Silicon and Its Compounds

Concepts for discussion:

- Quartz withstood rapid changes in temperatures.
- Colored glass was easier to make than perfectly clear glass.
- Temperature changes severely affected motor oils.

Chapter 15: Modern Metals

Concepts for discussion:

- Although common, aluminum was difficult to separate from bauxite ore.
- Photographic film left in a desk became fogged as if exposed to light.
- Pitchblende was radioactive even after the uranium was removed.

Chapter 16: Chemistry in Today's World

Concepts for discussion:

- People working alone made chemical discoveries.
- People working as teams made chemical discoveries.
- People working in other fields made chemical discoveries.