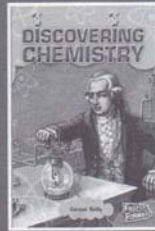


Discovering Chemistry



Before Reading

Motivation / Purpose

The purpose of this text is to report on the history of chemistry from ancient times through to today. The text links with the Science theme *Natural and Processed Materials*.

Text Type

Draw students' attention to the:

- chapter headings
- subheadings and fact boxes
- photographs and illustrations
- charts and timelines
- glossary and index.

Ask, "What type of book is this?" (Report)

Visual Literacy

Look at the front and back cover. What are the people in the illustration and photographs doing? Look at the first few pages of the book, and analyse the design. How does the design link to the subject matter?

Background Knowledge

Ask students to share their ideas about the meaning of H₂O. What do you think the letters represent? What other symbols do you know? (e.g. CO₂) In what branch of science do you think scientists discovered H₂O and CO₂? What is the name given to substances like hydrogen, carbon and oxygen? (elements) What other elements do you know of?

Phonological Awareness

Ensure students know these phonological patterns:

- /ch/: ancient (p.7), mixture (p.15), centuries (p.18)
- /sh/: conditions (p.5), reactions (p.8), connections (p.16)
- /k/: chemistry (p.4), alchemy (p.8), cosmetics (p.23)
- /x/: oxygen (p.13), example (p.15), dioxide (p.15)

Revise these sounds: /j/: managed (p.8), nitrogen (p.13); /s/: science (p.4), Greece (p.6); /er/: earth (p.6); long e: studies (p.4), materials (p.5)

Write the above phonological patterns on separate charts. Have students scan the text to locate three words containing each phonological sound. Ask students to write the words onto the charts and underline letters that represent each phonological sound.

Vocabulary

alchemists, atomic, calcium, chemically, chemistry, clay, compound, connections, current, element, experimenting, fabrics, funnels, hydrogen, investigate, material, medicines, mixture, nitrogen, observations, oxygen, periodic, predicted, reactions, scales, sodium, strainers, substance, system

Write words containing the above phonological patterns onto cards. Ask students to pick up word cards with a particular phonological pattern, e.g. Pick up word cards with a long e sound.

High Frequency Words

actually, advances, beginnings, branch, combine, contains, continued, developed, discovered, everything, everyday, managed, naming

Before showing the words, dictate each word to the students. Check their spelling. Show students the words and have them memorise the words. Dictate the words again. How did your spelling improve?

During Reading

Vocabulary in Context

Discuss the meaning of each vocabulary word.

Write words on cards. Have the students group the words according to their own criteria. Have them justify their choice e.g. things scientists do – *observations, experimenting, investigate*; words containing -gen – *hydrogen, oxygen, nitrogen*.

Write word families for the high frequency and vocabulary words. How do the base words change? Have students identify the function of each word, e.g. *observe* (verb), *observation* (noun), *observing* (verb), *observer* (noun)

Checking for Meaning

Literal:

What is chemistry? (Chemistry is the branch of science that studies the elements.)

Explain the meaning of *elements* and *atoms*. (Elements are substances made of only one type of atom. Atoms are substances in their purest form.)

What did people in ancient times believe were the five elements? (They believed the elements were air, fire, earth, water, metal.)

What information does the Periodic table list? (It lists all of the known elements, and their atomic numbers.)

Inferential:

How would our lives be different if these elements had not been discovered?

How many elements have been discovered?

Response:

Which elements were familiar to you? What other elements do you know of? Do you think new elements could still be discovered?

Which inventions do you think have helped chemists to do their work in more recent times?

Grammatical Patterns

Ensure students understand these components of a report:

- Introductory paragraph defining the topic. *Everyday things ... are made up of ... substances. Chemistry is the branch of science that studies the elements – what things are made of and how they change.* (p.4)
- Passages describing various aspects of the topic: *Chemistry in ancient times* (pp.6–9), *periodic table* (pp.16–17)
- Paragraphs with topic sentences: *Throughout the 1700s and 1800s, scientists made more advances in chemistry.* (p.13), *Humphrey Davy (1778–1829) found a way to split compounds using an electric current.* (p.15)
- Use of timeless present tense: *Scientists who study chemistry are called chemists.* (p.5)
- Use of past tense action and relating verbs: *They also invented tools such as funnels, strainers and scales, which were later used in chemistry.* (p.8)
- Use of general nouns: *years* (p.9), *book* (p.14), *world* (p.22)
- Use of technical language: *chemistry* (p.4), *elements* (p.4), *experiment* (p.13)
- Use of noun groups as the focus of a clause: *The periodic table lists all the known elements.* (p.18)
- Use of connectives as sentence beginnings: *For many centuries,* (p.8), *During the 1600s* (p.10), *A little later,* (p.14), *In addition,* (p.17)

Fluency / Punctuation Patterns

These punctuation patterns occur in the text:

- Use of capital letters to begin proper nouns: *Middle Ages* (p.8), *Lavoisier* (p.14), *Russian* (p.16)
- Use of capital letters in acronyms: *AD* (p.8), *LCD* (p.23), *TV* (p.23)
- Use of brackets to surround spans of years: *(500 AD to 1500 AD)* (p.8)
- Use of commas to separate nouns in a list. *Scientists began to see that air, earth, fire and water were not elements themselves ...* (p.10)

In this text, dashes indicate that related information is to follow. *Everyday things – all kinds of materials, as*

well as plant, animal and human life – are made up of a number of substances. (p.4) Demonstrate reading these sentences, pausing at the dashes and commas. Have students echo your reading.

Write 1843–1907. What do these dates mean? What does the dash indicate? Demonstrate how to read dates and have students read other year spans recorded in the text.

Critical Literacy

Write *Scientists who study chemistry are called chemists.* (p.5) *Other people experimented with turning ordinary metals into gold. This practice became known as alchemy.* (p.8) How do these types of sentences help you to understand word meanings as you are reading? What difference would it make if these definitions were left out? Locate further examples where words and ideas are defined in the text.

Linking Visual and Written

Talk about why this book has a combination of illustrations, black and white photographs and colour photographs. What discoveries in chemistry have contributed to the development of these different visual representations?

Look at the table on pages 20–21. How does the presentation of information in a table help you understand the information more easily?

After Reading

Have students search the internet to locate an interactive periodic table to help them become more familiar with the elements and their properties. Look back at the text and identify the letter and atomic number of elements using the periodic table.

Activities

Students will:

- recall and write facts to demonstrate their comprehension of the text
- write words from the text containing specified phonological letter patterns
- change base words to fill gaps in sentences
- punctuate sentences using commas.

Comprehension (meaning) Vocabulary (structure) Phonics (visual) Writing (structure)

