Houghton Mifflin Harcourt

HMH SCIENCE DIMENSIONS™

ENGINEERED *for the* NEXT GENERATION

Program Overview

GRADES 6–8

Built from the ground up for

NEXT GENERATION SCIENCE STANDARDS

EXPLORE.
EXPERIMENT.
EXPERIENCE.

Envision a classroom where students ask questions, state claims, test their ideas, and find resolution through reasoning. With increased demand for science literacy in the workplace, it has become imperative to develop such innovators and problem solvers to fill critical, next generation career roles.

This instructional shift is achievable now.
With built-in support and a transformed lesson structure, instructors will become facilitators who empower their students to learn through self-directed exploration, analysis, application, and explanation—in short, to think like scientists.

HMH SCIENCE DIMENSIONS™

A **NEW** K–12 solution engineered
for success with NGSS

Inspire the next generation of scientists and innovators

- Promote active learning with **investigation-driven activities.**
- Build excitement for **engineering and STEM.**
- Build problem-solving skills with **performance-based assessment.**
- Engage students with motivating **digital resources**, including connections to Google® Expeditions.
- Create **enduring understanding** with integrated Three-Dimensional Learning.
- Develop effective NGSS* approaches with embedded **professional support from HMH.**

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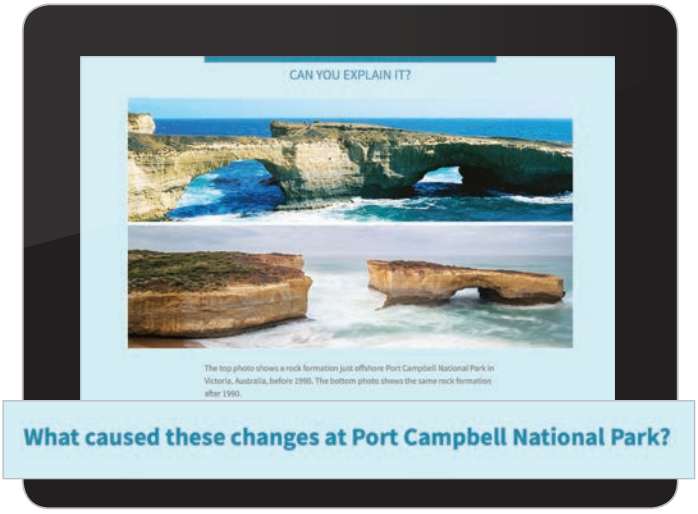
Build Student Confidence with Authentic Investigations

Students are more engaged and learn more meaningfully through investigative inquiry. ***HMH Science Dimensions*** is built on this approach. Your students will learn to conduct hands-on investigations, define questions and objectives, make claims, and identify evidence—in short, to **take charge** and **fully engage** in their learning!



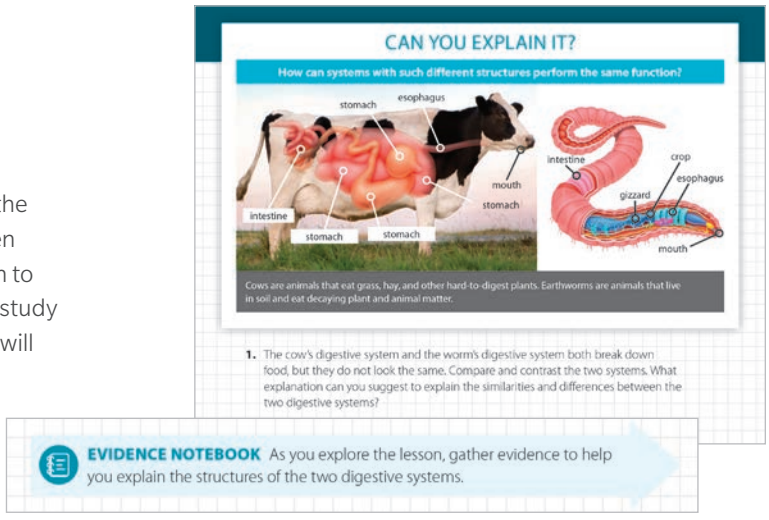
Earth and Space Sciences Module F Online Student Edition

Discrepant Phenomena Lead Every Lesson

- Each lesson begins with **Can You Explain It?**—a **problem to solve** or **discrepant event to explain**. This lesson-leading feature provides intrinsic motivation to spark curiosity and serves as the context for the three-dimensional learning and hands-on activities throughout the lessons. Students are motivated to think critically and construct explanations of *how* and *why*.
- The program is built around **active learning**. Rather than receive content passively, students are asked to **solve problems** or explain phenomena, by stating **claims**, gathering **evidence**, and providing explanations through **reasoning**.

Science Notebooking to Strengthen Writing Skills

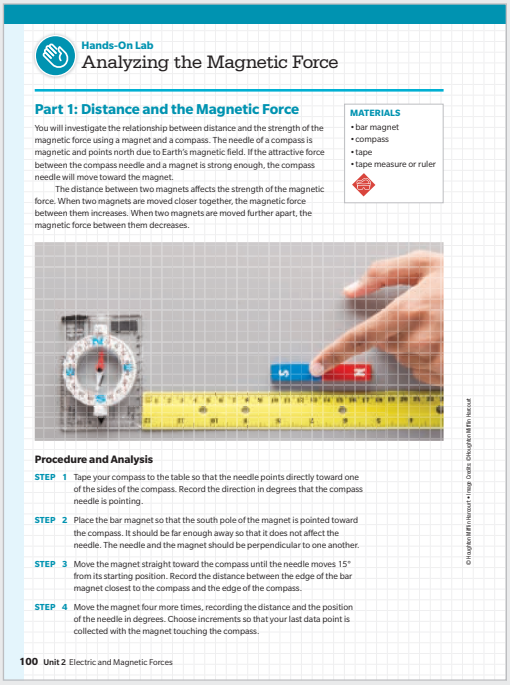
Many of the lessons in ***HMH Science Dimensions*** support the use of **Evidence Notebooks**. **Helpful prompts** have been inserted throughout the lessons to guide students on when to use these notebooks. Students will love creating their own study guides that can be taken into the next grade, and teachers will love the extra writing practice!



Life Science Module B Print Student Edition

Drive Student Learning with Hands-On Labs

- **Hands-On Labs** are integrated into many of the lessons. These are built with teachers' busy schedules in mind. Each lab uses **easily sourced materials**.
- Many activities, including the **Hands-On Labs**, contribute to a student's evidence gathering in each lesson.
- Students get to actively "do science"; they **think critically** about their observations, practice gathering evidence, and defend their claims.



Hands-On Lab
Analyzing the Magnetic Force

Part 1: Distance and the Magnetic Force

You will investigate the relationship between distance and the strength of the magnetic force using a magnet and a compass. The needle of a compass is magnetic and points north due to Earth's magnetic field. If the attractive force between the compass needle and a magnet is strong enough, the compass needle will move toward the magnet.

