

Inspire Science

Explore Our Phenomenal World

inspire-science.com/6-12



Inspire Science

Explore Our Phenomenal World



A New Phenomenon for Your Classroom

Inspire Science empowers students to explore and learn from our world's amazing natural phenomena in exciting, hands-on ways.

Inspire Science brings science off of the page and beyond the four walls of the classroom - into the exciting world in which we live with a wealth of online and offline resources. It goes much further as it dives deep into the incredible natural phenomena all around us to spark students' imagination and inspire success.

By fostering student's innate **curiosity**, you elevate their critical thinking.

By facilitating hands-on **investigation**, you deepen their understanding.

By encouraging creative problem-solving, you inspire their **innovation**.





A History of Innovation

THOMAS EDISON

Invention: Electrical Light

Date of Invention: 1879

America's Greatest Inventor; Thomas Edison:

On February 11, 1847, an inventor and businessman was born in Milan, Ohio who would influence the world. Thomas Edison has been described as America's greatest inventor, holding 1093 US patents and hundreds more across the world. His most famous patent was for the incandescent light bulb.

Edison began his work on the incandescent light bulb in 1878. He wanted to invent a light bulb that would replace gas lights and last for extended periods of time. After much trial and error and numerous attempts with different types of materials he finally succeeded in lighting the first incandescent light bulb on October 22, 1879, which stayed lit for roughly 14 hours. The success of the light bulb lead to many patents which he earned the label as America's Greatest Inventor.

Edison's success with the light bulb led to many more inventions and he launched a number of different businesses in the United States and worldwide. Throughout history, Thomas Edison's innovations have revolutionized life as we know it and influenced many inventors, including Nikola Tesla.

"I have not failed. I've just found 10,000 ways that won't work."

—Thomas Edison

Thomas Edison

NIKOLA TESLA

Invention: The Tesla Coil

Date of Invention: 1905

Nikola Tesla

Nikola Tesla:

Nikola Tesla was born on July 10, 1856 in Smiljan, Croatia. He was an inventor, electrical and mechanical engineer, and physicist. He is best known for his ground-breaking contributions to the design of the alternating-current (AC) electrical system.

From a young age, Tesla showed an interest in science. After working for Thomas Edison for a year, Tesla struck out on his own and received more than 30 patents for his inventions. Tesla began working with George Westinghouse after Tesla gave a speech about alternating-current electrical systems. In 1891 Tesla invented the Tesla coil that is an induction coil used in radio communications. Throughout his life, Nikola Tesla obtained 278 patents.

Today we use Tesla's inventions in many ways, most notably every time we 'flip a switch' to turn on a light!

"The day science begins to study non-physical phenomena, it will make more progress in one decade than in all the previous centuries of its existence."

— Nikola Tesla

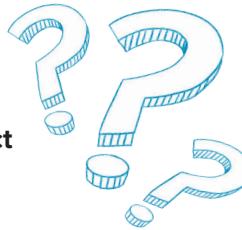
Program Overview 3

A New Level of Innovation

Let's Embrace Change, Together.

Change is on the horizon — as schools transition to new standards, a number of questions will no doubt be at the forefront of every science educator's mind...

- **How can I easily transition?**
- **How do I make sure my students are engaged with this new approach?**
- **How will I manage the increase in inquiry and hands-on activities with everything else I have to do?**
- **How can I ensure all my students have the same chance for success?**
- **How can I meet all my classroom needs?**
- **How might my students impact our world someday?**



The *Inspire Science* development team at McGraw-Hill Education has put solutions to these challenges (and many more) at the forefront of our work, through years of close collaboration with educators like you. The result - a user-friendly approach to implementation, so you can focus your energy on the art of teaching, and the joy of inspiring the next generation of innovators.

Let's take a look at how *Inspire Science* will help you with a smooth transition.

A Smooth Transition

Inspire Science isn't just about a new set of standards. It's a new philosophy for K-12 Science education focused on helping you prepare students for career and college readiness.

