

Glencoe
**Earth
Science**

**Geology, the Environment,
and the Universe**

Transform Your Classroom!

Transform Your Classroom!

Glencoe Earth Science: 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.

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

Glencoe Earth Science brings forces alive that shape the world and engages students with relevant text, dynamic visuals, and intriguing labs written by active classroom teachers. *Glencoe Earth Science* combines dynamic content, engaging lab experiences, and a rich array of resources.

Whether you're looking for a hybrid digital-print or a digital-first program, *Glencoe Earth Science* gives you proven, comprehensive content with real-world applications to help your students lead the way in earth science!


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**

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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 a backpack is the central focus, looking upwards with a hopeful expression. She is wearing a purple and pink plaid shirt and black pants. In the background, another person with a backpack is visible, and the setting is a lush, green forest with tall trees.

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 earth science 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 earth science 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 earth science-in-action! The *Student eBook* helps students turn earth science 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 earth science 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.

Table 10.1 World's Water Supply

Location	Percentage of Total water	Water Volume (km ³)	Estimated Average Residence Time of Water
	97.2	1,230,000,000	thousands of years
	2.15	28,600,000	tens of thousands of years
	0.31	4,000,000	thousands of years
	0.009	1,000,000	hundreds of years
	0.001	100,000	decades
	0.0001	10,000	years

Groundwater

Atmosphere

Oceans

Rivers and streams

Drag each option to its corresponding Location ➡

Earth's Systems

Scientists who study Earth have identified four main Earth systems: the geosphere, atmosphere, hydrosphere, and biosphere. Each system is unique, yet each interacts with the others.

Geosphere The area from the surface of Earth down to its center is called the **geosphere**. The geosphere is divided into three main parts: the crust, mantle, and core. These three parts are illustrated in **Figure 3**.


The rigid outer shell of Earth is called the crust. There are two kinds of crust—continental crust and oceanic crust. Just below the crust is Earth's mantle. The mantle differs from the crust both in composition and behavior. The mantle ranges in temperature from 100°C to 4000°C—much warmer than the temperatures found in Earth's crust. Below the mantle is Earth's core. Temperatures in the core may be as high as 7000°C.

Atmosphere The blanket of gases that surrounds our planet is called the **atmosphere**. Earth's atmosphere contains about 78 percent nitrogen and 21 percent oxygen. The remaining 1 percent of gases in the atmosphere include water vapor, argon, carbon dioxide, and other trace gases. Earth's atmosphere provides oxygen for living things, protects Earth's inhabitants from harmful radiation from the Sun, and helps to keep the planet at a temperature suitable for life.

Hydrosphere All the water on Earth, including the water in the atmosphere, makes up the **hydrosphere**. About 97 percent of Earth's water exists as salt water, while the remaining 3 percent is freshwater contained in lakes and rivers, beneath Earth's surface as groundwater, and in glaciers. The region of permanently frozen water on Earth is called the **cryosphere**. Only a fraction of Earth's total amount of freshwater is in lakes and rivers.

VOCABULARY
SCIENCE USAGE v. COMMON USAGE
Crust
 Science usage: the thin, rocky, outer layer of Earth.
 Common usage: the hardened exterior or surface part of bread.

Figure 3 Earth's geosphere is composed of everything from the crust to the center of Earth. Notice how thin the crust is in relation to the rest of the geosphere's components.



