Houghton Mifflin Harcourt

Modern Chemistry

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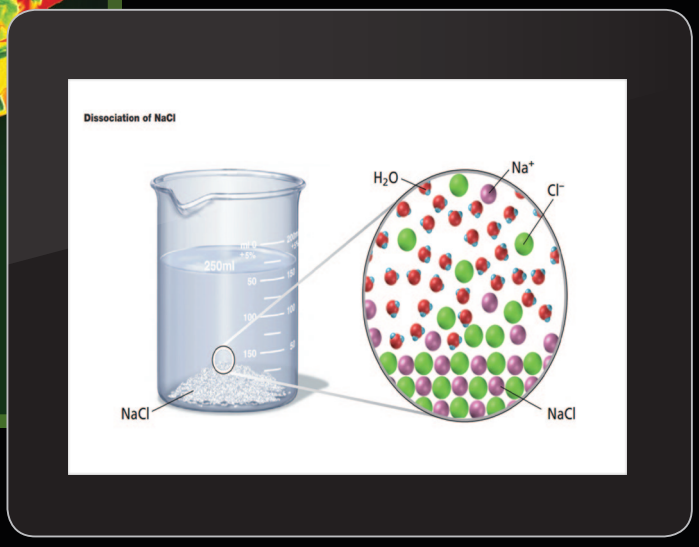
Featuring connections to THING EXPLAINER &
Google Expeditions



“Education is the most powerful tool which you can use to change the world.”

— Nelson Mandela

HMH *Modern Chemistry*® empowers teachers to deliver effective, engaging, and motivating instruction with an abundance of print and digital resources, including rich multimedia, animations and simulations.

Try it now!

1	**Go to:**	preview.hrw.com
2	**Enter Sample Word:**	HSNASC17
3	**Enter your registration information, select “Register” and follow the on-screen instructions to receive your credentials and get started**	

Dashboard

Classrooms using ***Modern Chemistry* © 2017** will now have the benefit of the **new and improved** online interface provided by the HMH Dashboard. This also includes *my*SmartPlanner, enabling teachers to combine calendar functionality with curriculum mapping and program resources.

#HMH**Science**

Everything you need—now in one convenient online location!

The Interactive Online Edition gives students and teachers 24/7 point-of-use access to all program components.

Why it Matters

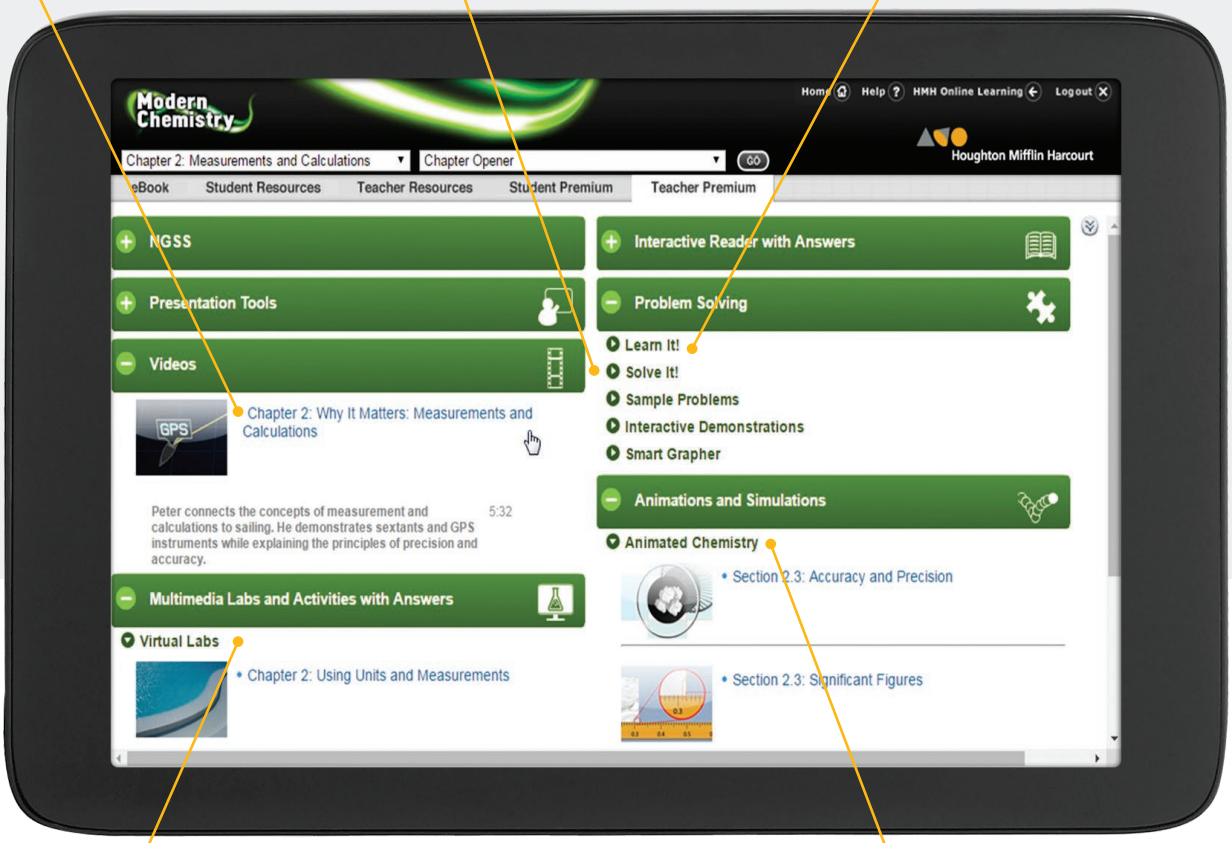
Each chapter opens with a dynamic video that relates the content to everyday life.

Solve It! Cards

Portable reference cards offer quick access to strategies for solving almost any chemistry problem.

Learn It! Videos

Tutorial videos walk students through challenging problems and offer tips for success.

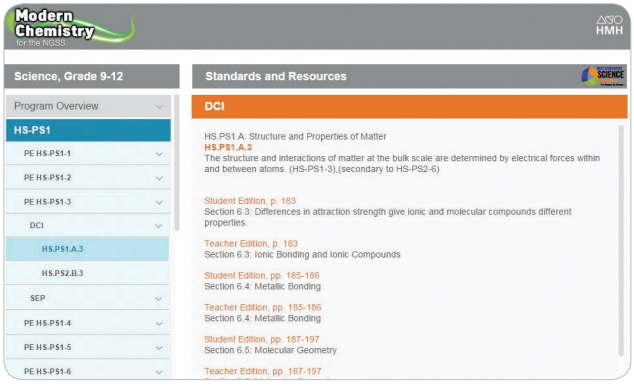


Virtual Labs

Students can conduct meaningful experiments in a simulated lab or field setting without the expense, time, or risk of traditional lab settings.

Animated Chemistry

Animations and simulations help students visualize and comprehend complex concepts.



NGSS* Correlations

Correlations both online and in the TE facilitate standards implementation.