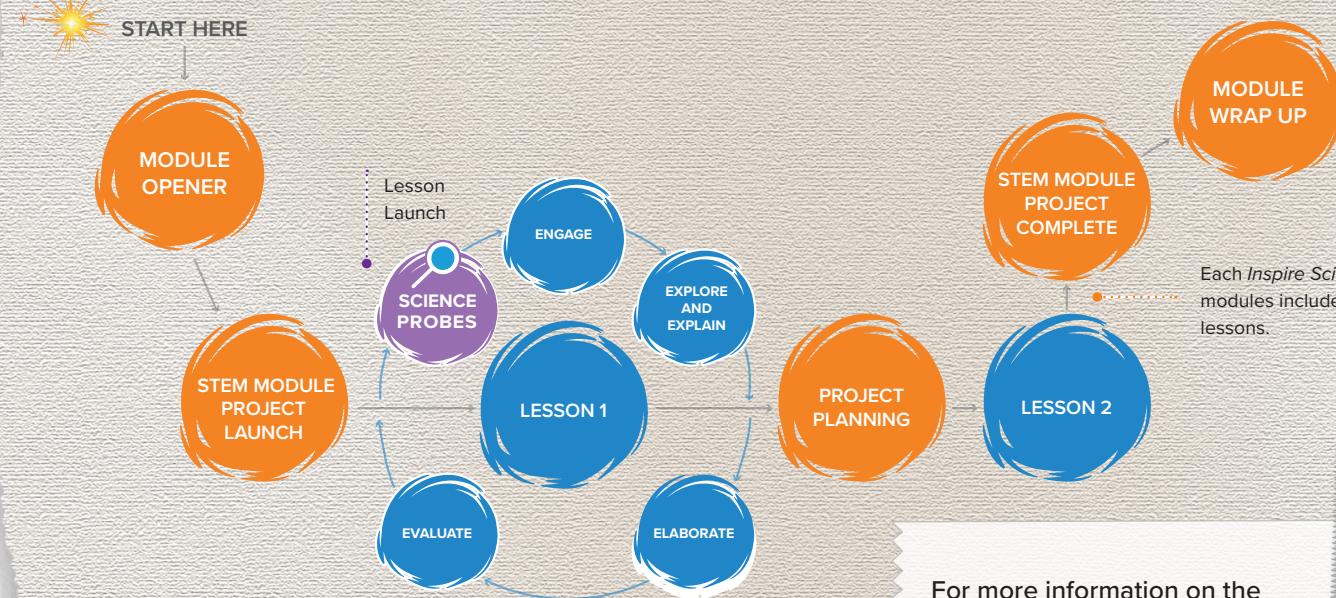
At McGraw-Hill Education, we understand that making the shift to new standards can be challenging, and we want to help make it easier on you. That's why the *Inspire Science* team has been studying the standards for years, while testing ideas with teachers like you to create a user-friendly experience for both teachers and students.





User-Friendly Instructional Model

Inspire Science provides the proven and research-driven 5E instructional model enhanced to align with the demands for three-dimensional, phenomena-driven learning.



Support for New Standards

The transition to new standards requires a few shifts in science instruction and learning, and *Inspire Science* supports you through each one.

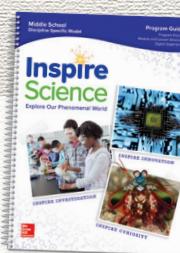
- Progressive, Three-Dimensional Learning
- Depth Over Breadth
- Phenomena-Driven, Inquiry-Based, Hands-On Learning
- Performance-Based Testing
- Integrated Engineering



Built with Teachers, Since the Beginning

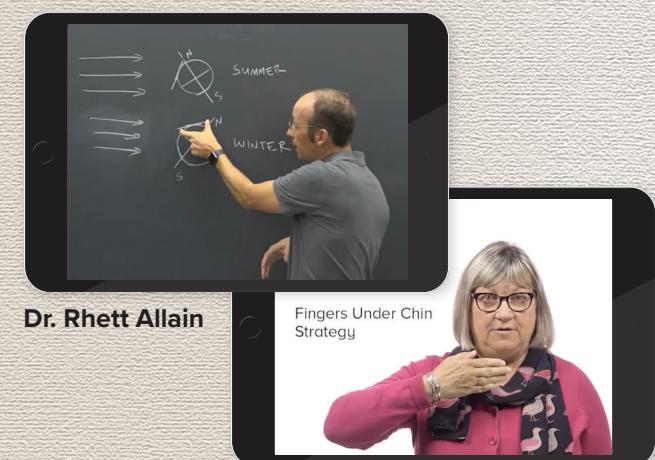
Our close collaboration with educators just like you has resulted in a tried-and-true approach to that you'll love.

