

GLENCOE

CHEMISTRY

MATTER AND CHANGE

Transform Your Classroom!



mheonline.com

Transform Your Classroom!

Chemistry Matter and Change: Leveraging technology to drive personalized student success while engaging and motivating students with hands-on, project-based activities and real-world applications.

The increased pace of change in education in the last few years has created seismic shifts in the delivery and consumption of educational materials. Students want to connect what they learn in the classroom to what they see happening in the real world – today!

Helping students draw these parallels and keeping them engaged is what McGraw-Hill Education is all about. Only McGraw-Hill Education provides you with a math-based chemistry curriculum that is both rigorous and accessible.

We deliver to you the most effective, innovative, and inspiring high school chemistry curriculum that meets both Next Generation Science Standards (NGSS) and local science standards.

This innovative program is adaptive, engaging, intuitive, and rigorous. *Chemistry Matter and Change* offers you a digital-first or hybrid digital-print program, differentiation support, point-of-use resources, and so much more to transform your classroom into an exciting and engaging science learning center!

Chemistry Matter and Change, coupled with real-world concepts, helps you ignite curiosity in your students. Alongside dynamic photography, powerful diagrams, and compelling examples, keeps students excited about chemistry from lesson-to-lesson.


Motivate students to engage real-world problems with these interactive digital tools:

- **Concepts-in-Motion**
- ***Science and Engineering Practices Handbook***
- **Virtual Investigations**
- **Project-Based Learning Activities (PBLs) and Applying Practices Worksheets**
- **WebQuests**

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*Next Generation Science Standards is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards was involved in the production of, and does not endorse, this product.

A young girl with dark skin and short, curly hair is the central figure. She is wearing a purple and white plaid button-down shirt over a green backpack. She is looking upwards and to the right with a hopeful expression. In the background, a boy in a blue shirt and striped shorts is walking away, also carrying a backpack. The setting is a dense forest with tall, thin trees and green foliage on the ground.

**We firmly believe that
the betterment of people,
communities, and the world is
grounded in education without
limits – exclusive to no one,
personalized to everyone.**



RAMP UP THE ENGAGEMENT...

With Interactive Learning

Motivate your students with hands-on, project-based activities and real-world application. These program resources ramp up your students' engagement with chemistry like never before!

- **Student eBook** with highlighter and note-taking tools.
- ***Sciences and Engineering Practices Handbook*** with accurate reference material and real-world examples.
- **Online Personal Tutor** to guide students through select chemistry content.
- **ConnectED Mobile** gives you the ability to manage all your teaching content offline.

Engaging Student Resources

Give your students the resources they need to maximize chemistry-in-action! The **Student eBook** helps students turn chemistry in the real world into learning moments by giving students access to their program materials and resources anytime and anywhere.

Empower students to learn from chemistry as-it-happens with the **Student eBook** which learners can access anytime and anywhere using the Open eBook icon.

Help students build active learning skills using these interactive tools:

- Step-by-step example problems with coaching notes and practice problems at point-of-use.
- Highlighter and note-taking tools.
- Worksheets and digital asset links in **ConnectED**.

The **ConnectED Mobile** app gives you complete access to your eBook, alongside planning tools, reference materials, and other program resources. **ConnectED Mobile** is available on select iOS and Android™ devices.

The image displays the 'Virtual Investigations' interface. At the top, there are tabs for 'Laboratory', 'Conceptual Activity', and 'Quantitative Activity'. Below these is a periodic table with elements color-coded by groups. To the right, a green banner reads 'Decoding the Periodic Table'. Below the periodic table, there is a section titled 'Exploration 1'. In the foreground, a tablet displays the 'Student eBook' content, which includes text about the ionization of hydrocyanic acid, a chemical equation, and a table of ionization constants for weak acids.

Table 4 Ionization Constants for Weak Acids

Acid	Ionization Equation	K_a (298 K)
Hydrofluoric, first ionization	$\text{HF} \rightleftharpoons \text{H}^+ + \text{F}^-$	6.9×10^{-4}

The eBook in ConnectED Mobile is available offline for home use if students do not have access to the web.

Real-world Connections

Be confident helping students achieve more! Use the *Science and Engineering Practices Handbook* to introduce the practices to students and support their scientific investigations and engineering projects.

