

The Library is a CD-ROM of printable materials for the teacher, including worksheets, handouts, lab materials, and teacher notes. Adobe Acrobat Reader is required to print the materials and is included on the CD. A schedule of topics and the number of class periods suggested to cover the material and teacher bullet notes make preparation for the teacher very easy. The student handouts include notes and example problems, which are invaluable to the student. The worksheets have many types of questions with answers that will help students prepare for exams. The lab materials give an abstract, objectives, references, and materials needed. The procedures were not included.

The Student Tutorial is one CD-ROM that covers all topics included on the Advanced Placement Chemistry exam. The material is presented in a six-step interactive learning sequence. Step 1 is Assess Me, which is a pretest. Step 2, Teach Me, uses audio and visual presentations of the material. Step 3 is Show Me, which gives step-by-step explanations of problems. Peer tutors model the thought processes involved in solving the problems. Step 4 is Let Me Try, where the student tries interactive problems. Helps, hints, and feedback are presented as the student proceeds through the problem, allowing the student to make corrections as needed. Step 5 is Test Me, where the student works through sample test questions. The peer tutor will then give the correct solution with feedback to the student. Step 6 is Finish Me, where students are given a histogram of their progress through the five previous steps so that they know whether they have learned the material or need to review more. The teacher is able to access the students' performance through the Student Monitor portion of the package.

The topics in the Student Tutorial are presented using a floor plan as the menu. Each topic is a different floor: (1) Atoms and Electrons, (2) Molecules, (3) Gases, Stoichiometry, and Colligative Properties, (4) Kinetics, (5) Equilibrium, (6) Acids and Bases, (7) Thermochemistry and Thermodynamics, (8) Electrochemistry, (9) Chemical Reactions, and (10) Nuclear and Organic Chemistry. Each floor has three to seven stations dealing with subtopics. For example, on the first floor, there are six stations: light energy, the Bohr model, electronic structure, quantum numbers, periodic trends, and the periodic table. This allows students to quickly choose the area they want to work on. Each station takes 30 to 40 minutes to complete. Since there is usually so little class time to adequately practice problems, the Student Tutorial will allow students to have guided practice and instruction any time they are available to go to the computer.

The third component of the package is the Student Monitor. This program allows the teacher to follow the progress of each student through the student modules. This permits the teacher to see the areas that students have mastered and the areas where they are having difficulty. So many times, students cannot articulate where they may be having specific problems or they will not ask the teacher for help. The Student Monitor lets the teacher know where and what problem areas are and then can address them.

The complete Teacher's Edition includes 3 CD-ROMs—Teacher's Tools Library, Student Tutorials, and Student Moni-

tor, plus 5 additional Student Tutorials. The cost is \$599 and the software comes as either an NT network version or a stand-alone version. Individual components and extra CD-ROMs may also be purchased. You may visit the Web site at <http://www.films.com> or call toll-free 1-800/257-5126 for further information.

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### **ChemSkill Builder 2000, Version 6.1 [CD-ROM]**

by James D. Spain and Harold J. Peters

Electronic Homework Systems: Creston, IA, 1999. ISBN 1-890803-30-8. \$20.00.

reviewed by Wendy L. Keeney-Kennicutt

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One of the major challenges for faculty teaching general chemistry is how to encourage students to practice solving problems. We know that for students to develop chemical intuition and problem-solving skills, they must "get their hands dirty" as they decipher and unravel problems inherent to our discipline. One tool that I've used since its release in 1996 is the *ChemSkill Builder*, an electronic homework package. The latest version, *ChemSkill Builder (CSB) 2000*, version 6.1, is an excellent, effective integration of teaching and testing most quantitative and conceptual learning objectives in an interactive way. It is inexpensive and easy to use for both students and faculty.

The *CSB 2000* package of personalized problem sets, specifically designed to complement most general chemistry courses, is a program on CD-ROM for PC Windows users (3.1, 95, or 98), with more than 1500 questions and a 3½-in. record-management disk. There is a separate grade-management disk for the instructor. It has 24 gradable chapters, each with 5 or 6 sections, plus two new chapters that are not graded: Polymer Chemistry and an Appendix of Chemical Skills. Each section begins with a short review of the topic and many have interactive explanations. If students miss an answer, they are given a second chance for 70% credit. If they still miss, the worked-out solution is presented in detail. Students can work each section as many times as they wish to improve their scores. Periodically, the students download their data directly into a PC set up by the instructor. The data can be easily converted into an ASCII file and merged with a spreadsheet. The use of CD-ROM solves the sporadic problems associated with previous versions on 3½-in. disks: software glitches, failed disks, and system incompatibilities. The quality and number of graphics and interactive exercises are much improved in this latest version. I particularly enjoyed the interactive explanations of significant figures and dimensional analysis in Sections 2.3 and 2.5, the pH meter simulation in Section 18.3, the Geiger counter simulation in Section 23.5, and the new periodic table game in Appendix A.