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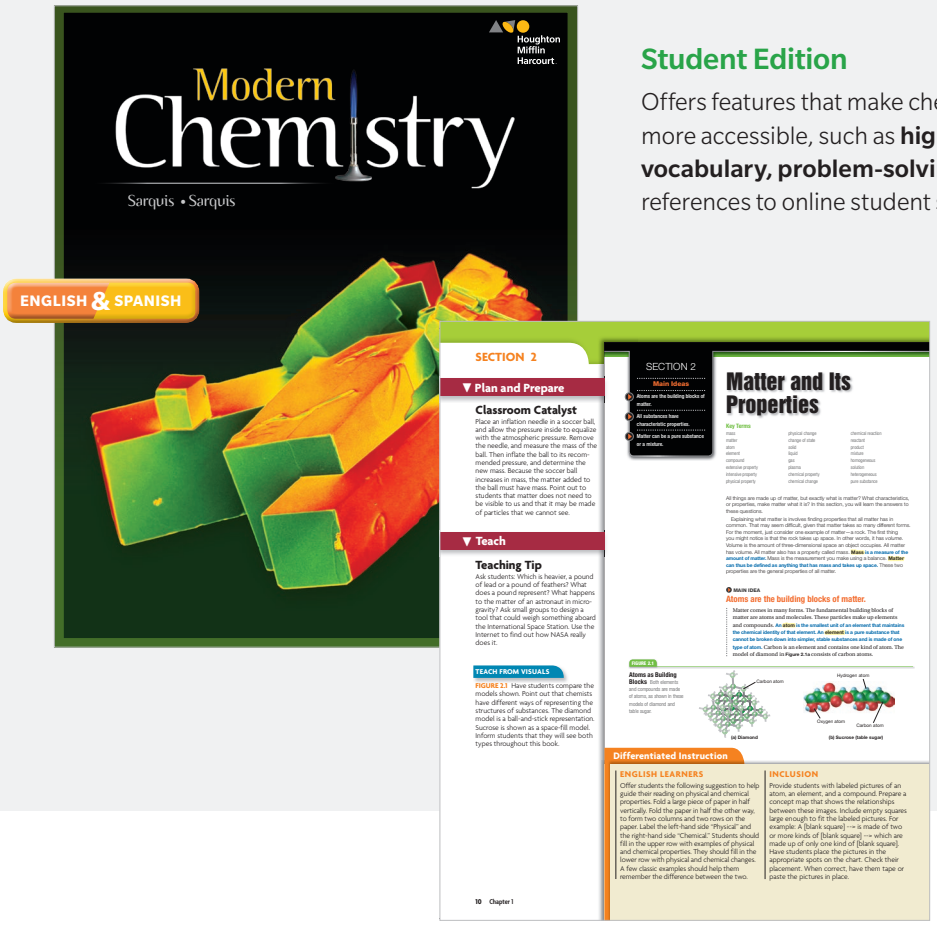
Print components designed and aligned for easy access

HMH *Modern Chemistry* enables you to reach all learners by providing time-saving, easy-to-use resources to help students of all abilities achieve understanding and success.



Student Edition

Offers features that make chemistry concepts more accessible, such as **highlighted vocabulary, problem-solving support,** and references to online student support tools.

Teacher Edition

Packed with a wide variety of **strategies** to help all students master chemistry concepts, plus **extended learning** opportunities for advanced students.

Dr. Jerry Sarquis, Professor *Emeritus*, Chemistry Education, Miami University

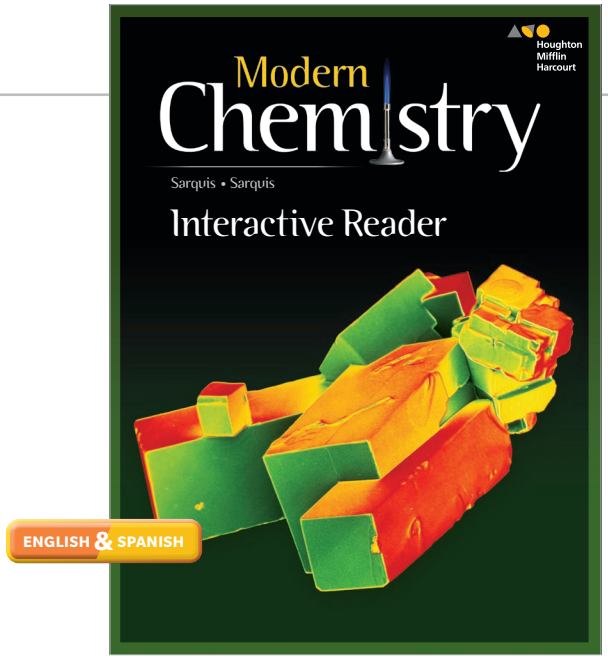
Mickey Sarquis, Professor *Emerita*, Chemistry Education, Miami University

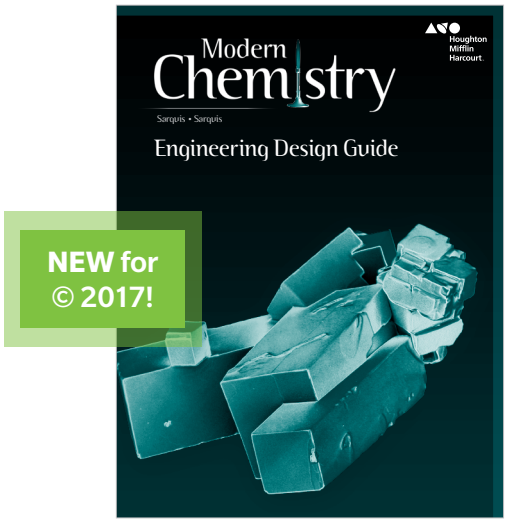
Meet the Authors

Dr. Jerry Sarquis and **Mickey Sarquis** were both professors in the Department of Chemistry at Miami University in Oxford, Ohio. These renowned authors were motivated to contribute to ***Modern Chemistry*** because they had a desire to give back to the community, and they wanted to influence students whom they couldn't even see, through the unfolding of a textbook and all the resources that support such a book. Jerry and Mickey Sarquis got into teaching because of their love of learning, and the more they taught, the more they learned from their interactions with their students.

Interactive Reader and Answer Key

A **write-in worktext** that provides all of the essential content and vocabulary of the Student Edition at a reading level one to two grades below the text. A great resource for students of all ability levels, the Interactive Reader is both a core instructional tool for **struggling students** and a useful **study guide** for all students. The Answer Key provides teacher notes and answers for every section of the Interactive Reader.

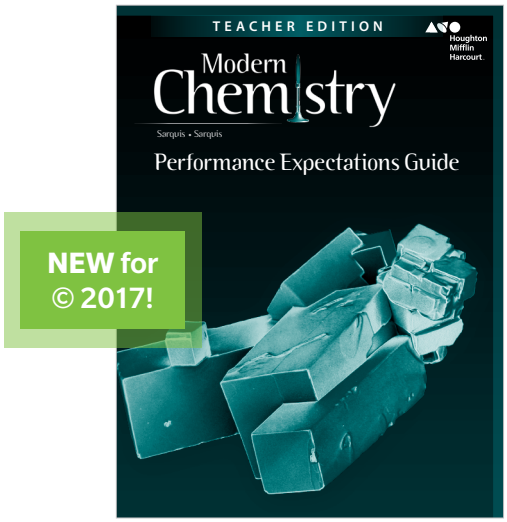




Engineering Design Guide

Student Edition and Teacher Edition

This Engineering Design Guide provides an overview of the **engineering design process**, along with activities and checklists that can help foster students' **critical-thinking** and **problem-solving skills**. For curriculums aligned to NGSS*, this guide can also help support the engineering-related Performance Expectations.



Performance Expectations Guide

Student Edition and Teacher Edition

Designed to integrate easily into any curriculum, a separate Performance Expectations Guide is available to ensure that students meet the NGSS Performance Expectations. Also included is an **overview of NGSS** and **teacher tips** for integrating each activity into the classroom.