For more information on the *Inspire Science* Instructional Model see the Program Guide



Professional Learning When You Need It

Inspire Science includes an expansive library of relevant, self-paced, professional learning courses to support implementation, instructional progression and mastery — all available 24/7.



Next Generation Engagement

Ensure Student Engagement

As educators, we understand what happens when students are truly engaged: a classroom full of excitement, increased focus, and deeper conceptual understanding.

That's why *Inspire Science* places student engagement at the forefront. Each module and lesson is designed to tap into students' natural curiosity about the world around them through the investigation of real-world phenomena. Student engagement is further fueled through an innovative digital experience, and the connections to real-world applications with the STEM Career Connections and STEM Module Projects.

ENCOUNTER THE INSPIRATION

How does *Inspire Science* Ensure a Smooth Transition to New Standards?

Let's look at a few inspiring ways *Inspire Science* will help you make the transition.

Lift & Learn

Phenomena-Driven Learning

Inspire Science places natural phenomena at center stage within each module and lesson. By introducing an anchoring phenomenon in each module, supported by lesson-level investigative phenomena, students dig deep into key science and engineering concepts.

ENCOUNTER THE PHENOMENON

The Water Cycle

ENCOUNTER THE PHENOMENON

How might the water you drink today be the same water a dinosaur drank millions of years ago?

Collaborate With a partner, brainstorm how you could be drinking the same water a dinosaur drank millions of years ago. Record or illustrate your thoughts and reasoning below.

GO ONLINE Watch the video. Watch the video to see this phenomenon in action.

Who Are You? Watch the video. Watch the video to see this phenomenon in action.

Module: The Water Cycle 3

Designed for the Digital Generation

Inspire Science is infused with highly engaging interactive experiences designed for today's digitally-native students. Interactive simulations, 360 videos, 3D models, learning-based games, and immersive science content videos will keep students' attention and inspire them to explore and discover.

VIRTUAL LABS

Behavior of Gases

What factors influence the pressure of a gas in a container?

Gas is all the matter in a container. Gases expand to fill the space available to them and can be squeezed into a smaller space. A gas has neither a definite shape nor a definite volume.

Gases consist of billions of tiny particles. When a gas is contained, these particles are constantly colliding and exerting pressure on the container. Pressure is the force of exerted by a unit of area: $P = F/A$. The pascal (Pa) is the standard unit of pressure. Because this unit is so small, most pressures are given in kilopascals (kPa).

In the Virtual Lab, you will explore Boyle's Law and Charles's Law. Boyle's Law relates pressure and volume. Charles's Law relates temperature and volume. These two laws can be combined to relate pressure, volume, and temperature.

Journal **Calculator** **Table**

Phenomenon Videos

Virtual Labs

Student-Led, Collaborative Learning

The more involved, the more engaged. With *Inspire Science*, students take a leadership role in their learning experience and develop teamwork and ideation skills through deep collaboration with their classmates at many points during each module and lesson.

Inquiry-Based Approach

Inquiry-driven learning helps students understand how to ask deeper questions and think critically as they answer science questions and design creative solutions to real-world problems. With *Inspire Science*, students learn how to become great investigators through a variety of inquiry activities that connect to the Science and Engineering Practices.

INQUIRY ACTIVITIES

LAB Photosynthesis and Light

It might help to think of photosynthesis as a process of giving and taking. Light energy is given to the plant, and carbon dioxide and water are taken in. The plant uses this energy to make its own food. How does light energy affect the rate of photosynthesis? Can you describe how the intensity of light affects the rate of photosynthesis?