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

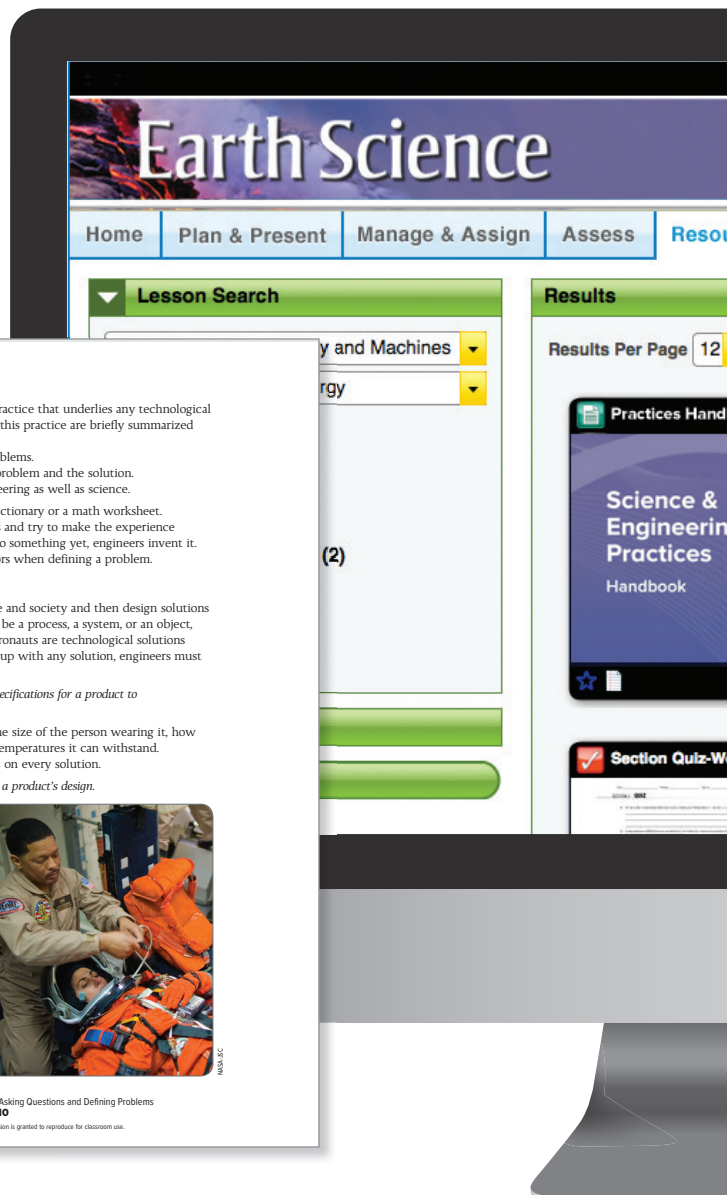
Real-world Connections

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.



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 earth science 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.

The image shows a digital interface for a 'TEACHER CENTER'. At the top, there are navigation links: 'Home | ConnectED | Help | Logout'. Below this is a search bar with a magnifying glass icon and a 'Standards' button. A navigation bar contains icons for 'PD', a user profile, a book, a folder, a calendar, a pencil, and a circular logo with 'ABC'. Below the navigation bar, there are several thumbnails of educational resources. One prominent thumbnail is titled 'Applying Practices W...' and shows a worksheet titled 'The Sun's Energy Formation and Radiation'. Another thumbnail is titled 'PhysicsLAB-Stair Cil...'. In the foreground, a larger view of the worksheet is shown. The worksheet has a header with 'Name _____ Date _____ Class _____' and a logo for 'APPLYING PRACTICES'. The main title is 'The Sun's Energy Formation and Radiation'. The text on the worksheet reads: 'The Sun emits an immense amount of energy—first generated in its core, then radiated outward to its surface and then outwards into the solar system. However, the energy that is generated in the core of the Sun is not the same amount of energy that reaches the surface of Earth. For this activity, you will develop a model based on published evidence. Your model should illustrate the life span of the Sun and the role of nuclear fusion in the Sun's core to release energy that eventually reaches Earth in the form of radiation. This worksheet will help you plan, develop, and execute your model.' Below this is a section titled 'Develop Your Model' with four numbered tasks: 1. 'In your own words, describe what process or question your model will illustrate.' followed by two blank lines. 2. 'What type of model will you use? What materials will you need to develop your model? Do not forget that you will need published evidence to support your model.' followed by three blank lines. 3. 'Use the space below to sketch a prototype of your model. If you need more space, you can use a separate page.' followed by three blank lines. 4. 'Complete your model. Below, explain how it works and describe how it addresses the process or question.' followed by three blank lines. At the bottom of the worksheet, it says 'Applying Practices • The Sun's Energy Formation and Radiation' and 'Copyright © McGraw-Hill Education. Permission is granted to reproduce for classroom use.'