A reference book, the *Science and Engineering Practices Handbook* provides students with background information, definitions, examples, and Quick Practice activities to stimulate learning through practice.

The *Science and Engineering Practices Handbook* is an easy-to-use reference for all eight practices.

1. Asking questions (for science) and defining problems (for engineering).
2. Developing and using models.
3. Planning and carrying out investigations.
4. Analyzing and interpreting data.
5. Using mathematics and computational thinking.
6. Constructing explanations (for science) and designing solutions (for engineering).
7. Engaging in argument from evidence.
8. Obtaining, evaluating, and communicating information.

The image shows a composite of two digital resources. On the right is a screenshot of a chemistry website with a dark header featuring three beakers with colored flames (red, green, blue) and the word 'CHEMISTRY' in large white letters. Below the header is a navigation bar with links: 'Home', 'Plan & Present', 'Manage & Assign', 'Assess', and 'Resources'. A 'Lesson Search' box is visible, showing filters for 'ases' and 'acids and Bases'. On the right side of the website screenshot, a 'Results' section shows 'Results Per Page 12' and a thumbnail for the 'Science & Engineering Practices Handbook'. Below that is an 'Interactive Table' section with a link to 'Table 18.3 Ionization Equilibria'. On the left is a page from the 'Science and Engineering Practices Handbook'. The page title is 'Defining Problems'. The text explains that defining problems is an engineering practice that underlies any technological solution. It lists three components: 1. Engineers design solutions to problems. 2. Problem statements outline the problem and the solution. 3. Asking questions is part of engineering as well as science. It then discusses 'Seeking a Solution', where engineers identify problems for people and society and then design solutions to those problems. It gives the example of space suits worn by astronauts as technological solutions designed by engineers. It states that when coming up with any solution, engineers must consider many criteria. It defines 'Criteria' as requirements or specifications for a product to be successful. It gives the example of a space suit, where criteria may include the size of the person wearing it, how easy it is to move around in, and the temperatures it can withstand. It also states that engineers have certain constraints on every solution. It defines 'Constraints' as limitations on a product's design. It gives the example of materials that may not be durable enough or may be too expensive to use. It lists major constraints: time, energy, space, and the availability of tools and materials. It also lists other important constraints: the number of people working on the project, how much money is available for the project, and what information about the project exists. A photograph of an astronaut in a space suit is shown. Below the photo is a caption: 'Space suits have many criteria for safety and functionality.' At the bottom of the handbook page is a footer: 'Science and Engineering Practices • Asking Questions and Defining Problems 10 Copyright © McGraw-Hill Education. Permission is granted to reproduce for classroom use.'

Defining Problems

Defining problems is an engineering practice that underlies any technological solution. The different components of this practice are briefly summarized below.

1. Engineers design solutions to problems.
2. Problem statements outline the problem and the solution.
3. Asking questions is part of engineering as well as science.

Defining problems doesn't involve a dictionary or a math worksheet. Engineers study how people do things and try to make the experience better. If people don't have a way to do something yet, engineers invent it. Engineers have to consider many factors when defining a problem.

Seeking a Solution


Engineers identify problems for people and society and then design solutions to those problems. The solution could be a process, a system, or an object, such as a tool. Space suits worn by astronauts are technological solutions designed by engineers. When coming up with any solution, engineers must consider many criteria.

Criteria are requirements or specifications for a product to be successful.

Criteria for a space suit may include the size of the person wearing it, how easy it is to move around in, and the temperatures it can withstand. Engineers also have certain constraints on every solution.

Constraints are limitations on a product's design.

For example, some materials may not be durable enough or may be too expensive to use. Major constraints include time, energy, space, and the availability of tools and materials. Other important constraints are the number of people working on the project, how much money is available for the project, and what information about the project exists.



Space suits have many criteria for safety and functionality.

Science and Engineering Practices • Asking Questions and Defining Problems
10
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Find the Practices Handbook in your teacher resources.

Interactive Student Resources

Written to meet each Next Generation Science Standard (NGSS) performance expectation, **Applying Practices Worksheets** and **Project-Based Learning Activities** (PBLs) challenge your students to solve real problems in the real world. These sheets are editable, downloadable, accessible online, and designed to meet specific performance expectations.

Interactive student resources, learning activities, and worksheets are embedded for point-of-use access. Students can use these dynamic resources immediately to practice new concepts.

