

Commencement-Level:

**PHYSICAL SETTINGS
CHEMISTRY**



CHEMISTRY

STARREVIEW



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TO THE STUDENT & TEACHER

PHYSICAL SETTING: CHEMISTRY STARVIEW is written based on the new standards and assessments for chemistry. It is a comprehensive review of the Key Ideas, Major Understandings, Performance Indicators, Process Skills, and Real World Connections as set forth in the University of the State of New York Education Department: *Physical Setting: Chemistry Core Curriculum*.

“OPEN FIRST”

The student should upon receiving this *STARview* begin by reading this section: “To the Student.”

- Start by reviewing the Table of Contents (previous 4 pages). This will give an overview of the major topics reviewed in this book.
- Now, become familiar with Unit 13 (page 335) Index & Glossary. This section is an extensive listing of the key chemical terms that one needs to know in order to understand the material. A brief definition or explanation of the term is given together with cross-referenced pages to direct the student to additional material directly related to the term.

ORGANIZATION

The book is organized “conceptually,” but the review is linked through the following organizational parts.


- **Standards** are the overall, general goals that apply to all scientific and indeed most general learning. For example, each Standard contains several goals, such as “Analysis, Scientific Inquiry, and Engineering Design in order to pose questions, seek answers, and develop solutions.”
- Within each Standard, **Key Ideas** are used to further define the generalized objectives to be reached. For example, Standard 1 has several Key Ideas such as Key Idea 1 within the Scientific Inquiry part of Standard 1, that is, “to develop explanations of natural phenomena in a continuing, creative process.”
- For each Key Idea there are several **Process Skills** which specifically identify what processes the student must learn in order to demonstrate the particular Key Ideas of a general Standard. These Skills are identified and found in all Units followed by explanations of the Skill and questions to test the student’s abilities in preparation for the final, year-end test.

- Associated with both Standards and their Key Ideas are the **Performance Indicators**. These tell the student specifically what he/she is expected to know in order to answer correctly the questions on the final, year-end test. In other words, the specific objectives of the testing. These are identified at the beginning of each Unit and again at the end of each unit with the Part A, B, and C questions.
- Finally, there are the **Major Understandings**. Each Performance Indicator has specific concepts and chemical understandings to learn. This is the “meat and potatoes” of *Physical Setting: Chemistry STARreview*. These Major Understandings are first listed at the beginning of each Unit, are further developed in the text, examples, sample problems, and illustrations that follow, and are tested through out the Unit in the Skills and at the end of each Unit in Parts A, B, and C.

MEANING OF SYMBOLS

Symbols are critical in chemistry. So, the authors have developed a mini-help system. Stars are used to help navigate the student through the more complex Major Understandings in chemistry.

Stars indicate two important things: Some stated material may not be *specifically* referred to in the *Core Curriculum*, but this text is needed for better understanding of major chemical concepts. Also, stars may note special material that further explains Major Understandings, Skills, and Real World Connections.

In addition, the  followed by a page number, directs the student to related material. These stars can help either by (1) providing a page reference to where that concept is further explained, or (2) give the student additional information making total understanding better.

FINALLY, STUDY

Success comes through study. The authors and editors of *Physical Setting: Chemistry STARreview* are teachers. This book has been written to provide the student with the best “outside help” possible. But, it can only help the student, if the student uses it consistently, with purpose, and focused study.

We wish you good studying and success on your final, year-end test.



UNIT 11

MATH & LAB SKILLS

STANDARD 1: MATHEMATICAL ANALYSIS: KEY IDEA 1: ABSTRACTION AND SYMBOLIC REPRESENTATION ARE USED TO COMMUNICATE MATHEMATICALLY.

STANDARD 1: MATHEMATICAL ANALYSIS: KEY IDEA 2: DEDUCTIVE AND INDUCTIVE REASONING ARE USED TO REACH MATHEMATICAL CONCLUSIONS.

STANDARD 1: SCIENTIFIC INQUIRY: KEY IDEA 1: THE CENTRAL PURPOSE OF SCIENTIFIC INQUIRY IS TO DEVELOP EXPLANATIONS OF NATURAL PHENOMENA IN A CONTINUING, CREATIVE PROCESS.

STANDARD 1: ENGINEERING DESIGN: KEY IDEA 1: ENGINEERING DESIGN IS AN ITERATIVE PROCESS INVOLVING MODELING AND OPTIMIZATION (FINDING THE BEST SOLUTION WITHIN GIVEN CONSTRAINTS); THIS PROCESS IS USED TO DEVELOP TECHNOLOGICAL SOLUTIONS TO PROBLEMS WITHIN GIVEN CONSTRAINTS.

STANDARD 2: INFORMATION SYSTEMS: KEY IDEA 1: INFORMATION TECHNOLOGY IS USED TO RETRIEVE, PROCESS, AND COMMUNICATE INFORMATION AS A TOOL TO ENHANCE LEARNING.

STANDARD 2: INFORMATION SYSTEMS: KEY IDEA 2: KNOWLEDGE OF THE IMPACTS AND LIMITATIONS OF INFORMATION SYSTEMS IS ESSENTIAL TO ITS EFFECTIVENESS AND ETHICAL USE.

STANDARD 6: SYSTEMS THINKING: KEY IDEA 1: THROUGH SYSTEMS THINKING, PEOPLE CAN RECOGNIZE THE COMMONALITIES THAT EXIST AMONG ALL SYSTEMS AND HOW PARTS OF A SYSTEM INTERRELATE AND COMBINE TO PERFORM SPECIFIC FUNCTIONS.

STANDARD 6: MODELS: KEY IDEA 2: MODELS ARE SIMPLIFIED REPRESENTATIONS OF OBJECTS, STRUCTURES, OR SYSTEMS USED IN ANALYSIS, EXPLANATION, INTERPRETATION, OR DESIGN.

STANDARD 6: MAGNITUDE & SCALE: KEY IDEA 3: THE GROUPING OF MAGNITUDES OF SIZE, TIME, FREQUENCY, AND PRESSURES OR OTHER UNITS OF MEASUREMENT INTO A SERIES OF RELATIVE ORDER PROVIDES A USEFUL WAY TO DEAL WITH THE IMMENSE RANGE AND THE CHANGES IN SCALE THAT AFFECT THE BEHAVIOR AND DESIGN OF SYSTEMS.