NEXT GENERATION SCIENCE STANDARDS

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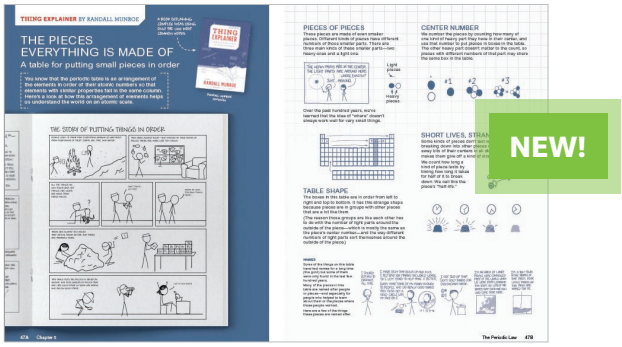
Print and Digital Tools that Motivate and Engage

HMH *Modern Chemistry* offers the latest print and multimedia resources that speak directly to your students in a visual language they understand—ensuring that they will stay engaged.

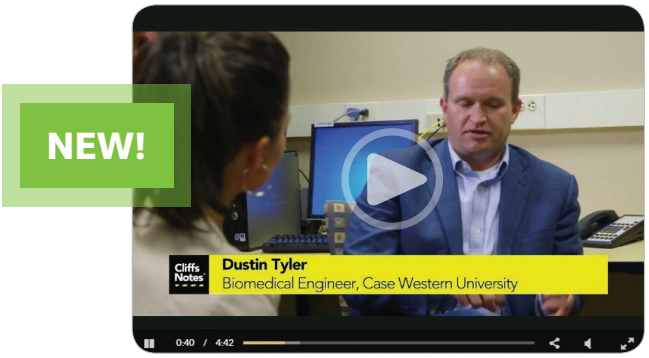
Thing Explainer

Through an exclusive partnership with author and Internet sensation **Randall Munroe**, HMH has incorporated highly engaging and educational material from Randall's latest book, *Thing Explainer,* into our print and digital editions. Randall's webcomic style, as seen on **xkcd.com**, humorously explains complex topics in easy-to-understand language.



HMH Field Trips powered by Google Expeditions

As a Google® content partner, HMH® has developed K–12 field trips for Google Expeditions. Using a virtual reality viewer—like Google Cardboard™—and a smartphone, students are swept away into immersive virtual worlds where learning and engagement are maximized. These virtual field trips are 3D, 360-degree panoramas from fascinating locations, directly tied to science content! An **HMH Teacher Guide** provides ideas for incorporating the Expeditions into your lessons, as well as tips on how to guide and customize the experience.

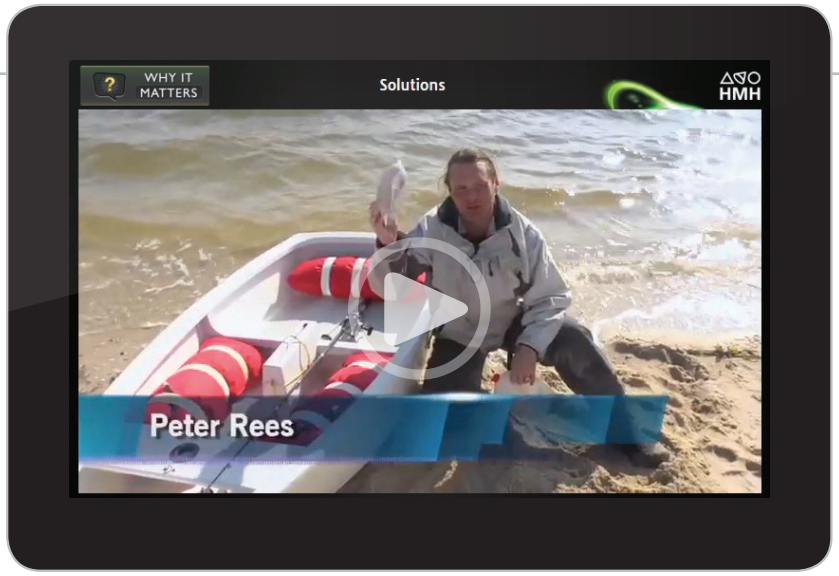


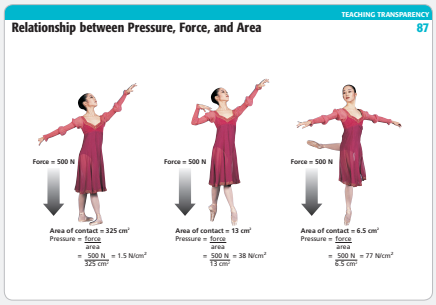
On the Job STEM Videos

As part of our Premium, Hybrid, Digital Enhanced, and Class Set offerings offering, HMH now includes 29 *On the Job* STEM videos that **profile STEM careers** in today's fastest-growing industries. Our energetic hosts shadow passionate professionals in a day "on the job." These short segments are inspirational and entertaining with the hosts actually performing parts of the job! These videos will **motivate students** to enter emerging STEM fields.

Why It Matters Videos

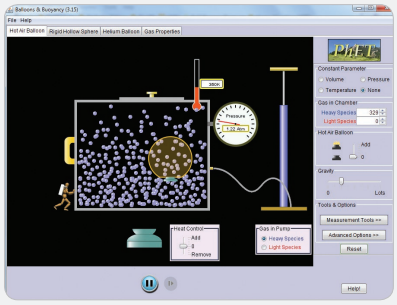
Seventeen chapter-introductory videos are an effective way to **begin a new topic** of chemistry study. Each video is designed to take the content of the chapter and **relate it to everyday objects or situations** that are familiar to students.





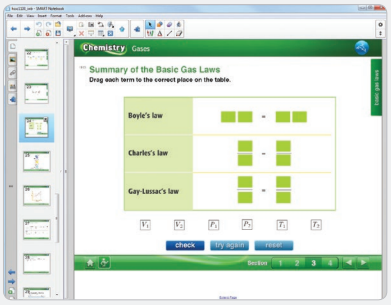
Teaching Visuals

Digital versions of key illustrations and diagrams are ideal for **whole-class instruction.**



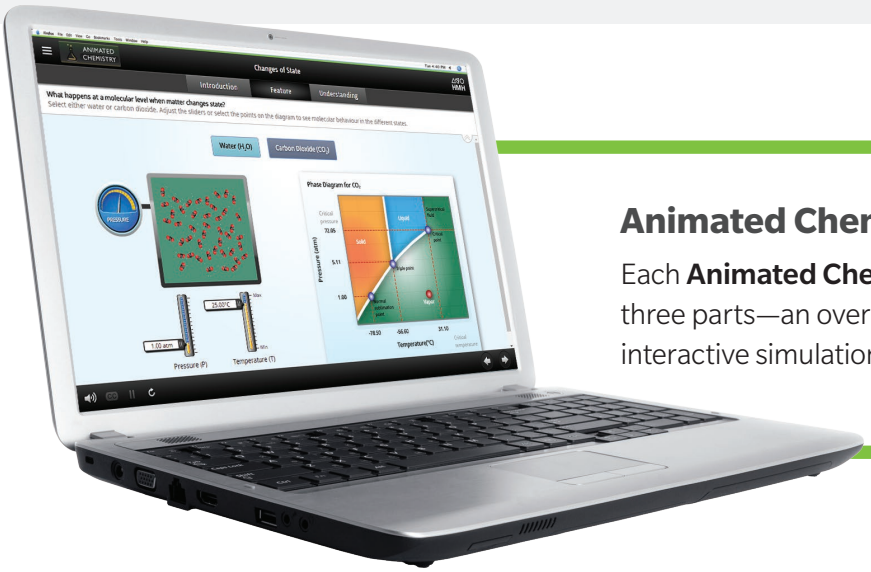
PhET Simulations

Interactive online simulations produced under Creative Commons licensing by the University of Colorado at Boulder. They provide fun, interactive, **research-based simulations** of real-life phenomena.