The distance between two magnets affects the strength of the magnetic force. When two magnets are moved closer together, the magnetic force between them increases. When two magnets are moved further apart, the magnetic force between them decreases.

MATERIALS
- bar magnet
- compass
- tape
- tape measure or ruler

Procedure and Analysis

STEP 1 Tape your compass to the table so that the needle points directly toward one of the sides of the compass. Record the direction in degrees that the compass needle is pointing.

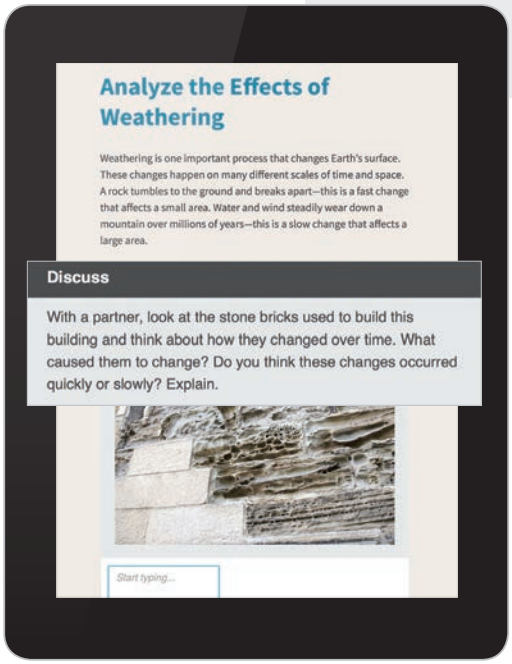
STEP 2 Place the bar magnet so that the south pole of the magnet is pointed toward the compass. It should be far enough away so that it does not affect the needle. The needle and the magnet should be perpendicular to one another.

STEP 3 Move the magnet straight toward the compass until the needle moves 15° from its starting position. Record the distance between the edge of the bar magnet closest to the compass and the edge of the compass.

STEP 4 Move the magnet four more times, recording the distance and the position of the needle in degrees. Choose increments so that your last data point is collected with the magnet touching the compass.

100 Unit 2 Electric and Magnetic Forces

Physical Science Module K
Print Student Edition



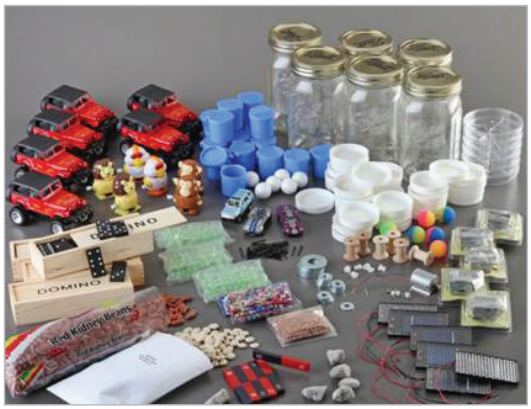
Earth and Space Sciences Module F
Online Student Edition

Cultivate Collaboration

Working as a team is an essential part of developing **21st-century skills**. ***HMH Science Dimensions*** provides ample opportunities for students to participate in groups to complete activities and partner with their peers to discuss their findings.

Save Prep Time with Equipment Kits

- **Equipment Kits** provide the **consumable** and **non-consumable** materials you need to complete most of the hands-on activities so you have all the materials you need right at your fingertips.
- The **Safety Kit** provides the materials you need to address **classroom safety** while performing the program activities.

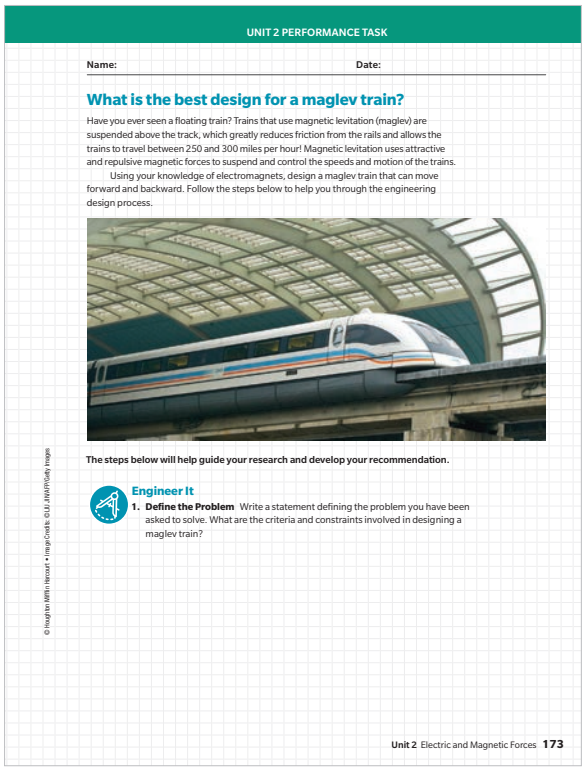


Today's Students Will Solve the Technology Challenges of Tomorrow!

NGSS* has raised the engineering design process to the same level as scientific inquiry. In ***HMH Science Dimensions***, science, technology, engineering, and math are considered an **integral** part of the curriculum. Lessons are designed for students to explore science the same way real-life scientists do. Watch your students' eyes **light up** as they brainstorm solutions, share their ideas, and experiment to find solutions.

Elevate Engineering

In ***HMH Science Dimensions,*** engineering and STEM are carried throughout every unit and not just treated as an ancillary. This approach elevates engineering design to the same level as scientific literacy. Each Unit includes a **Performance Task**, offering students multiple opportunities throughout the program to apply the **engineering design process** by defining a problem and designing a solution.



UNIT 2 PERFORMANCE TASK

Name: Date:

What is the best design for a maglev train?

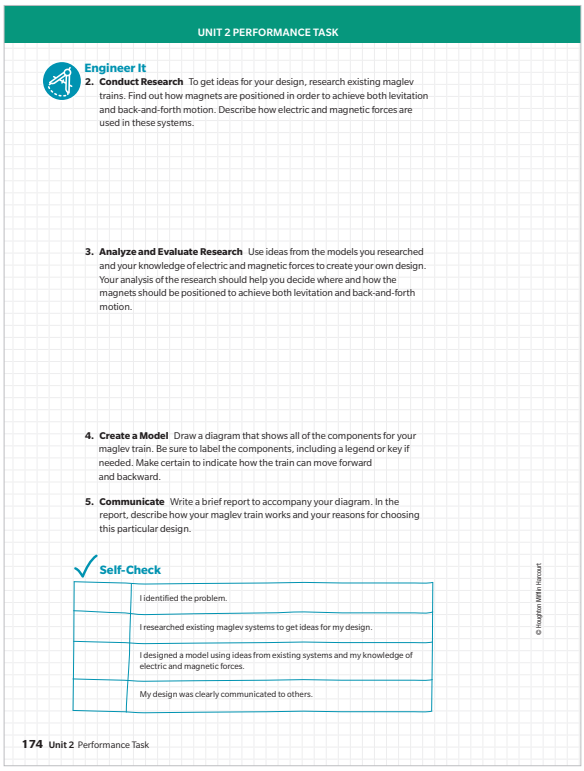
Have you ever seen a floating train? Trains that use magnetic levitation (maglev) are suspended above the track, which greatly reduces friction from the rails and allows the trains to travel between 250 and 300 miles per hour! Magnetic levitation uses attractive and repulsive magnetic forces to suspend and control the speeds and motion of the trains.

