

GLENCOE

PHYSICAL SCIENCE

Transform Your Classroom!

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Glencoe Physical 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 physical science curriculum that meets both Next Generation Science Standards (NGSS) and local science standards.

Glencoe Physical Science comes alive with engaging, relevant, explorations geared toward building an in-depth understanding of the Big Ideas of the physical world. *Glencoe Physical 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 Physical Science* gives you proven, comprehensive content with real-world applications to help your students lead the way in physical 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 and to the right. 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 physical 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 physical 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 physical science-in-action! The **Student eBook** helps students turn physical 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 physical 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	4,0	
	0.009	1	
	0.001		
	0.0001		

Groundwater

Atmosphere

Oceans

Rivers and streams

Drag each option to its corresponding Location ➔

Figure 11 The amplitude of a transverse wave is half the vertical distance between the crests and the troughs.
Describe how you could create waves with different amplitudes in a piece of rope.

Amplitude of transverse waves If you have ever been knocked over by an ocean wave, you know that the higher the wave, the greater the disturbance from that wave. Remember that the amplitude of a wave increases as the disturbance from that wave increases. So, a tall ocean wave has a greater amplitude than a short ocean wave does.
The amplitude of any transverse wave is the vertical distance from the crest or trough of the wave to the rest position of the medium, as shown in **Figure 11**. Tall waves have large amplitude, and short waves have small amplitude. The amplitude of any transverse wave is also half the vertical distance from crest to trough.

REVIEW IT! Wave Properties

Section Summary

- Wavelength is the distance between a point on a wave and the nearest point just like it.
- Wave frequency is the number of wavelengths passing a fixed point each second.
- Wave period is the amount of time it takes one wavelength to pass a fixed point.