Interactive Whiteboard Resources

IWB resources include interactive **teaching visuals** and **content-reinforcement lessons** for each chapter of the textbook in SMART Notebook™ and ActivInspire® Flipchart formats.

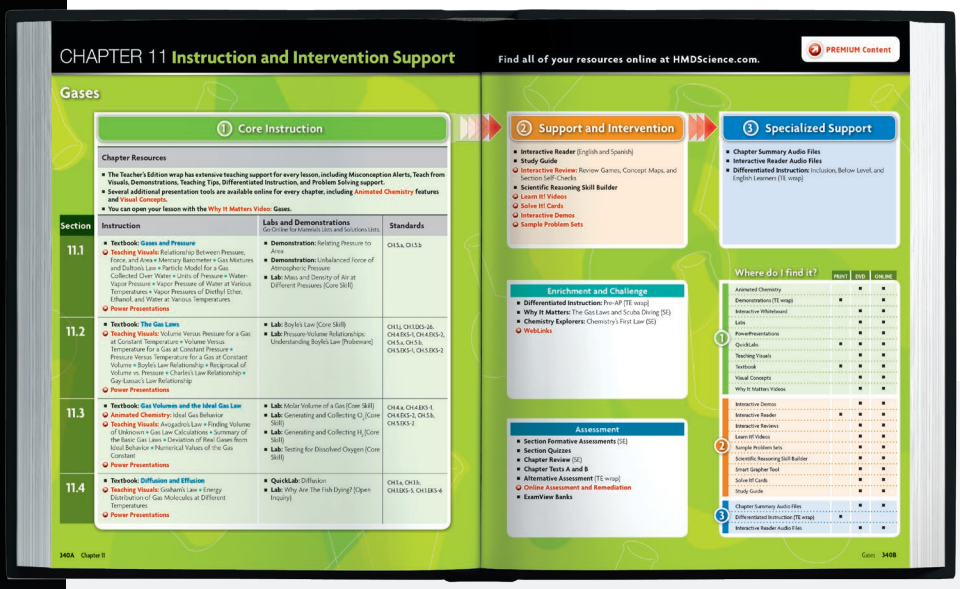


Animated Chemistry

Each **Animated Chemistry** simulation includes three parts—an overview of the concept, an interactive simulation, and an assessment.

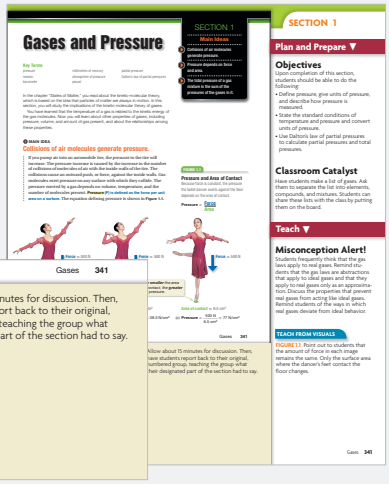
Unparalleled resources for Differentiated Instruction

Students approach chemistry with a wide variety of skills and levels of preparation. HMH *Modern Chemistry* provides you with the tools you need to help all students succeed.

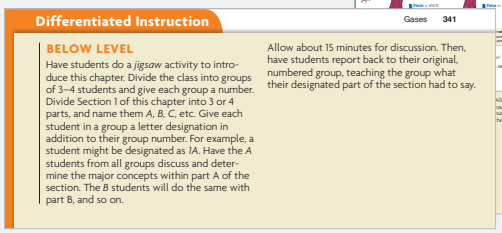


Teacher Edition

The **Instruction and Intervention** feature located in each chapter of the Teacher Edition provides **strategies for every lesson** to assist you in helping students with a wide range of needs. To simplify lesson planning, these support pages at the beginning of each chapter provide a full listing of the activities and classroom resources available for each section.

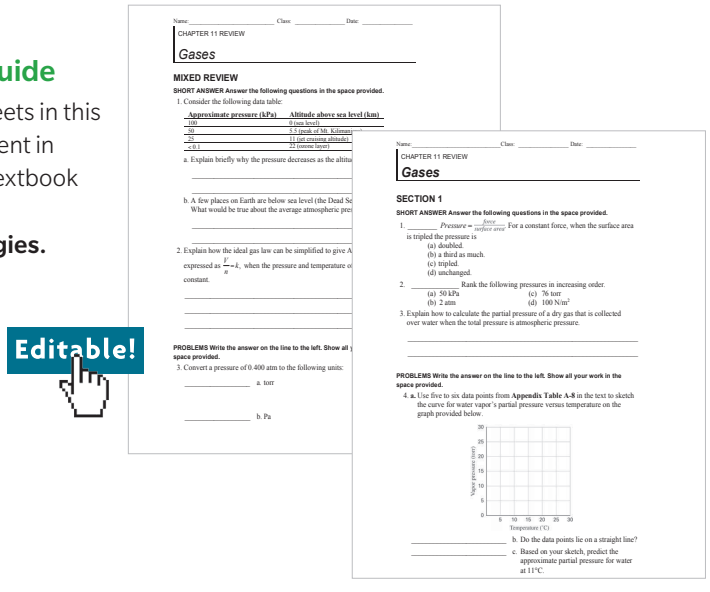


The wrap margin includes a **Differentiated Instruction** feature with a wide variety of strategies to help all students master chemistry concepts. Material categories include Below Level, English Learners, Pre-AP®, and Inclusion.



Chapter and Section Study Guide

The student worksheets in this guide cover the content in each section of the textbook using a **variety of questioning strategies.**



Interactive Reader Audio Files

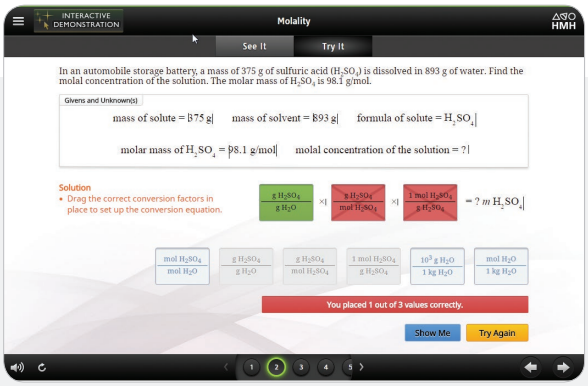
The entire Interactive Reader has been professionally read and is available to students to help **bolster learning comprehension.**

and Problem Solving

Nearly half of the sample problems in HMH *Modern Chemistry* have been refreshed to give even the most loyal program users something new and different to challenge and strengthen their students' problem-solving skills.