Materials

test tube
clips
drill
cork or block
colored pencils
scissors
balance
thermometer

Procedure

1. Clean and assemble a lab safety form.
2. Cut the bottom of an elodea stem at an angle, and lightly create the cut ends. Place the test tube in a test tube with the cut ends facing up.
3. Fill the test tube with water. Stand the test tube and a thermometer in a beaker of water. Place the elodea in the test tube with the bottom of the stem submerged in the water. The bottom of the stem should not touch the bottom of the beaker. You may need a ring stand for this.
4. Place the beaker containing your test tube in a area of direct sunlight. Observe the elodea over time. Record the temperature and initial observations.

INVESTIGATION

Switching Sides

It might help to think of the atoms in the reactants? Do they all get used to make the products? Do some disappear? Explore the simulation to find out!

Explore the PhET interactive simulation: [Reactants, Products, and Leftovers](#)

PHET
INTERACTIVE SIMULATIONS
University of Colorado Boulder

Simulations

Research

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Hands-On Support

Enjoy the Increase in Inquiry-Based Hands-On Activities

New standards require a marked increase in inquiry-based learning, resulting in more hands-on activities. This shift makes for a more exciting classroom experience, but it also comes with new logistical challenges that can be difficult to manage. With *Inspire Science*, we've provided a number of support structures to help make this shift more manageable and more fun for you and your students.



ENCOUNTER THE INSPIRATION

How will *Inspire Science* Keep My Students Engaged?

Take a closer look at some of the features in *Inspire Science* that support deeper investigation, better engagement, and greater understanding.

Lift & Learn



Inquiry Activity Planners

The *Inspire Science* Inquiry Activity Planners make preparing for hands-on activities easier than ever — listing out all the materials needed for the entire module and clearly noting which materials are included in the Collaboration Kits.

Module: **The Water Cycle**

Inquiry Activity Planner

In this module, students will explore water reservoirs and how water cycles among Earth's systems. They will develop and use a model of the water cycle.

Lesson	Inquiry Activity	Materials	
		Consumable	Non-Consumable
Lesson 1	LAB Into Thin Air	30 min	squares of brown paper towel (2), paper plates (2), 10 mL of room temperature water, water dropper, light source, metric ruler, thermometer (2), stopwatch
	LAB Out of Thin Air	30 min	ice, cold water (200 mL), warm water (125 mL), resealable plastic bag, 500-mL beaker

Engaging Inquiry Activities with Options

Every lesson in *Inspire Science* offers multiple inquiry-based activities, along with techniques that scientists and engineers use in the real world. These inquiry activities include differentiation strategies (through the Inquiry Spectrum), and various pacing options ranging from simple investigations to complex lab explorations.

The Inquiry Spectrum

Depending upon the available time and the topic being investigated, structured inquiry might be perfect, or your class may be ready for open inquiry. The *Inspire Science* Inquiry Spectrum provides flexible options to adjust the inquiry level to align with the learning needs of each student.

Inquiry Spectrum

Lab activities can be altered to one of three levels of inquiry based on student need.

Structured Inquiry

In this Inquiry Activity, students are given a question to investigate and procedure to follow.

Guided Inquiry

To make this a guided inquiry activity, have students plan their own investigation by selecting their own volumes and temperatures of water, making their predictions, and conducting their plan.

Open Inquiry

To make this an open inquiry activity, have students develop their own question about the link between amount of matter and its energy to investigate and design the investigation.

Collaboration Kits

Nothing is more engaging than rolling up your sleeves and digging into hands-on activities, but we understand managing the materials to support hands-on time can be a challenge. Developed specifically for group collaboration, the *Inspire Science* Collaboration Kits make hands-on activities a breeze — freeing you to focus on the activity rather than planning and hunting for supplies.



ENCOUNTER THE INSPIRATION

How does Inspire Science
Make the Increase in
Inquiry-Based Hands-On
Activities Easier for
Educators?

Let's look at some of the ways
Inspire Science will help you look
forward to more hands-on learning.

Lift &
Learn

Ensure All Students Have Success

Students of all learning levels have questions about their world and phenomena they see every day, and they need equal access to instruction, support, and content.