Students practice chemistry in action with these learning tools.

- **Project-Based Learning Activities** that integrate traditional science content with engineering content.
- Design-your-own labs.
- Guided Laboratory Investigations.
- Modeling activities.
- Research and communicate projects.

Find Applying Practice Worksheets in your teacher resources and teacher blades. Also accessible at point-of-use in student resources.



TIME SAVING TECHNOLOGY...

Creates interactive digital solutions

To meet you wherever you are on the digital spectrum, *Chemistry Matter and Change* interactive learning and teaching resources are easy-to-use, whether you're a technology novice, digital native, or somewhere in the middle.

- **ConnectED** is your digital teaching platform making it easy and convenient to customize lessons, review assignments, and communicate with students.
- **eSolutions** manual with always up-to-date answers and available 24-7 helps you identify knowledge gaps with premade or customized problem sets.

Effective Teaching and Learning

The new **ConnectED** digital platform for high school science brings a new level of engagement and effectiveness to your classroom.

A one-stop shop where you access Student eBooks, assessments tools, worksheets, presentations, messaging tools, and so much more!

The screenshot displays the 'CHEMISTRY' Teacher Center interface. At the top, there's a navigation bar with 'Home', 'Plan & Present', 'Manage & Assign', 'Assess', 'Resources', and 'PD'. Below this, a sidebar shows 'Chapter 18: Acids and Bases' and 'Section 1: Introduction to Acids and Bases'. The main content area features a large image of a coral reef with various fish. To the right, a sidebar shows the date 'Friday, May 23, 2014' and sections for 'Scheduled Lesson Plans', 'Assignments Due', 'Other Events', and 'Messages'. The footer includes the McGraw-Hill Education logo and links for 'TERMS OF USE', 'PRIVACY AND COOKIE NOTICE', 'TECHNICAL SUPPORT', 'MINIMUM REQUIREMENTS', and 'HELP'.

Plan, Teach, and Assess with *ConnectED*

- Plan and present personalized lessons with intuitive editing tools.
- Send and receive classroom assignments electronically to your students' **ConnectED** accounts.
- Create and customize premade diagnostic and summative evaluations using eAssessment.
- Access and review notes students take in their eBooks to plan class time and assignments more effectively.
- Search curriculum by keyword or standard.
- Offers tools such as My Files, Planner, Notebook, and eGlossary.
- Communicate with students using Message Center.

I Home | ConnectED | Help | Logout
CHEMISTRY
 STUDENT CENTER
 Home Homework Resources Collaborate
 Today is Thursday, July 17, 2014

DUE (0)
 [+] DUE LATER (0)
 HOMEWORK HISTORY (0)

Media
 Mrs. Stevenson
 Using Conversion Factors
 molar mass - mass of 1 mole

$$\frac{55.85 \text{ g Fe}}{1 \text{ mole Fe}} \text{ - or - } \frac{1 \text{ mole Fe}}{55.85 \text{ g Fe}}$$

Periodic Table of Elements

Expanded features such as Personal Tutors and Cyber Science™ go beyond the limitations of the printed page.

Apply Interactive Practice

Students have their own digital learning platform called **ConnectED Student Center**, complete with student worksheets and digital resources. Assignments you create appear in their to-do lists. Students can message you directly and submit their work.

With **ConnectED Student Center**, your students can access their class resources anytime, anywhere.

Use expanded Student Center features such as Personal Tutors and Cyber Science 3D™ videos to go beyond the limitations of the printed page and bring science into your student's lives like never before.

24-7 access

Use the **eSolutions Manual** to design a dynamic learning environment and effectively personalize content to meet each students' specific learning needs.

Replace your traditional manual with this digital **eSolutions Manual** to effectively create customized homework assignments and assign ready-made practice activities.

The **eSolutions Manual** can help you use class time more effectively. Use the “view online” feature in class and project questions and solutions on a screen or interactive whiteboard to make class time more interactive and productive.

Display questions one at a time, and reveal steps to help students work through problem sets individually or collaboratively.

The screenshot displays the eSolutions Manual interface. On the left, a sidebar lists chapters from 1 to 23 under the heading "Chemistry Matter and Change". The main area shows a "No Image Available" placeholder and options to "Include: Answers" and "Solutions". Below this, a "Select:" button is visible. On the right, a smaller window titled "Exercise 17" shows a practice problem. The problem asks to identify helium, krypton, and radon based on their atomic radii. It includes a diagram with three circles labeled A, B, and C. The solution states that the atomic radius increases when going down a group, so helium is the smallest and radon is the biggest.