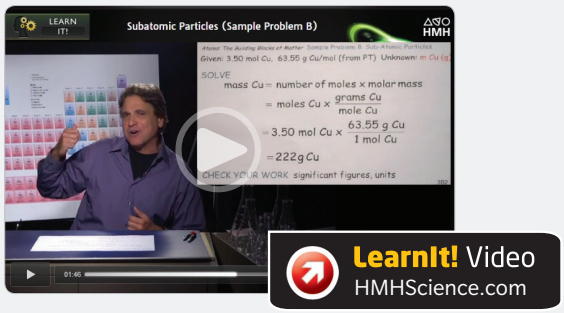
Solution Tutor

Guides students step-by-step through selected problems, recognizes their error patterns, then provides hints and targeted remediation to improve their problem-solving skills.



Interactive Demonstrations

Each sample problem in the textbook has an accompanying **Interactive Demonstration** that **walks through the steps of solving** that type of chemistry problem. The **Try It Yourself** feature helps students apply what they have learned. Each includes a full audio narrative.

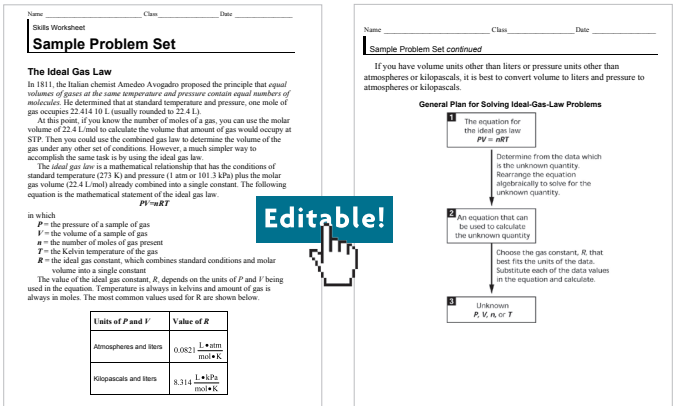


Learn It! Videos

Forty professional tutorial videos **walk students through challenging chemistry problems**, with tips and strategies for success.

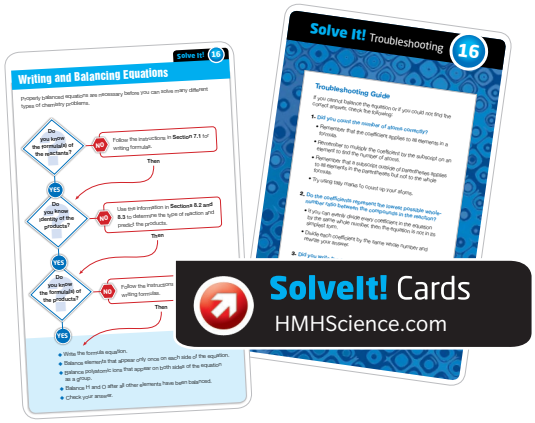
Sample Problem Sets

These skill worksheets provide **problem-solving strategies** and an extensive bank of student **practice problems** for every type of chemistry problem in the textbook.



Solve It! Cards

These printable and **portable reference cards** provide students with quick access to effective problem-solving strategies and guidelines.



Wide-ranging support for Reading and Vocabulary

Your students will get the most out of their reading with numerous print and multimedia point-of-use resources that enable them to build understanding and retain more information on key concepts.

NEW!

Student Edition

Big Ideas in every Chapter Opener & Summary help students concentrate on key concepts.

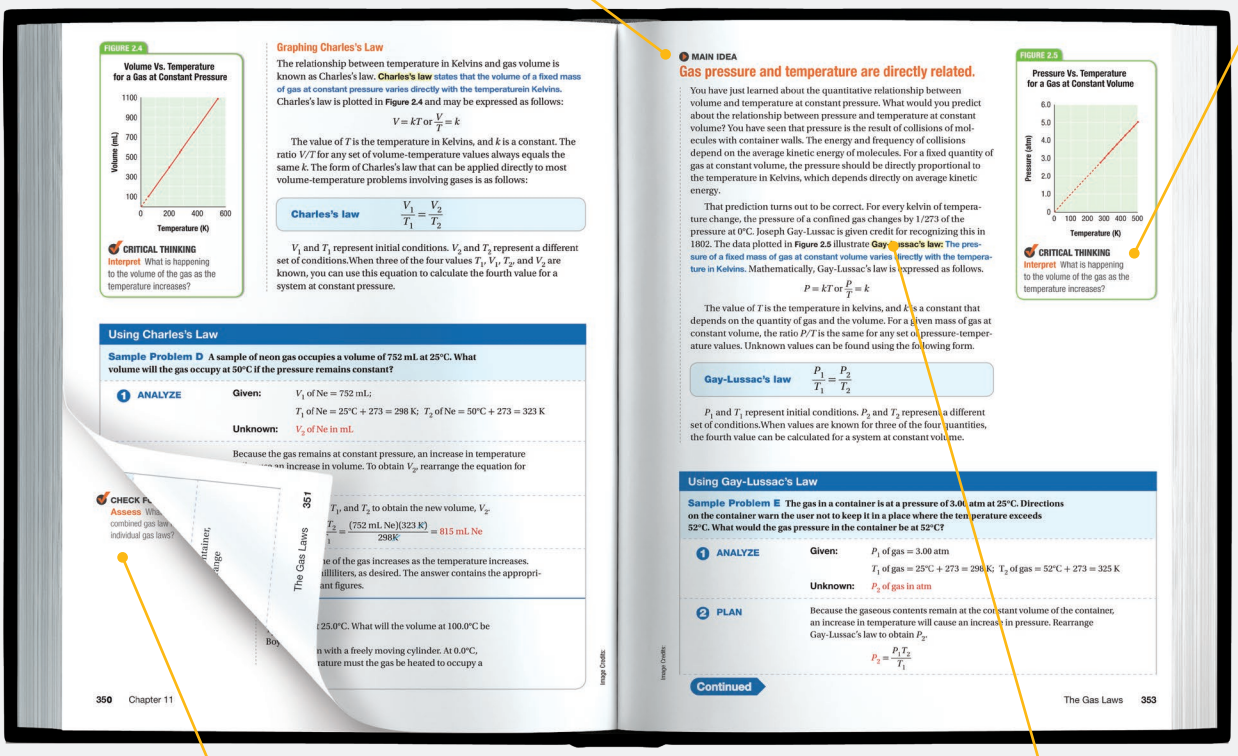
Main Idea

Chapter content has been organized around main ideas.

Critical Thinking

Critical-Thinking questions prompt your students to think deeply.

CRITICAL THINKING
Interpret What is happening to the volume of the gas as the temperature increases?



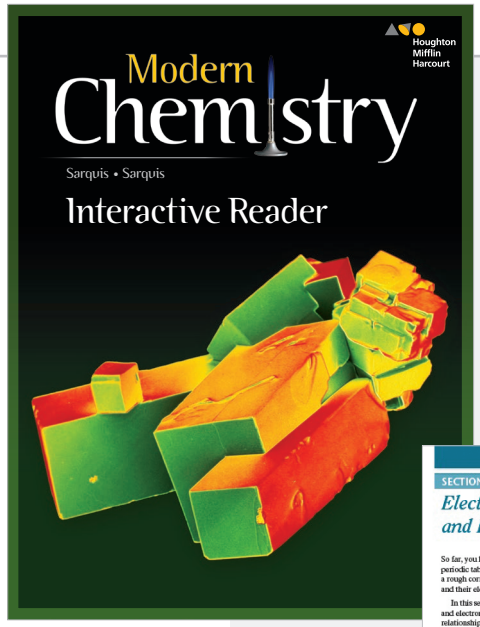
CHECK FOR UNDERSTANDING
Assess What advantage does the combined gas law have over the three individual gas laws?