11. MAIN IDEA Identify a wave that speeds up when it passes from air to water as well as one that slows down.

12. Describe the difference between a longitudinal wave with a large amplitude and one with a small amplitude.

13. Describe how the wavelength of a wave changes if the wave slows down but its frequency does not change.

14. Explain how the frequency of a wave changes when the period of the wave increases.

15. Think Critically You make a transverse wave by shaking the end of a...

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

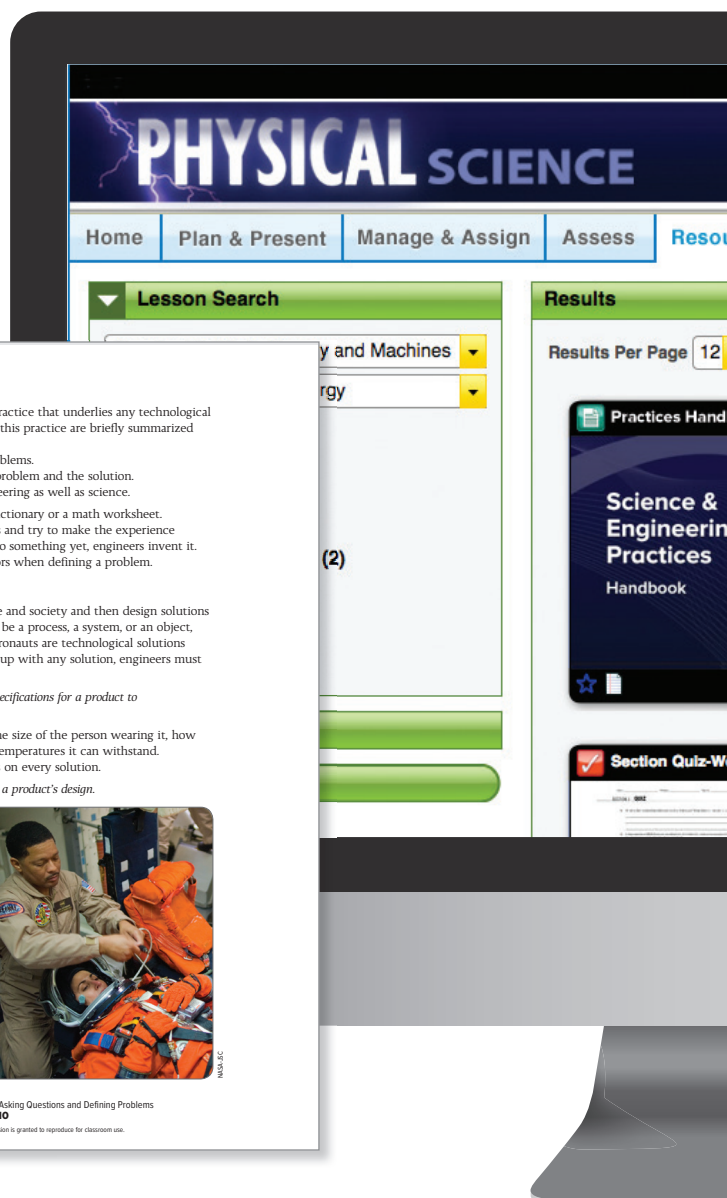
Real-world Connections

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.

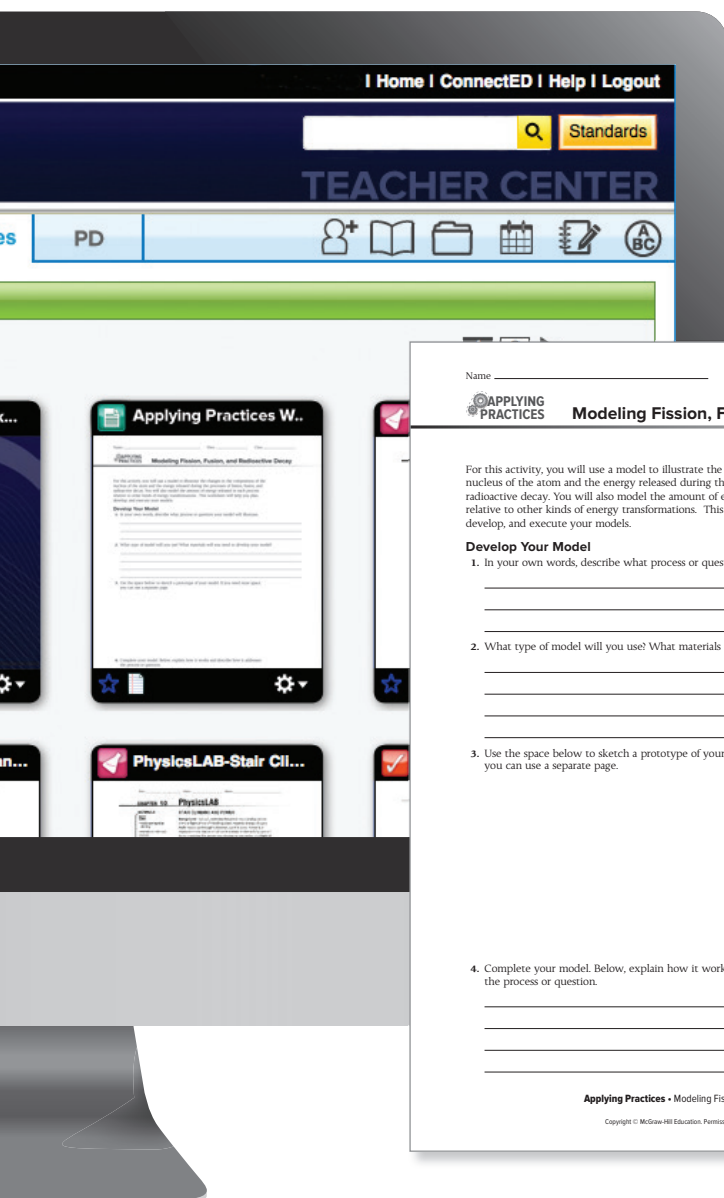
Interactive Student Resources

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 physical 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.



