SCIENCE IN A TECHNICAL WORLD

***Science in a Technical World* is an interdisciplinary course with a focus on science applications in a variety of industries. The publishers recommend that the program be used as either a Tech Prep course or as a supplement to core high school science courses. The program is organized into 12 thematic modules, each with a student book, video, and CD-ROM.**

Publisher:	W. H. Freeman and Company	Grade Level:	11–12
Year Published:	2000	Scientific Domain:	Integrated
Developer:	American Chemical Society	Web Sites:	http://www.whfreeman.com; http://www.acs.org/education

CONTENTS *Science in a Technical World* modules focus on the issues relevant to science-related industries. The industries serve as central themes for the development of science concepts. The 12 modules in the program are listed below.

UNIT TITLE	SCIENCE CONCEPTS
Carbonated Beverages	Properties of matter, water chemistry, solutions, pH, acids and bases.
Polymer Research and Development	Natural and synthetic polymers, polymer synthesis and molecular structure, polymer properties, force.
Plant Tissue Culture	Sexual and asexual reproduction in plants, Mendelian genetics, mitosis, cell differentiation, microbiology.
Paint Research and Development	Mixtures, solvents, viscosity, adhesion.
Wastewater Treatment Plant	Physical and chemical changes, water chemistry, solutions (concentration, dilution, and gas solubility), suspensions, pH, microorganisms, velocity.
Pulp and Paper	Properties of matter.
The Drug Discovery Process	Available
Food Safety	Available
Petroleum Refining	Available
The Semiconductor Industry	Available
Medical Technology	Available
Criminal Forensics	Available

FORMAT The four components of the *Science in a Technical World* curriculum are:

- a softcover student book for each unit,
- a video tour of the industry for each unit,
- a CD-ROM for each unit, and
- a softcover Teacher's Edition for the entire program.

Student Book: Each student book contains a challenge or problem associated with the unit's industrial theme. Units have the following sections:

- *Introduction*: presents the problem and identifies the students' role in solving the problem, and an "industry overview."

- *Technician Orientation*: identifies the concepts, information, processes, and skills students need to solve the unit's problem, then provides information and a sequence of laboratory experiences designed to promote understanding of the issues related to the problem.
- *The Work*: sets an industry-related context for students to apply knowledge and skills gained in previous experiences through laboratory exercises and background information.
- *Data and Results*: specifies a format for students to present their findings and offer solutions to the unit problem.

Teacher's Guide: The Teacher's Guide (available August 2000) includes the student book with wraparound notes for teachers.

Video Tours: Each 15–20 minute video shows the processes and perspectives of the workers in the industry featured in the unit as well as applications of the science content.

CD-ROM: This technology piece has five sections, which students can navigate in any order. (1) The Introduction shows still photographs, informational text, and accompanying audio. (2) The Question section includes factual and application questions about the industry and related materials. Students navigate through each question to find answers. (3) Technician Tasks gives an overview of occupations in the industry. (4) Practice Exercises provide self-assessment of science content knowledge and identification of occupational skills and processes. (5) The Assessment section contains two parts. The Lab section asks students to identify techniques and/or information about the industry-related processes. The second section tests students' knowledge related to the industry and/or the products of that industry.

INSTRUCTIONAL DESIGN

Science in a Technical World is designed to provide realistic problems that might be faced by technicians or other employees in science-related industries. Using this program, the classroom environment simulates the workplace. Students learn science content and process skills in the context of solving problems that might arise in industrial settings. Laboratory investigations, teamwork, and opportunities for oral and written communication are important features of the program. Students maintain a notebook record of all their work.

ASSESSMENT

Science in a Technical World includes both formative and summative assessments. "Thinking About" questions in the student books prompt students to reflect on their laboratory experiences and make connections to science content and occupational skills. Other questions ask students to reflect on how they would explain information or describe techniques when training another person. For summative assessments, students present their solutions to the unit problems. After receiving feedback from the teacher and their peers, students are asked to reflect on their work. The CD-ROM also includes questions that assess students' knowledge.

RESOURCES AND SUPPORT

Student books contain safety guidelines, lists of resources including web sites and industry-related organizations, and industry standards for operating procedures and laboratory analysis.