Access your **eSolutions Manual** anytime and anywhere using **ConnectED** or **ConnectED Mobile**.

The **eSolutions Manual** features:

- All questions from the Student Edition.
- The flexibility to show answers, solutions, both, or neither.
- The ability to make customized worksheets from questions in the Student Edition, using evens, odds, or all problems.



EFFECTIVE RESULTS...

To support student success

Easy-to-use eAssessment and reporting tools equip you with the data you need to make informed instructional decisions and keep students engaged.

- **eAssessment** supports diverse types of evaluations and includes online scoring and report generation for digital and/or print distribution.
- **LearnSmart®** an interactive and adaptive learning system, effectively differentiates and supports struggling and advanced learners alike.
- **Professional Development** resources including pertinent information on new science standards and implementation best practices are available to you at point-of-use.

Turn Students into Star Performers

Turn your classroom into a chemistry success center with **eAssessment**. This robust resource gives you powerful tools to assess student progress and make data-driven instructional decisions.

The **eAssessment** reporting feature means you'll always have access to valuable data on individual students and whole classes to help you differentiate and support student mastery of concepts appropriately.

Other features of eAssessment to help increase your efficiency:

- Question Bank with questions organized by strand, subject, and lesson.
- Assessment creation or customization of premade assessments.
- Report generation on proficiency and accuracy.

Identify students with knowledge gaps to make data-driven instructional decisions with eAssessment.

The screenshot displays the McGraw-Hill eAssessment interface. On the left, a sidebar shows a tree view of 'Question Sets' and 'Tests'. The main area shows 'Chapter 1 Set (Student Edition) (English)' with a 'True / False' section. Below this, an 'Assignment Results' pop-up window is visible, showing student performance data.

Assignment Results
Date: June 11, 2014
Assignment: Practice Homework
Student: Sample Student
Class: 2nd Period
School: SAMPLE SCHOOL
Term:
Score: 13 / 87

Question #	Question Type	Points	Response
X 1	True / False	0 / 1	T
X 2	True / False	0 / 1	F
3	True / False	1 / 1	T
4	True / False	1 / 1	T
X 5	True / False	0 / 1	T
6	True / False	1 / 1	F
7	True / False	1 / 1	T
8	True / False	1 / 1	F
9	True / False	1 / 1	F
X 10	True / False	0 / 1	F
11	True / False	1 / 1	T
12	True / False	1 / 1	F
X 13	True / False	0 / 1	T
14	True / False	1 / 1	T

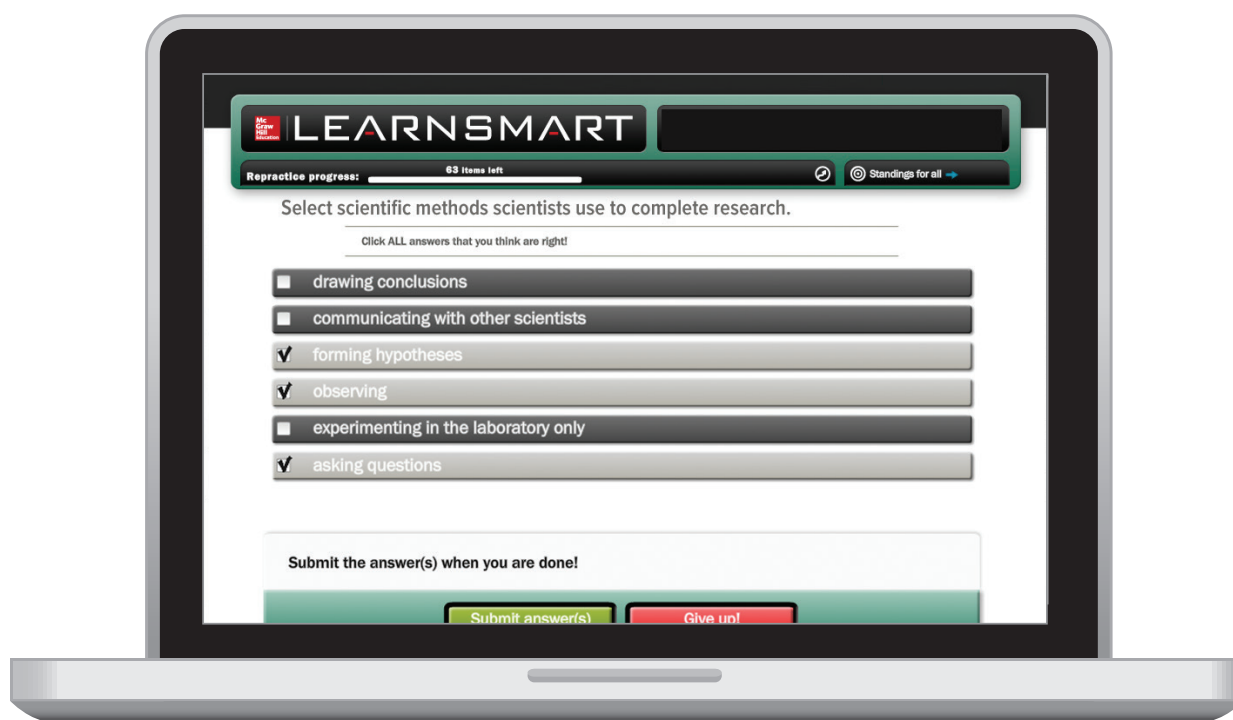
eAssessment suite collects valuable data for every student and the class.