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

Science in Action

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

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

- Launch Labs*
- MiniLabs*
- Physical Science Labs*
- Design Your Own Labs*
- Lab Manual
- Virtual Labs
- Video Labs
- Probeware Labs

*available in the student edition

Name _____ Date _____ Class _____

Launch Lab

Technology in Your Life

Procedure
Read the procedure and safety information, and complete a lab form.

1. Make a list of everything that you do from the time that you get home from school until you go to bed.
2. Circle the items on the list that involve some type of technology.
3. Select two of the items and identify the technologies involved in the item.
For example, the technologies involved in a television may be the wiring and the wave that transports the signal.

Think Critically

4. What are two forms of technology that you use on a regular basis that you could live without?

Launch Lab

Technology in Your Life

For nearly 10,000 years, farmers have used technology to help them optimize crop production. Today, they use things like GPS systems to guide their tractors. Technology is the application of science to help people. How much technology do you use?

For a lab worksheet, use your StudentWorks™ Plus Online.

?
Inquiry
Launch Lab

Launch Lab is found on the Chapter opener

x

Virtual Labs

Organic Compounds

What are the energy outputs of different types of fuel?

Procedure:

1. Click and drag one of the fuels into the fuel hopper. Ten kilograms of that fuel will be burned. Record the fuel and its mass (10 kg) in the table.
2. Click the Burn button. The burning fuel will create heat to produce steam. The steam will cause the turbine to spin. Record in the Table the mass of water converted to steam. This mass is displayed in the box near the turbine.
3. When the turbine spins, electricity is generated in kilowatt hours (kWh). The reading on the kilowatt meter shows the number of kWh of electricity generated by burning 10 kg of fuel. Record this value in the Table.
4. Watch the building light up. The fuel that generates the most kWh of

Journal
Calculator
Table
Audio
Print



TIME SAVING TECHNOLOGY...

Creates interactive digital solutions

To meet you wherever you are on the digital spectrum, *Glencoe Physical 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 displays the 'PHYSICAL SCIENCE TEACHER CENTER' interface. At the top, there are navigation links for 'Home', 'Plan & Present', 'Manage & Assign', 'Assess', 'Resources', and 'PD'. A search bar and 'Standards' link are also present. Below the navigation, there are dropdown menus for 'Chapter 4: Work and Energy' and 'Section 1: Work and Machines', along with an 'Open eBook' button. A row of icons includes 'abc', a play button, a checkmark, and a document icon. The main content area features a large image of wind turbines in a field with mountains in the background. 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. At the bottom of the sidebar is a 'Messages' section with 'Shared Updates (0)' and a message stating 'You have no messages at this time.' 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.

The screenshot displays the ConnectED Student Center interface for Physical Science. At the top, there is a navigation bar with 'Home', 'Homework', 'Resources', and 'Collaborate' buttons. A search bar and 'Standards' link are also present. The main content area shows a 'DUE (0)' section with a '+] DUE LATER (0)' link and a 'HOMEWORK HISTORY (0)' section. A 'Media' window is open, displaying a 3D animation of a motor and a video player showing a ball falling through a grid. The video player has a caption: 'ical motion is like that of an object dropped'. The McGraw Hill Education logo is visible in the bottom left corner.

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 physical 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 3 Set (Student Edition) (English)' with a list of 10 questions. The first question is highlighted: '1. An object in motion at a constant velocity will change its motion only if a balanced force acts on it. ANSWER: False - an unbalanced'. An 'Assignment Results' pop-up window is overlaid on the right, showing details for a 'Practice Homework' assignment for 'Sample Student' in '2nd Period' at 'SAMPLE SCHOOL'. The report shows a score of 13/87 and a table of results for 14 questions.