Inspire Science fosters deep learning for every student by providing built-in supports for differentiated instruction, EL strategies, and language-building resources at the module level and at multiple points throughout each lesson. Each student is given an opportunity to construct explanations of phenomena and use evidence-based logic to make connections, building critical skills at every step.





Differentiated Instruction

Inspire Science incorporates the research-based Universal Design Learning Principles to ensure that all students have access to rigorous curriculum. Robust differentiation support is found within the Teacher's Edition.

Module: The Water Cycle

Inspire All Students

Strategies to scaffold your instruction and plan for successful teaching for all students.

Differentiated Instruction

Help students connect the key module concepts that water cycles among Earth's systems.

AL Approaching Level

Have students work with BL students to design cards for a game in which players answer questions about the water cycle. Students can write a question on one side of each card and an answer on the other side. Encourage students to illustrate their cards.

BL Beyond Level

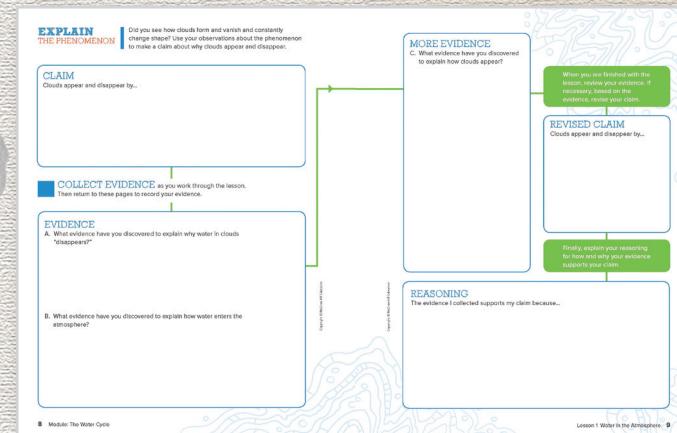
Have students design a game in which players answer questions about the water cycle. Students should write at least 15 questions of varying levels of difficulty about the water cycle. They should also brainstorm rules for the game, such as how points are gained or lost.

LEARNSMART®

LearnSmart® with SmartBook® transforms the way students read. A proven, adaptive learning program, LearnSmart individualizes learning to help students study more efficiently and retain more knowledge.

CER Framework

The Claim, Evidence, Reasoning (CER) framework in *Inspire Science* — which becomes increasingly sophisticated from K-12 — ensures every student is engaged in rigorous scientific inquiry and argument from evidence.



English Language Support

Rooted in learning sciences research, *Inspire Science* applies the best instructional practices for teaching EL students in alignment with the ELD standards. Each module and lesson has scaffolded activities that offer students of any level of English language proficiency the opportunity to engage in academically challenging science and engineering content while supporting language acquisition.

English-Language Support

Graphic Organizers

Utilize charts and graphic organizers to help students understand how water cycles among Earth's systems. Throughout the module, draw their attention to the forces that drive the cycling of water, supporting a discussion of the different ways water cycles among land, ocean, and atmosphere, and eliciting examples. Encourage students to add details to the graphic organizer.

EMERGING

Web Diagram At the beginning of the module, make a poster with a web diagram. Write the phrase water cycle in the middle circle. Say: In this module, we will learn about the water cycle. As we learn about the water cycle, let's make a web diagram. Let's make each way in a circle around water cycle. Invite students to add pictures or words to describe or give examples of the ways water cycles among land, ocean, and atmosphere on sticky notes and add them to the diagram.

Additional English-language support is available in your Teacher's Edition.

EXPANDING

Word Wall Say: In this module, we will learn about the water cycle. As we study different ways water cycles, let's write each on our word wall. As you come across these different ways water cycles in the module, add them to the word wall. Ask students to write definitions of the words, as well as examples. For example, let's say the word 'atmosphere'. Ask students to write the definition of atmosphere, as well as examples. Encourage students to add details to the graphic organizer.