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

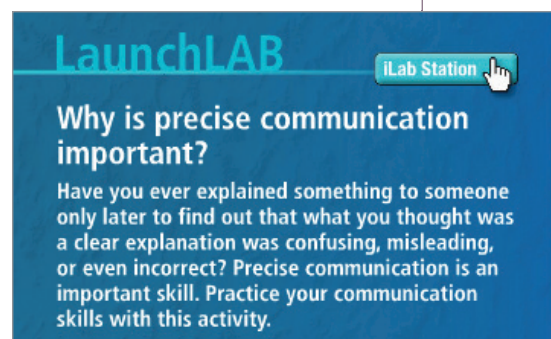
Science in Action

Glencoe Earth Science offers you diverse lab opportunities to deepen your students' understanding of science by experiencing it and experimenting with earth science first-hand!

Use these lab activities included in every chapter to bring science to life for your students.

- Launch Labs*
- MiniLabs*
- Problem Solving Labs*
- GeoLabs*
- Lab Manual

*available in the student edition



LaunchLAB iLab Station

Why is precise communication important?

Have you ever explained something to someone only later to find out that what you thought was a clear explanation was confusing, misleading, or even incorrect? Precise communication is an important skill. Practice your communication skills with this activity.

Launch Lab is found on the Chapter opener

[Chapter 1]

LaunchLAB

Why is precise communication important?

Have you ever explained something to someone only later to find out that what you thought was a clear explanation was confusing, misleading, or even incorrect? Precise communication is an important skill.

Procedure [Eye Safety, Clothing Protection, Handwashing]

1. Read and complete the lab safety form.
2. Obtain an **object** from your teacher. Do not show it to your partner.
3. Write one sentence that accurately describes the object in detail without identifying or naming the object.
4. Give your partner the description and allow him or her a few minutes to identify your object.

Now use your partner's description to identify his or her object.

Analysis

Identify Were you and your partner able to identify each others' objects? Why or why not?

Error Analysis Work together to rewrite each description in your science journals to make them as accurate as possible.

Compare Trade the new descriptions with another pair of students. Did this pair of students have an easier time determining the objects than you and your partner did? Why or why not?



TIME SAVING TECHNOLOGY...

Creates interactive digital solutions

To meet you wherever you are on the digital spectrum, *Glencoe Earth Science* 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.

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 shows the 'Earth Science' Teacher Center interface. At the top, there is a navigation bar with 'Home | ConnectED | Help | Logout' and a search bar labeled 'Standards'. Below this is a 'TEACHER CENTER' header with a search bar and a 'Standards' button. The main navigation menu includes 'Home', 'Plan & Present', 'Manage & Assign', 'Assess', 'Resources', and 'PD'. A secondary menu shows 'Chapter 10: Groundwater' and 'Section 1: Movement and Storage of Groundwater' with an 'Open eBook' button. A central toolbar contains icons for 'abc', a play button, a checkmark, and a document. The main content area features a large image of a geyser erupting, with a person standing nearby for scale. To the right of the image is a sidebar with a date selector for 'Wednesday, May 28, 2014' and a period selector for '1st Period (0)'. Below these are sections for 'Scheduled Lesson Plans', 'Assignments Due', and 'Other Events', all indicating no items are scheduled. A 'Messages' section shows 'You have no messages at this time.' and a 'Shared Updates (0)' button. The footer includes the McGraw-Hill Education logo, copyright information, 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.

| Home | ConnectED | Help | Logout
Earth Science Standards
STUDENT CENTER
 Home Homework Resources Collaborate
 Today is Thursday, July 17, 2014

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

Media ✕

Island erodes as fringing coral reefs form.

Hot spot
Mantle plume

Mc Graw Hill Education

Expanded features such as Animations 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 Animations 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.



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 earth science success center with **eAssessment** suite – a robust resource – giving 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.

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

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.

The screenshot displays the McGraw-Hill eAssessment interface. On the left, there are navigation panels for 'Question Sets' and 'Tests'. The main area shows a 'Chapter 1 Set (Student Edition) (English)' with several multiple-choice questions. An 'Assignment Results' window is overlaid on the right, showing student performance data for a 'Practice Homework' assignment.