Using your knowledge of electromagnets, design a maglev train that can move forward and backward. Follow the steps below to help you through the engineering design process.

The steps below will help guide your research and develop your recommendation.

Engineer It

1. **Define the Problem** Write a statement defining the problem you have been asked to solve. What are the criteria and constraints involved in designing a maglev train?



UNIT 2 PERFORMANCE TASK

Engineer It

2. **Conduct Research** To get ideas for your design, research existing maglev trains. Find out how magnets are positioned in order to achieve both levitation and back-and-forth motion. Describe how electric and magnetic forces are used in these systems.

3. **Analyze and Evaluate Research** Use ideas from the models you researched and your knowledge of electric and magnetic forces to create your own design. Your analysis of the research should help you decide where and how the magnets should be positioned to achieve both levitation and back-and-forth motion.

4. **Create a Model** Draw a diagram that shows all of the components for your maglev train. Be sure to label the components, including a legend or key if needed. Make certain to indicate how the train can move forward and backward.

5. **Communicate** Write a brief report to accompany your diagram. In the report, describe how your maglev train works and your reasons for choosing this particular design.

Self-Check

	I identified the problem.
	I researched existing maglev systems to get ideas for my design.
	I designed a model using ideas from existing systems and my knowledge of electric and magnetic forces.
	My design was clearly communicated to others.

Physical Science
Module K Print
Student Edition

Education Leaders You Can Trust

During consulting author **Cary Sneider's** teaching career and nearly three decades at the Lawrence Hall of Science in Berkeley, California, he developed skills in curriculum development and teacher education. He was a **writing team leader** for the Next Generation Science Standards and has been instrumental in ensuring ***HMH Science Dimensions*** meets the high expectations of the NGSS and provides an effective three-dimensional learning experience for all students.

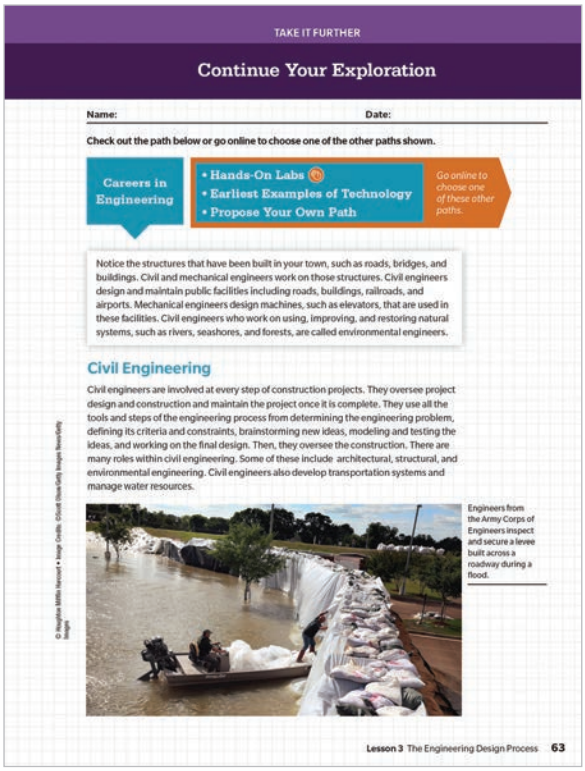
Dr. Cary Sneider

Michael DiSpezio has authored many HMH instructional programs for Science and Mathematics. Most recently, he has been working with educators to provide strategies for implementing the **Next Generation Science Standards**, particularly the science and engineering practices, crosscutting concepts, and the use of evidence notebooks. To all his projects, he brings his extensive background in science; his expertise in classroom teaching at the elementary, middle, and high school levels; and his deep experience in producing interactive and engaging instructional materials.

Michael DiSpezio

Inspire Students to Consider STEM Careers

The Take it Further (Elaborate) section of each unit features **People and Careers in Science & Engineering**. These features show students the **real-world applications** of what they're learning and pique their interest in science-based careers.



TAKE IT FURTHER

Continue Your Exploration

Name: Date:

Check out the path below or go online to choose one of the other paths shown.

Careers in Engineering

- Hands-On Labs
- Earliest Examples of Technology
- Propose Your Own Path

Go online to choose one of these other paths.

Notice the structures that have been built in your town, such as roads, bridges, and buildings. Civil and mechanical engineers work on those structures. Civil engineers design and maintain public facilities including roads, buildings, railroads, and airports. Mechanical engineers design machines, such as elevators, that are used in these facilities. Civil engineers who work on using, improving, and restoring natural systems, such as rivers, seashores, and forests, are called environmental engineers.

Civil Engineering

Civil engineers are involved at every step of construction projects. They oversee project design and construction and maintain the project once it is complete. They use all the tools and steps of the engineering process from determining the engineering problem, defining its criteria and constraints, brainstorming new ideas, modeling and testing the ideas, and working on the final design. Then, they oversee the construction. There are many roles within civil engineering. Some of these include architectural, structural, and environmental engineering. Civil engineers also develop transportation systems and manage water resources.

Engineers from the Army Corps of Engineers inspect and secure a levee built across a roadway during a flood.

Lesson 3 The Engineering Design Process 63

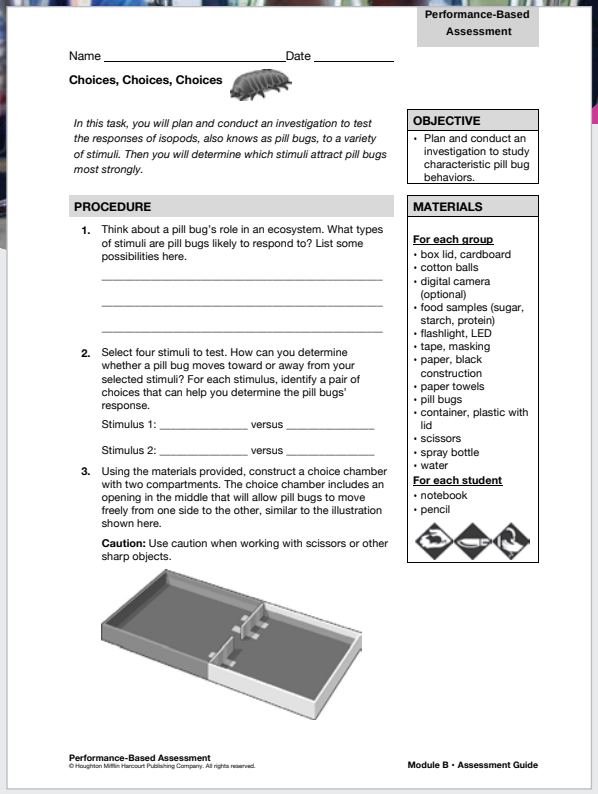
Engineering Module A Print Student Edition

Provide Extra Support for Students Who Need It

The **Science and Engineering Practices Online Handbook** will help students achieve a higher level of understanding and skill as they build their experience applying the **Science and Engineering Practices** of NGSS.