Check for Understanding

These reading-comprehension questions help reinforce the important points of the section.

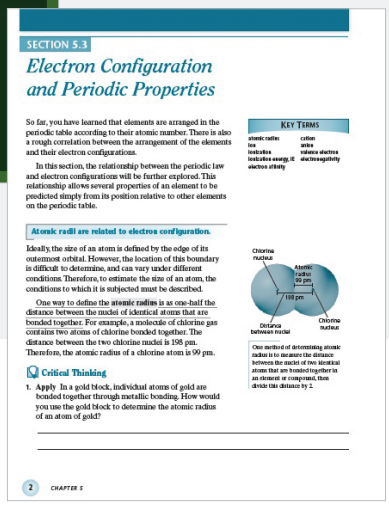
In-text definitions

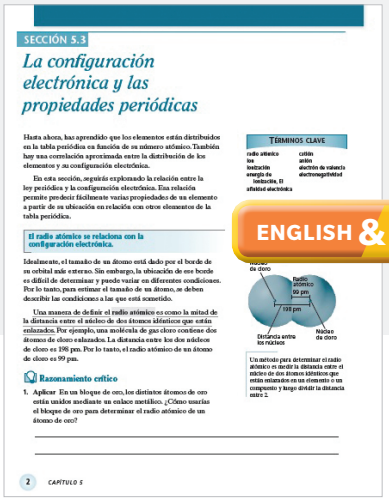
As students study, they'll find key vocabulary has been highlighted in context.



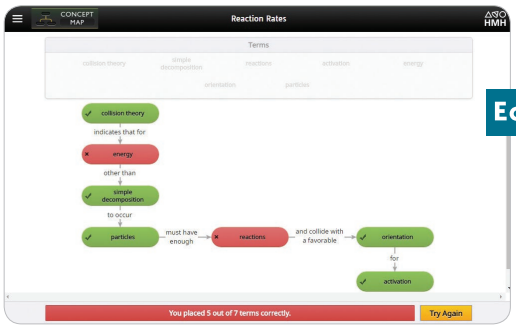
Interactive Reader

This write-in worktext presents all the vocabulary and essential content from the textbook in a lower-level, **easy-to-read** text, with instructional visuals and frequent comprehension checks. This unique component is a great tool for all students—the core content for struggling students and a useful **study guide** for others.


SECTION 5.3
Electron Configuration and Periodic Properties
KEY TERMS
Atomic radii are related to electron configuration.
Critical Thinking
1. Apply In a gold block, individual atoms of gold are bonded together through metallic bonding. How would you use the gold block to determine the atomic radius of an atom of gold?


SECCIÓN 5.3
La configuración electrónica y las propiedades periódicas
TÉRMINOS CLAVE
El radio atómico se relaciona con la configuración electrónica.
Razonamiento crítico
1. Aplicar En un bloque de oro, los distintos átomos de oro están unidos mediante un enlace metálico. ¿Cómo usarías el bloque de oro para determinar el radio atómico de un átomo de oro?

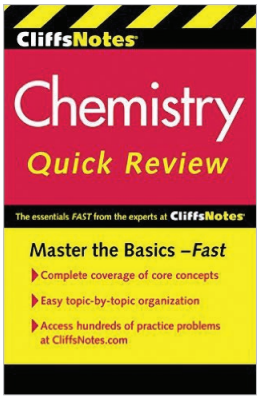
ENGLISH & SPANISH



Editable!

Interactive Concept Maps

Each chapter includes an interactive, advanced **graphic organizer** that shows the relationships among concepts covered and helps students develop logical thinking and study skills.



CliffsNotes® Chemistry Quick Review

With a Premium package purchase, a class set of these study guides provides **essential reinforcement of core concepts** in an easy-to-use format.

eBook

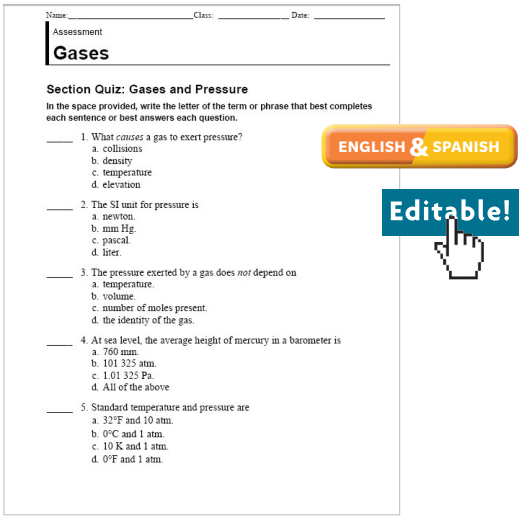
This **online version** of the print Student Edition features a wealth of **built-in tools** to help students access the content, including the chunking of content around Main Ideas, with frequent comprehension checks, superior support for problem solving, high-quality instructional visuals, point-of-use references to online animations, Problem-Solving tutorials, and virtual labs that make abstract concepts more concrete. Features include data persistence, on-page media links, bookmarking, search, notes, and highlighting functionality.

Flexible Assessment Tools to Track Student Progress

The comprehensive assessment options located on HMHScience.com bring together all HMH *Modern Chemistry* assessment tools into one convenient place, giving you many choices for the best way to assess your students' learning.

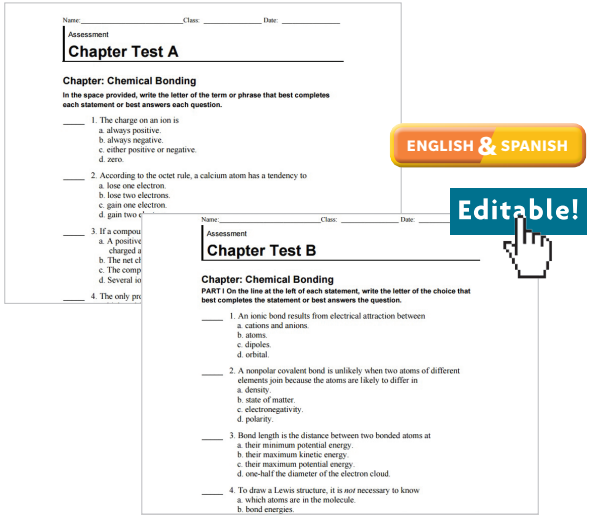
ExamView® Banks

A complete ExamView Software Suite includes all assessment questions for the program and more than **2,300 additional questions** in Bonus Banks.



Section Quizzes

A 10-question multiple-choice and short-answer quiz for each section of the textbook. These are designed for student **formative assessment** to aid in remediation.

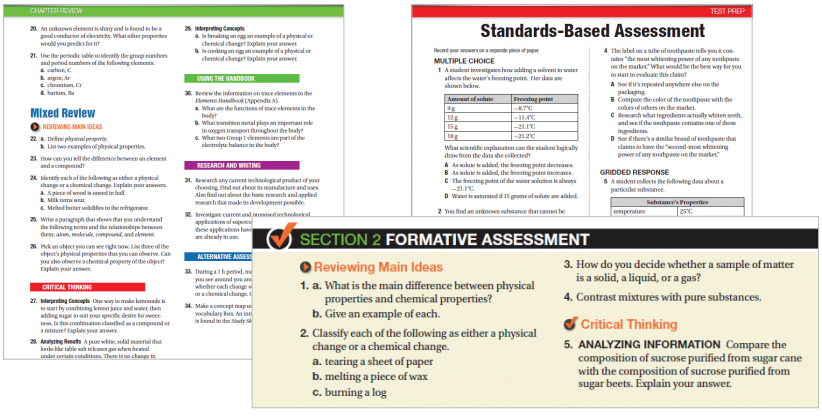


Chapter Tests A & B

Two **full-length** chapter tests include multiple-choice and short-answer questions. Test B is similar to but more challenging than Test A.