BRIDGING

Concept Web As you come across different concepts in the module, have students create concept webs in their notebooks. For example, for ways water cycles through the atmosphere, have students write the term Atmosphere in the middle of the concept web. Encourage them to add words that relate to the concept web.

ELL Support ELL.RI.5.2: Guide students in using a select number of academic and domain-specific words as well as knowledge of affixes to discuss why clouds change.

EMERGING Demonstrate the meanings of appear and disappear with gestures and classroom realia. Support students in answering the first question with a sentence frame: Parts of the cloud seemed to ... and ...

EXPANDING Discuss the meanings of appear and disappear with gestures and classroom realia. Support students in answering the first question with a sentence frame: Parts of the ... seemed to ... and ...

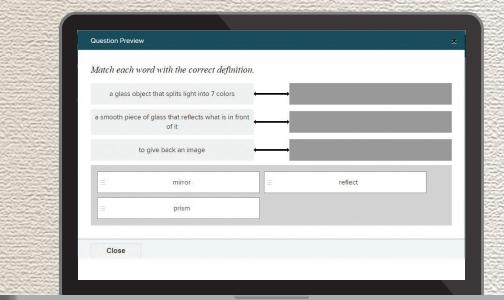
BRIDGING Elicit what the prefix dis- means in the context of disappear. Then have students answer the two questions. In their responses to the second question, encourage students to use opinion words/phrases such as *Maybe* or *I think*, as well as words that express reason, like *because*.

Next Generation Assessments

Ensuring students are well prepared for the standardized can seem daunting, but with the *Inspire Science*'s next generation assessment tools, in partnership with Measured Progress (STEM Gauge), you'll know what to expect and how to prepare your students for success with mastery of the Performance Expectations.

Online Assessment Center

GO ONLINE



Designed to Fit Any Classroom

Resources for Every Classroom

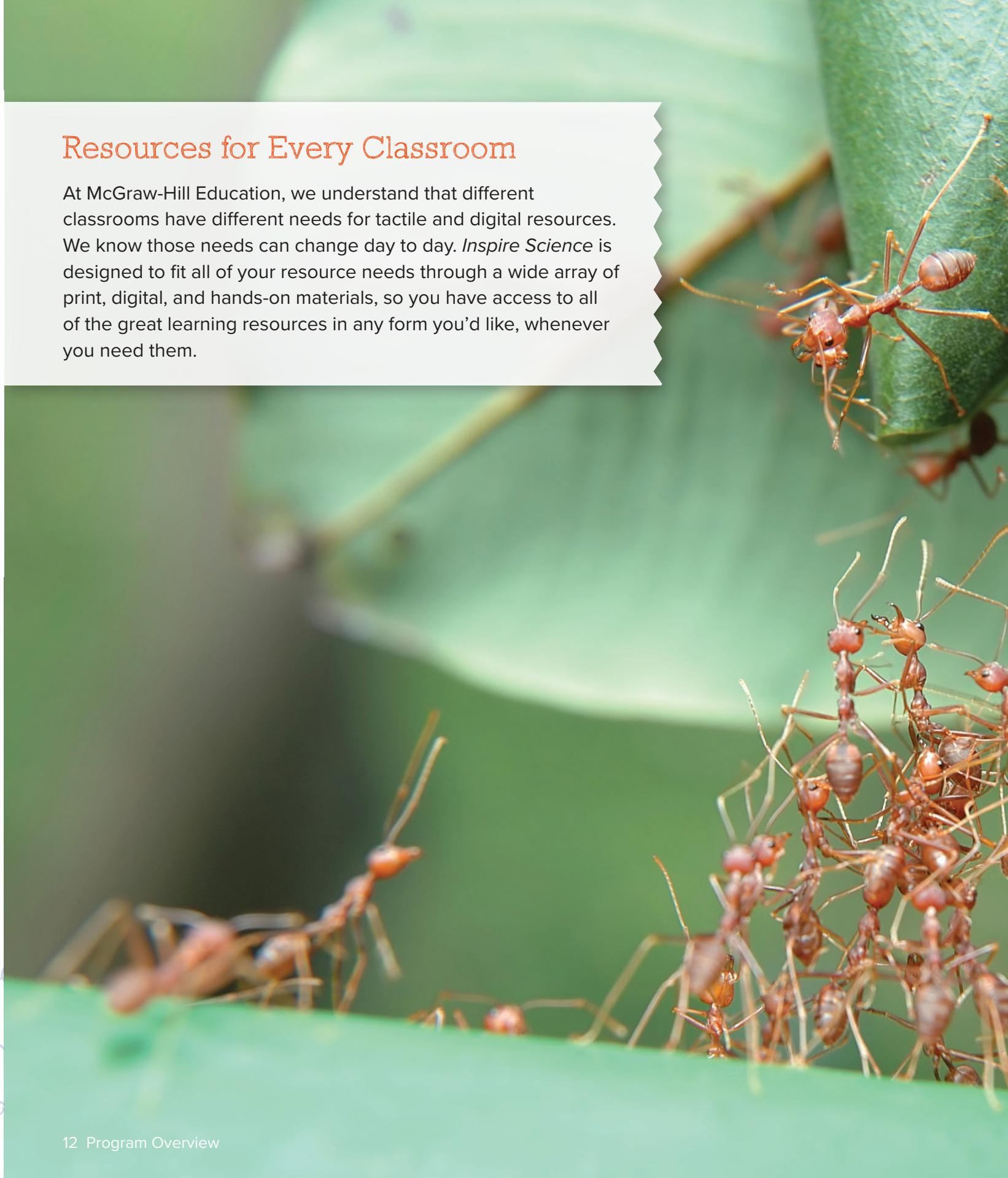
At McGraw-Hill Education, we understand that different classrooms have different needs for tactile and digital resources. We know those needs can change day to day. *Inspire Science* is designed to fit all of your resource needs through a wide array of print, digital, and hands-on materials, so you have access to all of the great learning resources in any form you'd like, whenever you need them.