Let Students Show What They Know

For the first time ever, through NGSS,* science standards now include specific **measurable learning outcomes**. These Performance Expectations guide test developers and teachers in understanding how to measure student learning. ***HMH Science Dimensions*** offers flexible assessment tools in a variety of formats to help you assess both formative and summative student learning according to NGSS.



Performance-Based Assessment

Name _____ Date _____

Choices, Choices, Choices

In this task, you will plan and conduct an investigation to test the responses of isopods, also knows as pill bugs, to a variety of stimuli. Then you will determine which stimuli attract pill bugs most strongly.

OBJECTIVE
- Plan and conduct an investigation to study characteristic pill bug behaviors.

PROCEDURE

1. Think about a pill bug's role in an ecosystem. What types of stimuli are pill bugs likely to respond to? List some possibilities here.

   _____

   _____

   _____

2. Select four stimuli to test. How can you determine whether a pill bug moves toward or away from your selected stimuli? For each stimulus, identify a pair of choices that can help you determine the pill bugs' response.

   Stimulus 1: _____ versus _____

   Stimulus 2: _____ versus _____

3. Using the materials provided, construct a choice chamber with two compartments. The choice chamber includes an opening in the middle that will allow pill bugs to move freely from one side to the other, similar to the illustration shown here.

   Caution: Use caution when working with scissors or other sharp objects.

MATERIALS

For each group
- box lid, cardboard
- cotton balls
- digital camera (optional)
- food samples (sugar, starch, protein)
- flashlight, LED
- tape, masking
- paper, black construction
- paper towels
- pill bugs
- container, plastic with lid
- scissors
- spray bottle
- water

For each student
- notebook
- pencil

Life Science Module B Performance-Based Assessment

Assess on All Dimensions

- Formal assessment questions **aligned to multiple dimensions** provide you with a complete picture of student understanding.
- A unique **3D Evaluation Rubric** helps you evaluate open-ended student responses and identify the underlying cause of student misunderstanding so that you can target remediation where it's most needed.

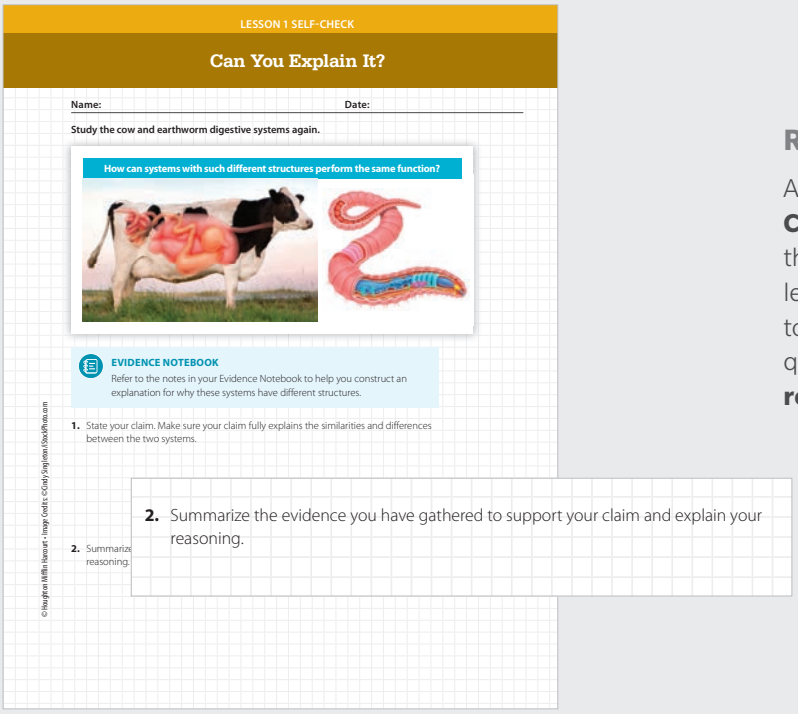
Performance-Based Assessment
Teacher Resources

Task 1 Performance Rubric	
Rating Scale	
3 Outstanding	**1 Needs Improvement**
2 Satisfactory	**0 Did Not Demonstrate Skill**

Skills	Rating
DCI.MS-LS1.D.1 Information Processing The student uses a choice chamber to determine which stimuli attract pill bugs.	
SEP.MS.H.2 Obtaining, Evaluating, and Communicating Information The student collects and effectively organizes data about pill bug responses to a variety of stimuli.	
CCC.MS.B.2 Cause and Effect The student identifies characteristic behavioral responses to a variety of stimuli.	
Additional: SEP.MS.C.2 Planning and Carrying Out Investigations The student plans and carries out two controlled investigations that identify which stimuli attract pill bugs.	
Total	

Address Scientific Practices with Authentic Performance Assessments

Performance-Based Assessments help you ensure that your students can perform the science and engineering practices called for by NGSS. And they also guide students toward **making connections** across Performance Expectations.


LESSON 1 SELF-CHECK

Can You Explain It?

Name: Date:

Study the cow and earthworm digestive systems again.

How can systems with such different structures perform the same function?

EVIDENCE NOTEBOOK

Refer to the notes in your Evidence Notebook to help you construct an explanation for why these systems have different structures.

1. State your claim. Make sure your claim fully explains the similarities and differences between the two systems.

2. Summarize the evidence you have gathered to support your claim and explain your reasoning.

2. Summarize the evidence you have gathered to support your claim and explain your reasoning.

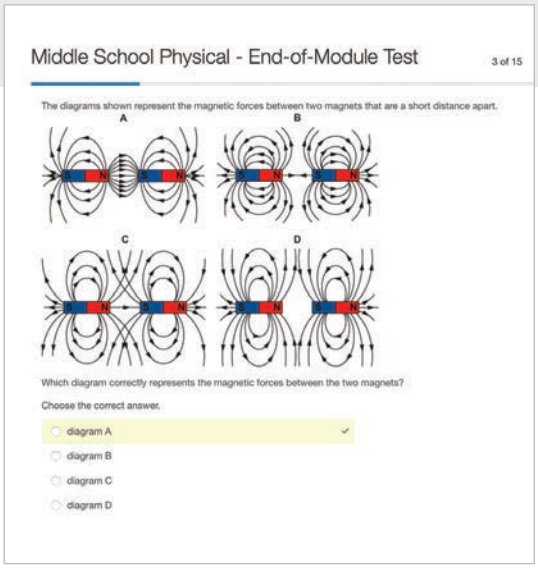
Life Science Module B Print Student Edition

Reflect on Evidence Gathered

At the end of a lesson, the **Lesson Self-Check** encourages students to reflect on the evidence they gathered throughout the lesson. They have another chance to respond to the discrepant phenomenon or central question of the lesson with **open-ended response** questions.