## Book &amp; Media Reviews

I informally polled my Fall 1999 students on their midsemester impressions of the *ChemSkill Builder*, version 5.1—the previous version. The preliminary results in Table 1 show an overall acceptable rating of 3.45. Note that 51% of the students thought that incorporating the *CSB* into the syllabus was good to very good, compared to only 16% who gave negative responses. Positive comments included “a great tool to study for the test” and “it shows how to work out the problems”. The major negative comment was that the *CSB* was too time-consuming because the acceptable answer had to include the right number of significant figures and the correct units—exactly what an instructor wants the student to learn.

Table 1. Students' Ratings of *ChemSkill Builder*

| Mid-term Grade | Av. Rating | No. of Students | No. (%) of Students Who Gave Rating |         |         |             |         |
|----------------|------------|-----------------|-------------------------------------|---------|---------|-------------|---------|
|                |            |                 | 5 Very Good                         | 4 Good  | 3 OK    | 2 Not Great | 1 Awful |
| A              | 3.36       | 36              | 3 (8)                               | 15 (42) | 11 (31) | 6 (17)      | 1 (3)   |
| B              | 3.48       | 59              | 7 (12)                              | 24 (41) | 19 (32) | 8 (14)      | 1 (2)   |
| C              | 3.41       | 43              | 5 (12)                              | 13 (30) | 18 (42) | 7 (16)      | 0 (0)   |
| D              | 3.55       | 29              | 3 (10)                              | 14 (48) | 8 (28)  | 4 (14)      | 0 (0)   |
| F              | 4.00       | 4               | 1 (25)                              | 2 (50)  | 1 (25)  | 0 (0)       | 0 (0)   |
| Total          | 3.45       | 171             | 19 (11)                             | 68 (40) | 57 (33) | 25 (15)     | 2 (1)   |

Interestingly, the scores given appeared to be independent of the students' midterm grades, suggesting that acceptance of this product might be linked to a specific learning style. When I compared my students' responses to their Keirseley temperaments (refer to <http://keirseley.com/>) in Table 2, the *ChemSkill*

*Builder* appealed somewhat more to the students who like activity, entertainment and immediate feedback (SP) or who enjoy technology and constant success experiences (NT) than to the students who prefer more group interactions (NF) or who need more structure (SJ).

Table 2. Relationship of Students' Ratings of *ChemSkill Builder* to Keirseley Temperament

| Keirseley Temperament | Av. Rating | No. of Students | No. (%) of Students Who Gave Rating |           |           |             |         |
|-----------------------|------------|-----------------|-------------------------------------|-----------|-----------|-------------|---------|
|                       |            |                 | 5 Very Good                         | 4 Good    | 3 OK      | 2 Not Great | 1 Awful |
| SP                    | 3.89       | 14              | 3 (21)                              | 6.5 (46)  | 4.5 (32)  | 0 (0)       | 0 (0)   |
| NT                    | 3.76       | 21              | 3.5 (17)                            | 12 (57)   | 3 (14)    | 2 (10)      | 0.5 (2) |
| NF                    | 3.43       | 29              | 4 (14)                              | 11.5 (40) | 7 (24)    | 6 (21)      | 0.5 (2) |
| SJ                    | 3.34       | 98              | 8.5 (9)                             | 34 (35)   | 38.5 (39) | 16 (16)     | 1 (1)   |
| Total                 | 3.46       | 162             | 19 (12)                             | 64 (40)   | 53 (33)   | 24 (15)     | 2 (1)   |

At the semester's end, the students were asked again to rate the *ChemSkill Builder*, and 97% of 155 responses either agreed (28%) or strongly agreed (69%) that it proved helpful in learning course material. Moreover, 99% thought that I should continue to incorporate the *ChemSkill Builder* in future courses.

To summarize, the *ChemSkill Builder 2000*, version 6.1, will be an excellent tool for augmenting the learning process in the general chemistry classroom.

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