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

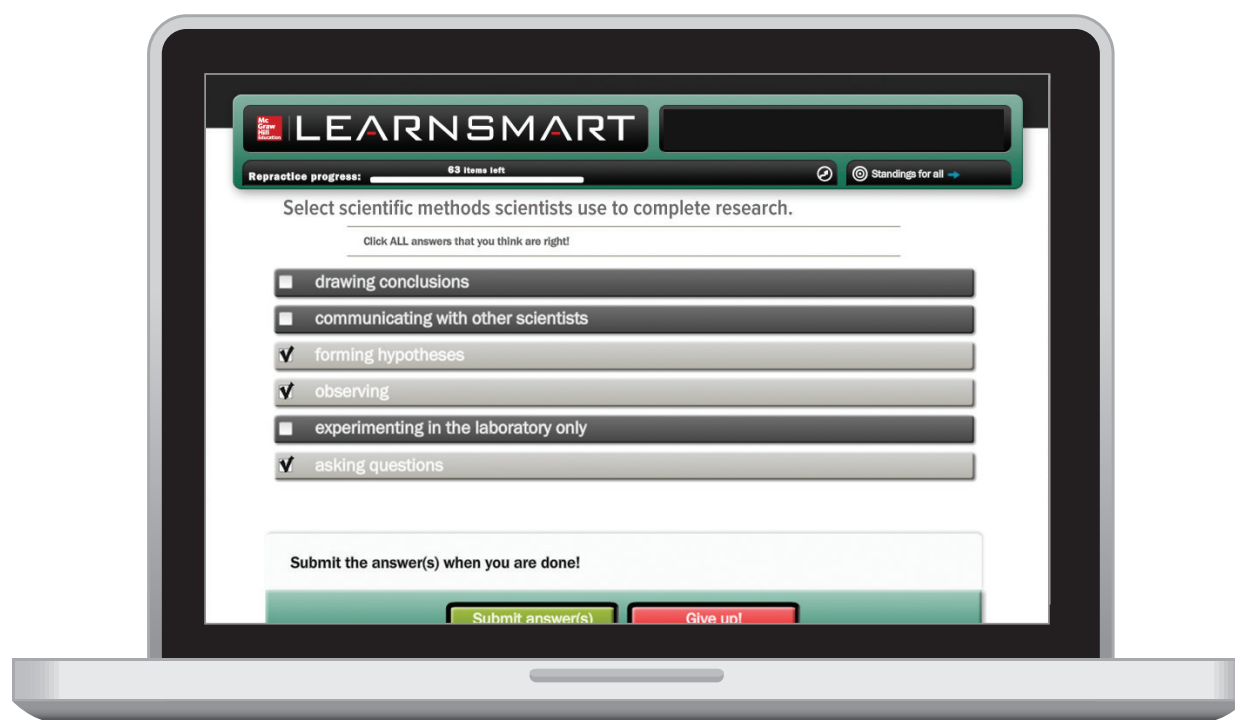
eAssessment suite collects valuable data for every student and the class.

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 physical 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 physical 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 Physical 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:

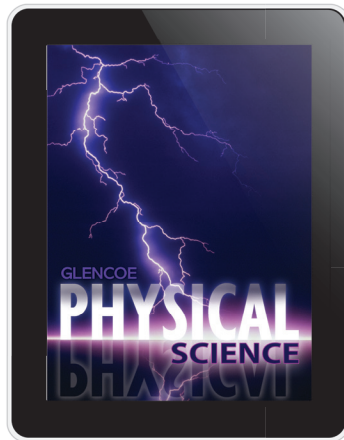
- Dinah Zike/Foldable Videos
- Mathematical Practice Videos
- Pedagogical/Instructional Support Videos
- Digital Instruction Videos
- STEM Videos

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

The screenshot displays the 'PHYSICAL SCIENCE TEACHER CENTER' website. The top navigation bar includes 'Home', 'Plan & Present', 'Manage & Assign', 'Assess', 'Resources', and 'PD' (which is circled in blue). A search bar with a 'Standards' button is also visible. The left sidebar lists 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, with one video titled 'Transform Your Classroom with Technology Grades 6-8' by Traciweh Differentiated being open in a 'Media' window. The video shows a teacher standing at a chalkboard in a classroom, addressing a group of students.

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**PHYSICAL
SCIENCE**

Transform Your Classroom!



Sample and Discover Online

mheonline.com/onlinesamples/science