Scaffold to Higher-level Thinking Skills

Formal assessments build in complexity. **Unit Pretests** help you make sure students have the basic knowledge they need to enter the lessons. **Lesson Quizzes** provide a quick check that students are getting the 3D concepts. **Unit Tests** check for understanding and challenge students to apply what they've learned in new contexts. **Mid-Year and End-of-Year benchmark tests** help you make sure your students are on track to **achieve the Performance Expectations**. Parallel print assessments ensure that your students are challenged in the same way both on- and offline.



Physical Science Module K End-of-Module Test

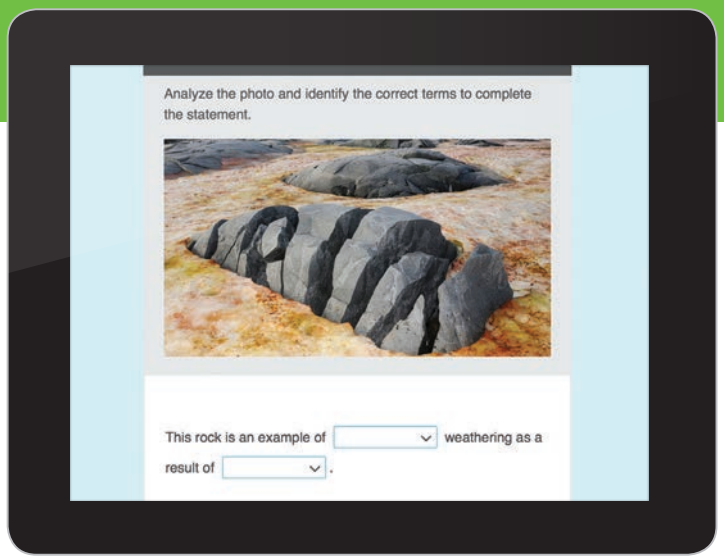
Physical Science Module K Online Student Edition

Prepare for High-Stakes Tests

Technology-enhanced assessment items (multi-select, drag and drop, etc.) prepare your students for modern **computer-based high-stakes tests**. Rigorous Mid-Year and End-of-Year benchmarks help you ensure that your students perform at a high depth of knowledge. Leveled benchmark tests help make the assessment accessible for all of your students.

Engage with Meaningful Technology

HMH Science Dimensions leverages the advantages of technology while prioritizing a **student-centered learning model**. Students can view videos and animations, interact with instructional images and text, enter responses, pursue their intellectual interests by choosing lesson paths, and enjoy simulation-based learning. All of these features help you maintain an **integrated three-dimensional approach** to learning science.



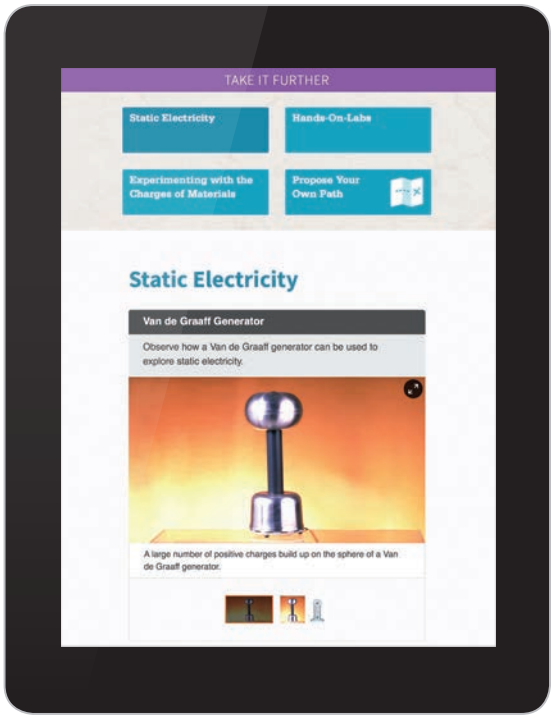
Earth and Space Sciences Module F Online Student Edition

Immersive Digital Curriculum

Online lessons are enriched above and beyond the print lessons with educational videos, learning interactivities, and places to save student work as **type-written responses** and **technology-enhanced item choices**. Students in Grades K–2 can even **voice-record** their responses! Vocabulary is highlighted and clickable, with point-of-use pop-up definitions.

Maximize Student Choice

The **Take It Further** feature at the end of each lesson maximizes the opportunity for students to elaborate further on what they have learned so far. By leveraging the power of technology, students can continue to go in depth on **topics of their choice**, to learn more and create stronger, more personal links to their learning.



Physical Science Module K Online Student Edition

Deepen Understanding with Open-Ended Simulations

Unique **You Solve It!** simulations provide completely **open-ended opportunities** for students to demonstrate their ability to problem solve and perform at the level described by the NGSS* Performance Expectations. The program encourages students to explore multiple answers to a problem and learn to develop explanations and defend their answers.

Earth and Space Sciences You Solve It!

HMH Field Trips

powered by

Google Expeditions

Explore Immersive Virtual Worlds with Google Expeditions

- As a Google content partner, HMH has developed field trips for Google Expeditions. Using a simple Google Cardboard™ device and a smartphone, students are swept away into **3D, 360-degree experiences** in 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.
- Experience these **HMH Virtual Field Trips** with your students: Big Cypress National Preserve, Florida Everglades, Saturn V Rocket at NASA, Orange Blossom Cannonball Train, Kennedy Space Center, and more!

Learn more at **hmhco.com/fieldtrips**

The Ultimate Online and Offline Program Experience

- Teachers can look forward to accessing ***HMH Science Dimensions*** on **Ed: Your Friend in Learning**. Ed is a new online learning system that combines the best of technology, HMH content, and instruction to personalize the teaching and learning experience for every teacher and student. Ed is designed to be a friend to learners while supporting teachers and simplifying their instructional practice.
- Additionally, program content can be accessed offline through the ***HMH Player***® app. This allows for **maximum compatibility in 1:1** or in **Bring Your Own Device** learning environments and with the wide variety of technology that students have at home.