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

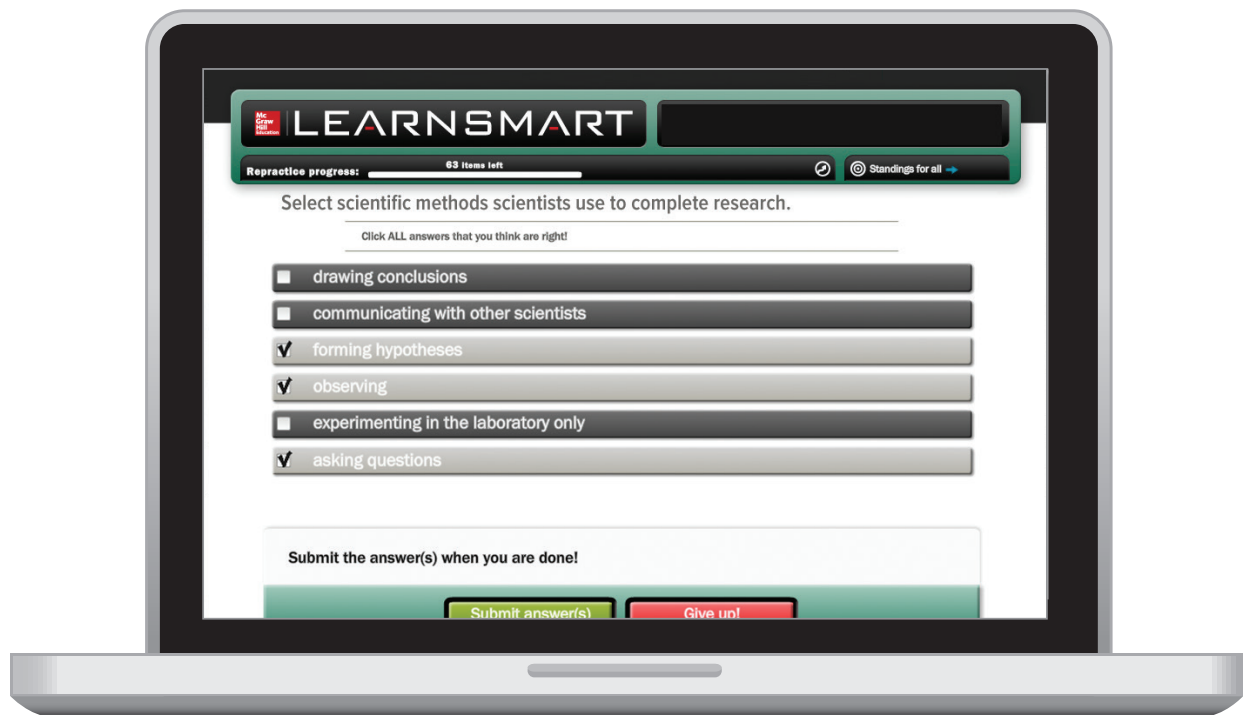
eAssessment suite collects valuable data for every student and the class.

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 earth science 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 earth science 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 *Glencoe Earth Science* 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.

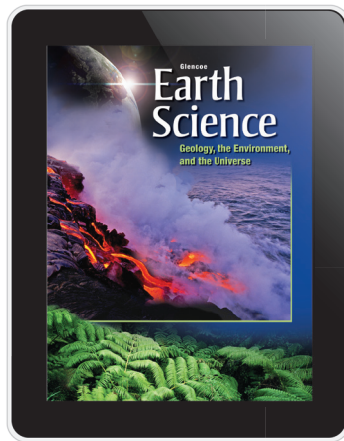
The screenshot displays the 'Earth Science' Teacher Center interface. At the top, there is a navigation bar with 'Home', 'Plan & Present', 'Manage & Assign', 'Assess', 'Resources', and 'PD' (circled in blue). A search bar and 'Standards' link are also visible. The main content area shows a grid of video thumbnails titled 'Transform Your Classroom with Technology Grades 6-8'. A 'Media' window is open, showing a video of a teacher in a classroom. The left sidebar lists 'Implementation Support', 'Dinah Zike/Foldable Videos', 'Digital Instruction Videos' (highlighted in green), and 'On-Demand Webinars'.

Glencoe

Earth Science

Geology, the Environment,
and the Universe

Transform Your Classroom!



Sample and Discover Online
mheonline.com/onlinesamples/science