Review and Assessment in the Student Edition

The Student Edition contains **multiple levels of assessment** from Formative to Summative, along with helpful review questions that assess students' understanding of chapter and section material.

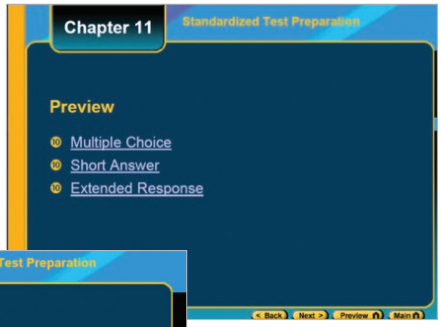


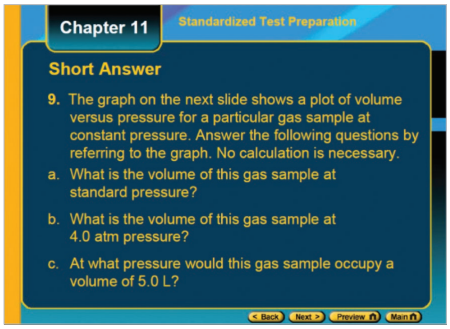
Interactive Review Games

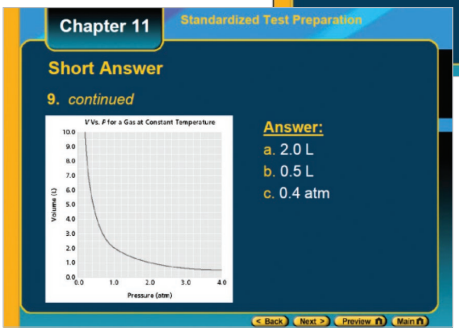
Three different styles of vocabulary and concept review games help reinforce the material learned in each chapter in a fun and engaging format.

PowerPresentations: Standardized Test Preparation

Multiple-Choice, Short-Answer, and Extended-Response questions that you can use for **whole-class review** of chapter materials.





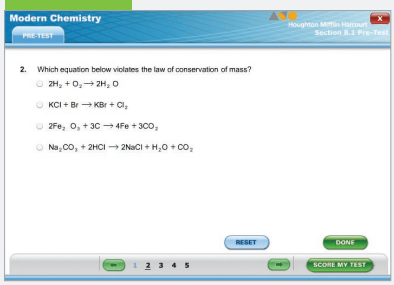


Online Assessment and Remediation

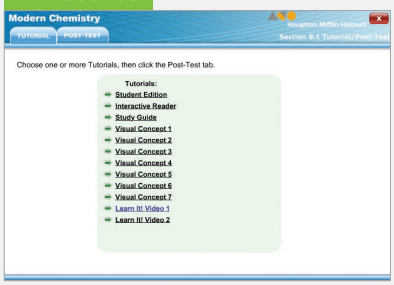
An advanced, automated assessment and remediation engine enables teachers to assign section quizzes to students. The assessments are **automatically graded**, and remediation that uses materials from the program is prescribed. A post-test is offered to determine student mastery. Critical student **performance data** are recorded and made readily available to the teacher.

Individualized Remediation

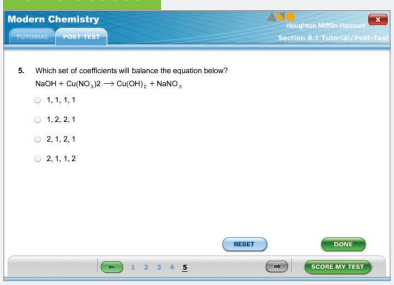
1 Assess



2 Prescribe



3 Re-assess



Convenient access to Labs, Data Analysis and STEM

HMH *Modern Chemistry* includes the most comprehensive lab resources with its wide variety of print and digital lab options for every classroom, along with the most robust data-analysis strand to help students develop these critical skills.

Over 200 Editable Labs!

Laboratory Experiments

Wide variety of labs located at point of use on **HMHScience.com**:

- Editable lab sheets
- Teacher notes and answer keys
- Referenced on Instruction and Intervention pages in Teacher Edition

QuickLabs

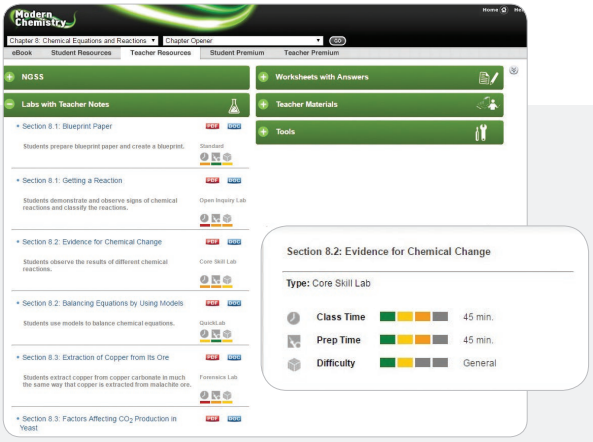
Designed for reinforcement of key concepts using easy-to-obtain materials

Standard Labs

Focus on experimental skills and application of chapter concepts through the use of scientific methods

Core Skill Labs

Provide practice of inquiry skills and scientific methods

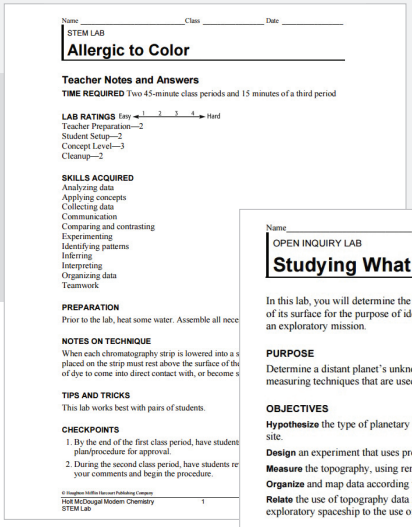


Labeled Labs

Lab activities are labeled online by **class time**, **prep time**, and **difficulty** to help teachers choose appropriate activities to fit their classroom needs.