Ed
your friend in learning

HMHPLAYER®
Making 1:1 Learning a Reality

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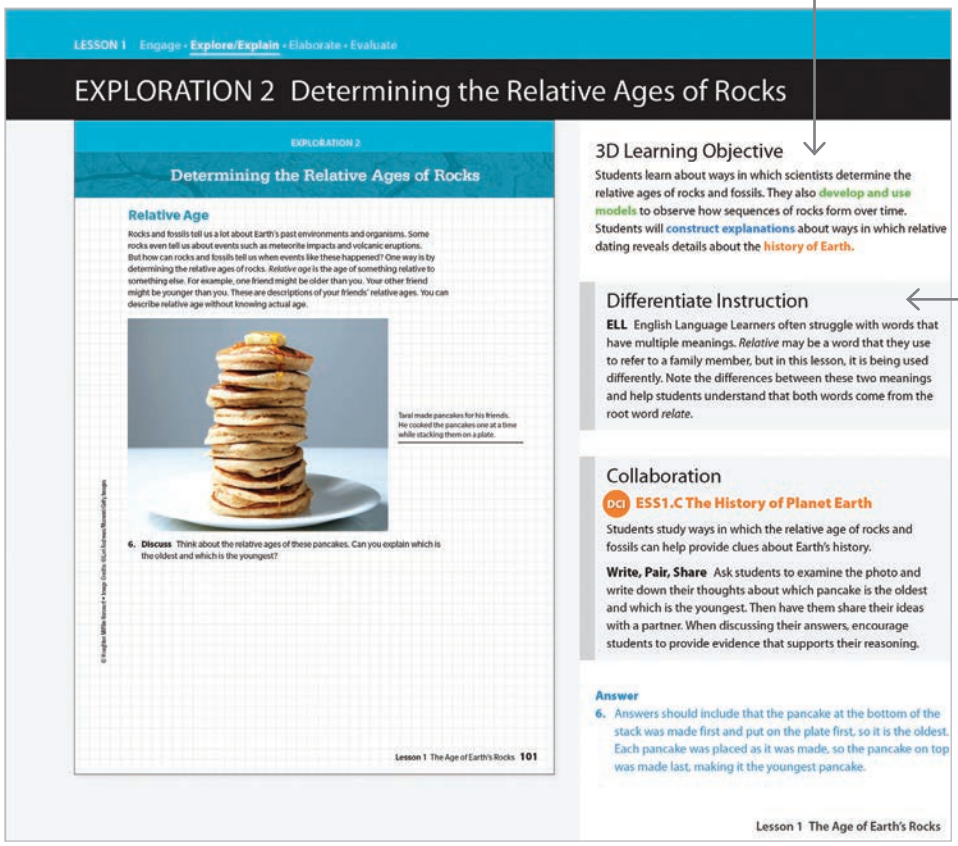
Three-Dimensional Learning Made Simple

HMH Science Dimensions expertly weaves the Three Dimensions of Learning into each lesson in order to meet the Performance Expectations (PEs). This braided approach takes the burden off of you while ensuring a **quality 3D learning experience** for your students.



LESSON 1 Engage • Explore/Explain • Elaborate • Evaluate

EXPLORATION 2 Determining the Relative Ages of Rocks

EXPLORATION 2

Determining the Relative Ages of Rocks

Relative Age

Rocks and fossils tell us a lot about Earth's past environments and organisms. Some rocks even tell us about events such as meteorite impacts and volcanic eruptions. But how can rocks and fossils tell us when events like these happened? One way is by determining the relative ages of rocks. *Relative age* is the age of something relative to something else. For example, one friend might be older than you. Your other friend might be younger than you. These are descriptions of your friends' relative ages. You can describe relative age without knowing actual age.

Tarel made pancakes for his friends. He cooked the pancakes one at a time while stacking them on a plate.

6. **Discuss** Think about the relative ages of these pancakes. Can you explain which is the oldest and which is the youngest?

Lesson 1 The Age of Earth's Rocks 101

3D Learning Objective

Students learn about ways in which scientists determine the relative ages of rocks and fossils. They also develop and use models to observe how sequences of rocks form over time. Students will construct explanations about ways in which relative dating reveals details about the history of Earth.

Differentiate Instruction

ELL English Language Learners often struggle with words that have multiple meanings. *Relative* may be a word that they use to refer to a family member, but in this lesson, it is being used differently. Note the differences between these two meanings and help students understand that both words come from the root word *relate*.

Collaboration

DCI ESS1.C The History of Planet Earth

Students study ways in which the relative age of rocks and fossils can help provide clues about Earth's history.

Write, Pair, Share Ask students to examine the photo and write down their thoughts about which pancake is the oldest and which is the youngest. Then have them share their ideas with a partner. When discussing their answers, encourage students to provide evidence that supports their reasoning.

Answer

6. Answers should include that the pancake at the bottom of the stack was made first and put on the plate first, so it is the oldest. Each pancake was placed as it was made, so the pancake on top was made last, making it the youngest pancake.

Lesson 1 The Age of Earth's Rocks

Earth and Space Sciences Module F Teacher Edition

3D Learning Objectives

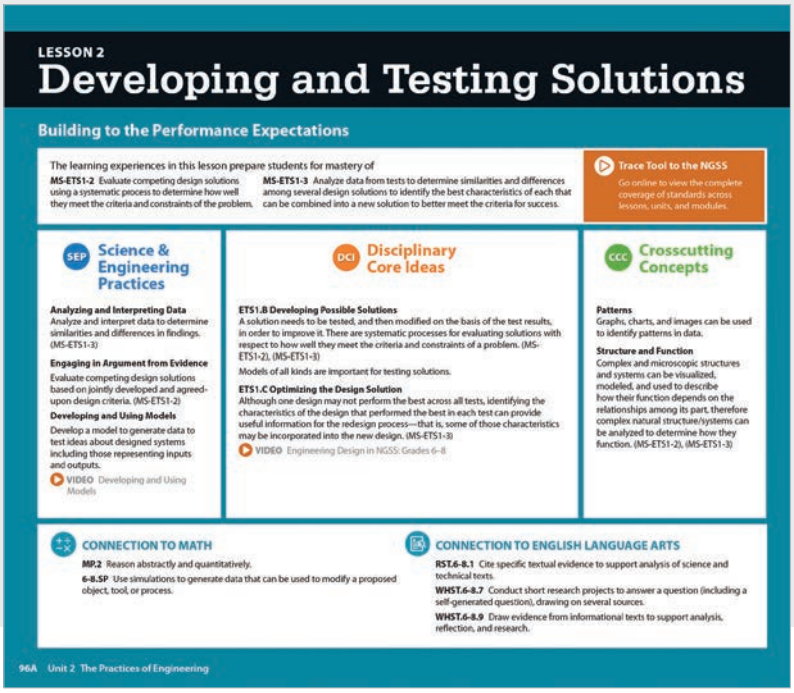
Each lesson has unique interrelated **3D Learning Objectives** that can be found in the Teacher Edition. The objective is generated from the SEPs, CCCs, and DCIs associated with the Performance Expectations correlated to the unit. These **custom stepping-stone objectives** ensure that the lessons cover 100% of the NGSS* material associated with the PEs.

