

Introduction

Reading to learn can be used to promote independent learning capabilities and achieve the learning targets of the Chemistry curriculum. Reading is not just for the improvement of language proficiency, but can serve many other important purposes, which adds value to the quality of our life. These include reading for interest, appreciation, enrichment of knowledge and experience.

As science and technology are advancing rapidly, reading is an important means to keep in touch with the frontier developments. Having the chance to get access to a wide range of books, newspapers, magazines, encyclopedias, websites, *etc.* students will appreciate the achievement of scientists and thus develop curiosity, healthy skepticism and perseverance. Hence, it is essential for chemistry teachers to provide opportunities and guidance for students to read actively, critically and efficiently for the betterment and advancement of their scientific literacy.

Active Reading

Science texts are generally expository and more information-oriented than other narrative type reading materials. For effective comprehension, students need to be actively involved in reading. Teachers can use a number of strategies to promote active reading for understanding. Directed reading activities make students focus on important parts of the text and involve them in reflecting on its content.

Before students start reading, teachers may introduce briefly the theme of the text, or alternatively challenge students to agree or disagree to a few statements and ask them to justify their opinions. While students start reading, they may take notes to clarify ideas, and to challenge or question the text. They may stop occasionally in order to evaluate whether the text is understood. Sometimes the students should reread the text to revise understanding. They may also predict what will come next. Students may use concept maps and flow diagrams to connect the ideas and details.

Reading Materials

Quality reading materials embracing different text-types can be chosen from a wide variety of sources (printed and non-printed) to widen students' exposure and knowledge. Relevant materials extracted from books, science magazines and newspapers can stimulate students' interest in the topic and enable them to relate science to daily life. The science magazines listed below are written for secondary school students or the general public. The texts are fairly concise and readable. However, it is important for teachers to provide adequate guidance to ensure their students engage in systematic analysis and careful criticism.

Some reference books

- ◆ Ball, P. (1994). *Designing the molecular world: chemistry at the frontier*. Princeton, N.J.: Princeton University Press.
- ◆ Schwarcz, J. (2001). *Radar, Hula Hoops, and Playful Pigs: 62 Digestible Commentaries on the Fascinating Chemistry of Everyday Life*. New York: Henry Holt and Company, LLC.
- ◆ Schwarcz, J. and Schwarz J. (2001). *The Genie in the Bottle: 64 All New*

Commentaries On the Fascinating Chemistry of Everyday Life. New York: Henry Holt and Company, LLC.

- ◆ 師明睿(2004)《蘇老師辦化學》天下文化。
- ◆ 蔡信(2003)《現代化學 I—改變中的傳統概念》天下文化。

Some magazines

- ◆ Catalysts (<http://www.philipallan.co.uk>)
- ◆ ChemMatters (<http://www.acs.org/education/curriculum/chemmatt.html>)
- ◆ Chemistry Review
- ◆ Chem 13 News (<http://sciborg.uwaterloo.ca/chem13news/index.html>)
- ◆ New Scientist (<http://www.newscientist.com>)
- ◆ 科學人(<http://www.sciam.com.tw>)
- ◆ Scientific American
- ◆ Journal of Chemical Education
- ◆ Education in Chemistry

After Reading

Questions can be provided at the end of the text as directed reading activities to promote reading for meaning. The questions promote learning by helping students to link what they have read with their chemical knowledge and with their everyday life experiences. They also help teachers know about what the students have learnt. The first few questions can be simple. Open-ended questions that ask for interpretation, discussion and evaluation can be put later. The open-ended questions can be used as a basis for discussion of a wider issue raised by the text, or for some library research. Students may be asked to write a summary or a report about the article, to prepare a poster related to the theme of feature, to write a story to stimulate imaginative thinking, or to give an oral presentation of their ideas. Certainly, teachers should exercise their professional judgement to include appropriate questions to accompany the text.

To facilitate chemistry teachers to make use of reading to learn in the learning and teaching of the revised Sixth Form Chemistry Curriculum, a number of articles are prepared. Some of the reference books listed below contain chemistry comprehension exercises which may serve as a good start for teachers to prepare reading tasks for students.

- ◆ Karukstis, K. K. & Van Hecke, G. R. (2003). *Chemistry Connections: The Chemical Basis of Everyday Phenomena (2nd Edition)*. San Diego: Academic Press.
- ◆ Lewis, D. R. and McMonagle, D. (1993). *Comprehension questions in advanced chemistry*. Walton-on-Thames, Surrey: Thomas Nelson.
- ◆ Scott, P.R. (1990). *Using your chemistry: comprehension questions for advanced level*. Cheltenham, England: Stanley Thornes Publishers.
- ◆ Taylor, J.R. (1992). *Chemistry at work: comprehension exercises for advanced level*. London: John Murray.
- ◆ Hill, G. & Holman, J. (2000). *Chemistry in Context: Laboratory Manual and Study Guide (5th Edition)*. Gloucestershire: Nelson Thornes Ltd.

References

Curriculum Development Council. (2001). *Learning to Learn - The Way Forward in Curriculum*. Hong Kong: Printing Department.

George T. Martin. (2002). Reading, Writing and Comprehending. *The Science Teacher*, Oct. pp.56-59.

<http://www.teachingenglish.org.uk/think/read/darts.shtml>

http://www.readingonline.org/articles/art_index.asp?HREF=teclehaimanot/index.html