STEM Labs

Science, Technology, Engineering, and Mathematics problem-based labs that emphasize inquiry and the engineering design process


Name _____ Class _____ Date _____
STEM LAB
Allergic to Color
Teacher Notes and Answers
TIME REQUIRED Two 45-minute class periods and 15 minutes of a third period
LAB RATINGS Easy 1 2 3 4 Hard
Teacher Preparation—2
Student Setup—2
Concept Level—3
Cleanup—2
SKILLS ACQUIRED
Analyzing data
Applying concepts
Collecting data
Communication
Comparing and contrasting
Experimenting
Identifying patterns
Inferring
Interpreting
Organizing data
Teamwork
PREPARATION
Prior to the lab, heat some water. Assemble all nece
NOTES ON TECHNIQUE
When each chromatography strip is lowered into a s
placed on the strip must rest above the surface of th
of dye to come into direct contact with, or become s
TIPS AND TRICKS
This lab works best with pairs of students.
CHECKPOINTS
1. By the end of the first class period, have student
plan/procedure for approval.
2. During the second class period, have students re
your comments and begin the procedure.
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Holt McDougal Modern Chemistry
STEM Lab
1

STEM labs

Open Inquiry Labs

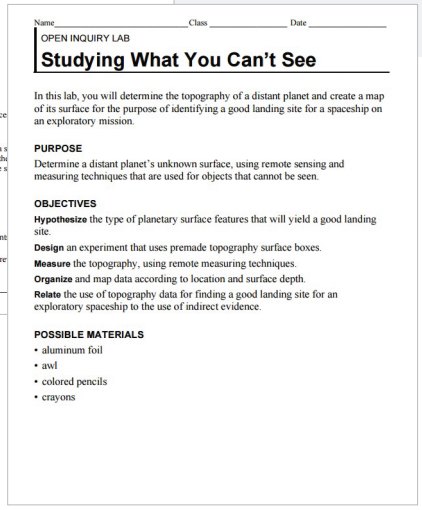
Specifically designed to be short project-based labs that encourage students to collaborate, strategize, construct, and evaluate a lab challenge of their own creation

Probeware Labs

Labs that use Vernier® probeware and Pasco® probeware and SPARK® technology

Forensic Labs

Application labs that have students demonstrating laboratory skills through the exploration of forensic and applied science scenarios


Name _____ Class _____ Date _____
OPEN INQUIRY LAB
Studying What You Can't See
In this lab, you will determine the topography of a distant planet and create a map of its surface for the purpose of identifying a good landing site for a spaceship on an exploratory mission.
PURPOSE
Determine a distant planet's unknown surface, using remote sensing and measuring techniques that are used for objects that cannot be seen.
OBJECTIVES
Hypothesize the type of planetary surface features that will yield a good landing site.
Design an experiment that uses premade topography surface boxes.
Measure the topography, using remote measuring techniques.
Organize and map data according to location and surface depth.
Relate the use of topography data for finding a good landing site for an exploratory spaceship to the use of indirect evidence.
POSSIBLE MATERIALS
- aluminum foil
- awl
- colored pencils
- crayons

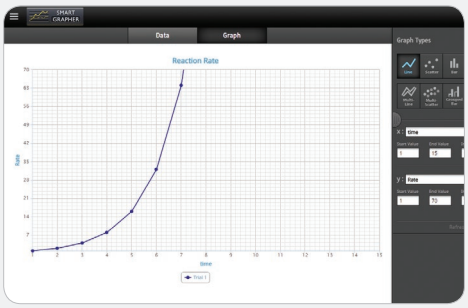
Inquiry labs

S.T.E.M. in the Student Edition

Select STEM features include an Engineering Design feature in the Student Edition. This feature encourages students to follow the **engineering design process** and think about problems in an innovative way.

Data Analysis Support for Students

To help students develop the data analysis skills necessary to collect, graph, and analyze data like scientists, **HMHScience.com** includes resources to support the data analysis lesson in every chapter.



Smart Grapher

A powerful, easy-to-use **online graphing tool** that encourages students to use their own data to create line graphs, circle graphs, and more.

Scientific Reasoning Skill Builder

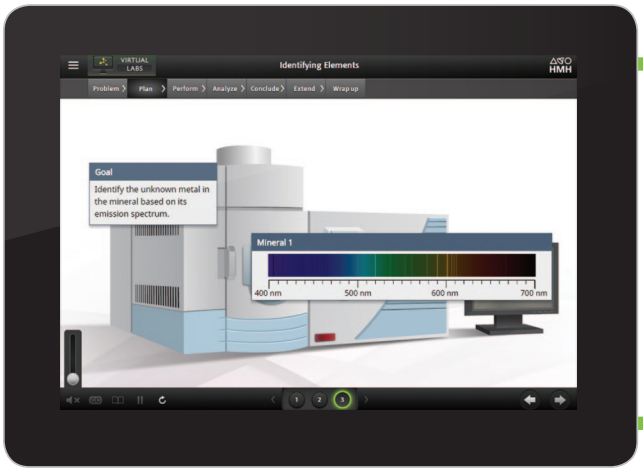
Over **100 exercises** that strengthen students' scientific-reasoning skills. Sample topics include classifying and categorizing, cause-and-effect relationships, hypothesis, generalizations and analogies, and summarizing and reviewing.

Pre-Lab Procedures

This resource provides **Teacher Resource Pages** and worksheets to help students develop the skills necessary to complete chapter labs.

Graphing Calculator Activities

HMH has partnered with Texas Instruments® to present nine **graphing activities** for use with the TI-Nspire® graphing calculator.



Virtual Labs

Students can hone their lab skills in a virtual environment. Fun, safe, and highly interactive, these labs focus on experiments for which equipment and materials are often expensive or difficult to acquire.

Modern Chemistry

Join the conversation!
#HMHScience

The © **2017 *Modern Chemistry*** program is available in five configurations: Premium, Hybrid, Digital, Digital Enhanced, and Class Set packages. The Hybrid bundle is the base option, with the print Student Edition and Teacher Edition, the student eBook, and all worksheets, labs, and Spanish resources. The Premium bundle provides added print resources such as Interactive Readers and CliffsNotes Study Guides. Digital bundles offer a low-cost digital-only option. The Premium, Hybrid, Class Set, and Digital Enhanced bundles include the On the Job STEM videos and rich multimedia, animations, and simulations. Common Cartridge® options are also available for purchase.

	Student*** ■ Teacher ■	Print	Digital
Student Edition		■	■
Teacher Edition		■	■
Interactive Reader (and Answer Key for Teacher)** • Online Audio Files (English only)		■ ■	■ ■
Performance Expectations Guide SE/TE		■ ■	■ ■
Engineering Design Guide SE/TE		■ ■	■ ■
CliffsNotes Chemistry Quick Review (with Premium package only)		■	
Interactive Online Edition			
• NGSS* Correlation Tool			■
• Teacher Guide for Google Expeditions			■
• Student eBook: Chapter Summaries Audio files and SE pages**			■
• Worksheets (Section Study Guides, Chapter Study Guides, Graphing Calculator Activities)			■
• Labs** (STEM, Open Inquiry, QuickLabs, Standard, Challenge, Biotechnology, Probeware, Forensic, Virtual Labs)			■
• Lab Resources (Labs with Teacher Notes, Laboratory Manager's Professional Reference, Probeware Instruction Sheet, Pre-Lab Procedures, Comprehensive Materials List, Graphing Calculator Instructions)			■
• Student Toolkit (Scientific Reasoning Skill Builder, Project Resources, Smart Grapher, FoldNotes, Periodic Table, Glossary, Scientific Calculator, Graphing Calculator)			■
• Teacher Toolkit (Teaching Strategies, Classroom Management Resources, Lesson Plans, Project Resources)			■
• Multimedia and Activities (Animated Chemistry, PhET Simulations, Virtual Labs, Why it Matters Videos, Weblinks)			■
• Presentation Tools (Teaching Visuals, Interactive Whiteboard Resources, PowerPresentations)			■
• *On the Job* STEM Videos (with Premium, Hybrid, Digital Enhanced, and Class Set packages only)			■
• Problem Solving Support (Learn It! Videos, Solve It! Cards, Sample Problem Sets, Interactive Demonstrations, Solution Tutor)			■
• Interactive Review (Interactive Concept Maps, Interactive Review Games)			■
• Online Assessments (ExamView, Section Quizzes, Chapter Tests A&B, Online Assessment with Remediation)			■

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**Also available in Spanish. ***All of the student-facing resources are available to the teacher via the Teacher's Interactive Online Edition.

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