Increase Knowledge Retention

Increase retention of material, improve students' performance, and make your class more interactive and productive with proven adaptive learning system, *LearnSmart*®.

As an interactive and adaptive learning system, *LearnSmart*® is designed to help students learn faster, study more efficiently, and retain more knowledge for greater success. Both dynamic and progressive, *LearnSmart*® adjusts chemistry concepts to align with each student's progress, based on their demonstrated skill and performance.

No two students learn the same way. *LearnSmart*® personalizes content for each student's unique learning needs.



Pinpoint knowledge gaps for individual students and across classes.

Empower students to personalize their learning experience with optimal learning paths so they spend more time on what they don't know with *LearnSmart*®.

- Practice of basic chemistry concepts to improve recall and application before moving on.
- Additional exposure and increased practice to master new concepts.
- Presentation of concepts individual students struggle to master.

Transform Your Classroom

In just a few clicks, you can quickly access relevant, timely, and ongoing **Professional Development** videos and webinars available to you, on-demand.

Directly embedded in *Chemistry Matter and Change* is your interactive professional learning program. Learn how other science educators have successfully implemented the program and increase your awareness of new science standards.

Relevant Resources for science educators.

Rich, web-based resources include modeled classroom instruction videos, implementation support, technology resource optimization, and professional learning community support.

Use the ConnectED, Professional Development tab to access on-demand webinars and these free video libraries:

- Dinah Zike/Foldable Videos
- Mathematical Practice Videos
- Pedagogical/Instructional Support Videos
- Digital Instruction Videos
- STEM Videos

Customized,
comprehensive, and
expertly-crafted
solutions translate into
meaningful program
success.

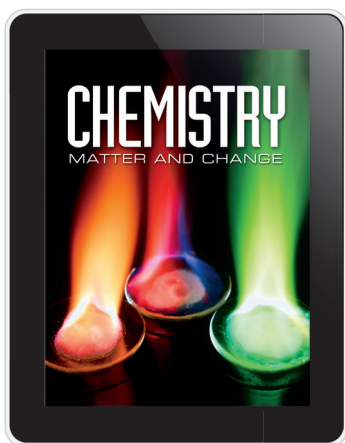
The screenshot displays the 'CHEMISTRY' Teacher Center website. The top navigation bar includes links for Home, ConnectED, Help, and Logout. Below this, a search bar and a 'Standards' button are visible. The main navigation menu features tabs for Home, Plan & Present, Manage & Assign, Assess, Resources, and PD (which is circled in blue). To the left of the main content area, there is a sidebar with categories: Implementation Support, Dinah Zike/Foldable Videos, Digital Instruction Videos (highlighted in green), and On-Demand Webinars. The main content area shows a grid of video thumbnails titled 'Transform Your Classroom with Technology' for Grades 6-8. A large video player window is open, showing a teacher standing in front of a green chalkboard, addressing a class of students.

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Sample and Discover Online
mheonline.com/onlinesamples/science