Enrich the Learning Experience

Additional Collaboration; Differentiate Instruction; Formative Assessment; and Claims, Evidence, and Reasoning suggestions provide a wealth of support and resources.

Clearly Labeled NGSS References

The NGSS labeling in the Teacher Edition clearly identifies all the PEs, SEPs, DCIs, and CCCs of NGSS, including the math and ELA connections. This helps educators **identify the standards** that are being covered in any given lesson.



LESSON 2

Developing and Testing Solutions

Building to the Performance Expectations

The learning experiences in this lesson prepare students for mastery of

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Trace Tool to the NGSS

Go online to view the complete coverage of standards across lessons, units, and modules.

Science & Engineering Practices

Analyzing and Interpreting Data
Analyze and interpret data to determine similarities and differences in findings. (MS-ETS1-3)

Engaging in Argument from Evidence
Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2)

Developing and Using Models
Develop a model to generate data to test ideas about designed systems including those representing inputs and outputs.

VIDEO Developing and Using Models

Disciplinary Core Ideas

ETS1.B Developing Possible Solutions
A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3)

Models of all kinds are important for testing solutions.

ETS1.C Optimizing the Design Solution
Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)

VIDEO Engineering Design in NGSS: Grades 6–8

Crosscutting Concepts

Patterns
Graphs, charts, and images can be used to identify patterns in data.

Structure and Function
Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its part, therefore complex natural structure/systems can be analyzed to determine how they function. (MS-ETS1-2), (MS-ETS1-3)

CONNECTION TO MATH

MP.2 Reason abstractly and quantitatively.

6-8.SP Use simulations to generate data that can be used to modify a proposed object, tool, or process.

CONNECTION TO ENGLISH LANGUAGE ARTS

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources.

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

96A Unit 2 The Practices of Engineering

Engineering Module A Teacher Edition

Utilize the 5E Model

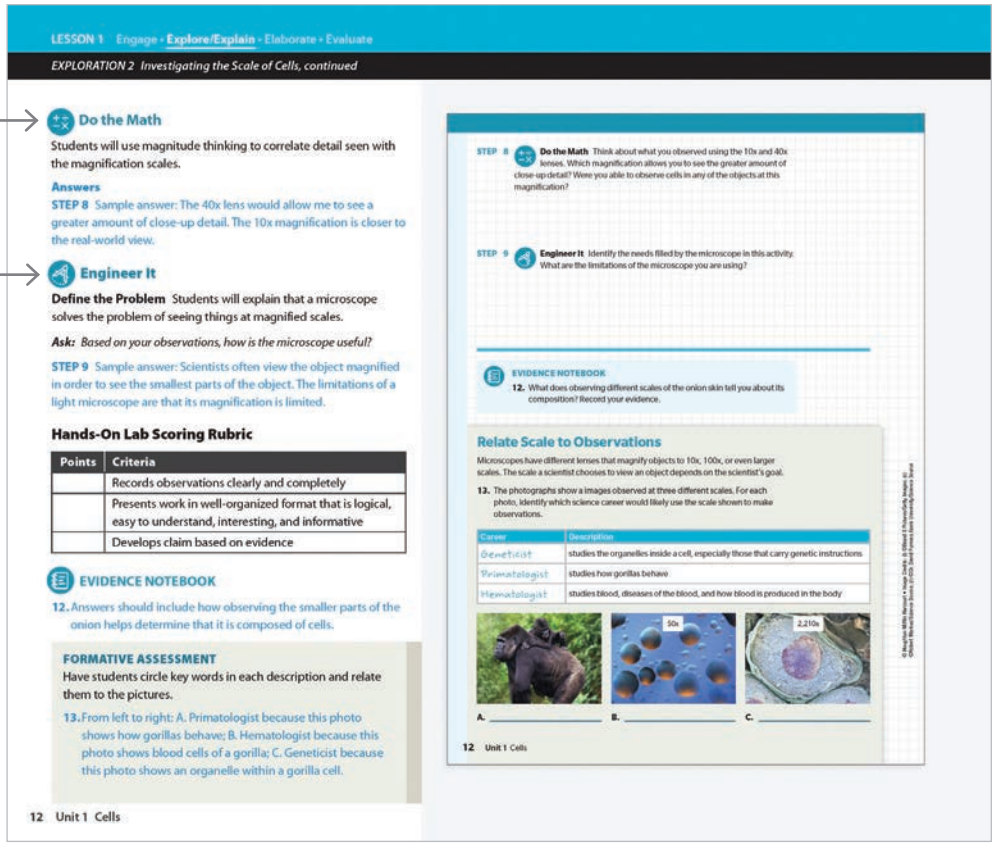
The **Teacher Edition** (online and print) is organized around the familiar **5E instructional model**. This helps to lower the learning curve and provide a solid foundation upon which to build an NGSS curriculum.

Incorporate English Language Arts and Math Connections

Strong math and reading skills are essential to ensuring STEM learning and science literacy. ***HMH Science Dimensions*** offers Common Core **Math and ELA connections** throughout the curriculum.

Integrate Engineering

The TE provides abundant opportunities for integrating engineering into the classroom.



LESSON 1 Engage • Explore/Explain • Elaborate • Evaluate

EXPLORATION 2 Investigating the Scale of Cells, continued

Do the Math

Students will use magnitude thinking to correlate detail seen with the magnification scales.

Answers

STEP 8 Sample answer: The 40x lens would allow me to see a greater amount of close-up detail. The 10x magnification is closer to the real-world view.

Engineer It

Define the Problem Students will explain that a microscope solves the problem of seeing things at magnified scales.

Ask: *Based on your observations, how is the microscope useful?*

STEP 9 Sample answer: Scientists often view the object magnified in order to see the smallest parts of the object. The limitations of a light microscope are that its magnification is limited.

Hands-On Lab Scoring Rubric

Points	Criteria
	Records observations clearly and completely
	Presents work in well-organized format that is logical, easy to understand, interesting, and informative
	Develops claim based on evidence

EVIDENCE NOTEBOOK

12. Answers should include how observing the smaller parts of the onion helps determine that it is composed of cells.

FORMATIVE ASSESSMENT

Have students circle key words in each description and relate them to the pictures.

13. From left to right: A. Primatologist because this photo shows how gorillas behave; B. Hematologist because this photo shows blood cells of a gorilla; C. Geneticist because this photo shows an organelle within a gorilla cell.

12 Unit 1 Cells

STEP 8 Do the Math Think about what you observed using the 10x and 40x lenses. Which magnification allows you to see the greater amount of close-up detail? Were you able to observe cells in any of the objects at this magnification?

STEP 9 Engineer It Identify the needs filled by the microscope in this activity. What are the limitations of the microscope you are using?

EVIDENCE NOTEBOOK

12. What does observing different scales of the onion skin tell you about its composition? Record your evidence.

Relate Scale to Observations

Microscopes have different lenses that magnify objects to 10x, 100x, or even larger scales. The scale a scientist chooses to view an object depends on the scientist's goal.

13. The photographs show a images observed at three different scales. For each photo, identify which science career would likely use the scale shown to make observations.

Career	Description
Geneticist	studies the organelles inside a cell, especially those that carry genetic instructions
Primatologist	studies how gorillas behave
Hematologist	studies blood, diseases of the blood, and how blood is produced in the body

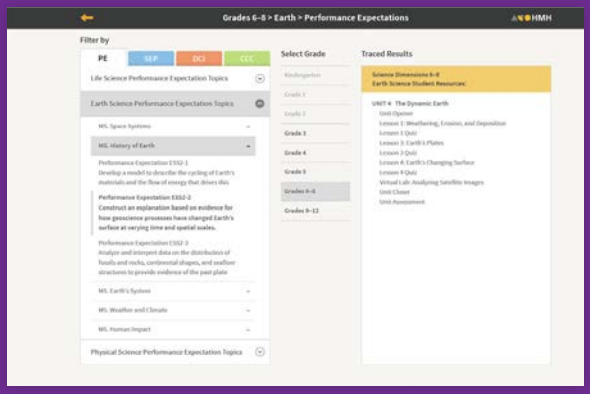
A. _____ B. _____ C. _____

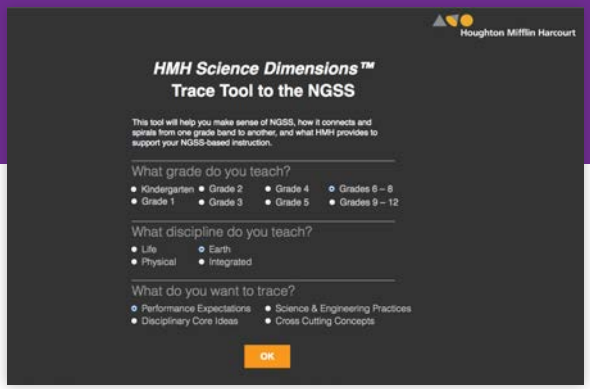
12 Unit 1 Cells

Life Science Module B Teacher Edition

Unmatched Professional Support Helps You Transition with Ease

An NGSS* curriculum requires a significantly different approach to teaching science, and although this new approach may be challenging, its **rewards** are immediate. HMH provides the support you need to make the transition to a **student-centered**, NGSS style of teaching.





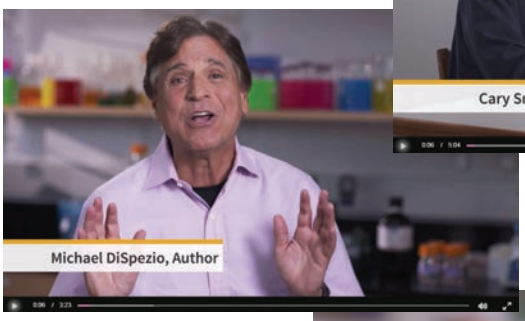
Understand Where Your Instruction Fits

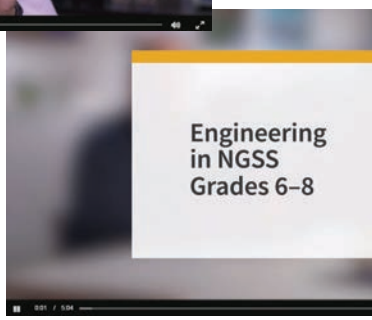
- The ***HMH Science Dimensions* Trace Tool to the NGSS** helps you make sense of the standards, understand how they connect and spiral from one grade to another, and **identify HMH resources** to support your NGSS-based instruction.
- You can **trace the standards** by PEs, SEPs, CCCs, or DCIs. When you click on a standard, you can view where in the program that standard is covered.
- But the **Trace Tool** is more powerful than a typical correlation—it also shows you **how each standard and dimension spirals** throughout the entire K–12 sequence. See at a glance what students should know already, and what you're preparing them for.

See NGSS in Action

Embedded professional development videos help teachers better prepare for this new approach to science education. Just-in-time videos featuring our **dynamic consulting authors** guide teachers through the key approaches that ensure NGSS success.

- » **Foundation** videos help educators and parents better understand NGSS, as well as the background that led up to their development.
- » **Engineering** videos support educators as they incorporate the design process into their classrooms.
- » **Challenging Content** videos for Grades 6–12 help educators know how to address specific content areas that students tend to struggle with in an NGSS curriculum.





Professional Support Videos

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Professional Learning for *HMH Science Dimensions*

Our mission is to advance yours.

A Strong Start

Getting Started is Included with Purchase!

The ***Getting Started with* HMH Science Dimensions *Course*** provides you with an overview of the program from both a teacher's and student's perspective.

Deepen Mastery

To accelerate your learning from the ***Getting Started Course***, **Follow-Up Courses** focus on planning, monitoring student progress, supporting English learners and assessment.

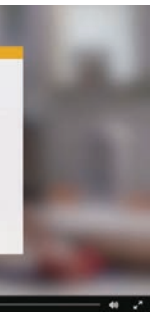
Coaching

Our **Team** and **Individual Coaching** will ensure you are confident and prepared to deliver instruction that addresses the needs of the changing science classroom. HMH Coaches work side by side with you, supporting 3D Learning, student engagement, differentiated support, science literacy, literacy across the curriculum, 21st-century skills and STEM applications.

Need More Help?

When implementing ***HMH Science Dimensions***, you may have questions regarding instruction, pedagogy, and best practices. **AskHMH**™ provides access to program experts who can support you.

hmhco.com/professionalservices



Program Components

Student Resources	Print	Online
Student Edition	•	•
Student Edition, Interactive Online Edition		•
ScienceSaurus®	•	•
Math Handbook		•
English Language Arts Handbook		•
Science and Engineering Practices Handbook		•
Crosscutting Concepts Handbook		•
You Solve It!		•
Teacher Resources	**Print**	**Online**
Teacher Edition	•	•
Teacher Edition, Interactive Online Edition		•
Google Expeditions Teacher Guide		•
Assessment Guide (including Performance-Based Assessments)	•	•
Online Assessment		•

With its cohesive, spiraled approach to meeting the new standards, ***HMH Science Dimensions*** provides a consistent and engaging experience from kindergarten through high school. ***HMH Science Dimensions*** for Grades K–5 is available as a softcover, consumable write-in worktext for each grade, while Grades 6–8 content is available as 12 modules for Life, Earth & Space, Physical Science, and Engineering. ***HMH Science Dimensions*** for high school includes ***Biology, Earth & Space Science***, ***Chemistry,*** and ***Physics*** (***Chemistry*** and ***Physics*** will be available in 2018.)

Three Ways to Learn More about This Groundbreaking New Program:

1. Visit **hmhco.com/ScienceDimensions**
2. Contact your HMH Account Executive: **hmhco.force.com/replocator**
3. Request access to review online materials: **hmhco.com/MeetEd**

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