ENCOUNTER THE INSPIRATION

How does Inspire Science Inspire All Students?

Let's look at some of the practical ways this program inspires all students with equal access to rigorous science content.

Lift &
Learn





Print Resources

Every *Inspire Science* print book includes a digital companion to compliment the digital interactive resources such as simulations, 3D models, videos, and adaptive learning.

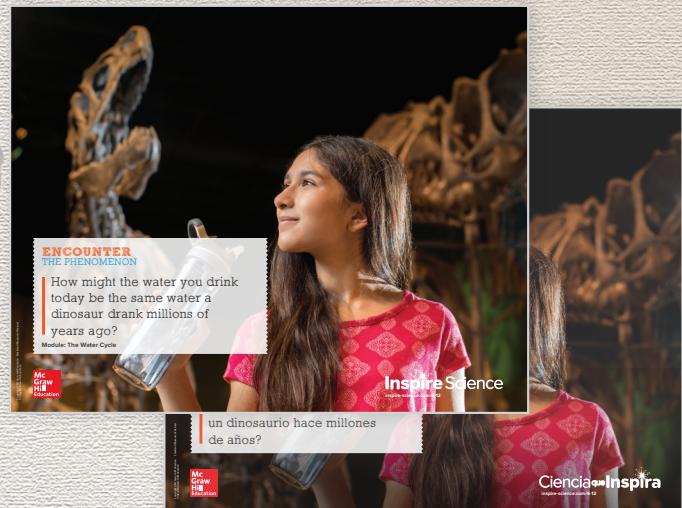
TEACHER'S AND STUDENT EDITION

(Earth and Space, Life Science, Physical Science, Four Units Per Grade)



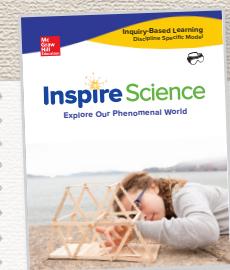
BILINGUAL POSTERS

The bilingual Module Phenomenon Posters are a great way to get students thinking about the phenomenon in focus in each module. There are also posters for the Science and Engineering Practices and the Engineering Design Process as friendly reminders for these key concepts. These bilingual posters include English on one side, and Spanish on the other.



Collaboration Kits

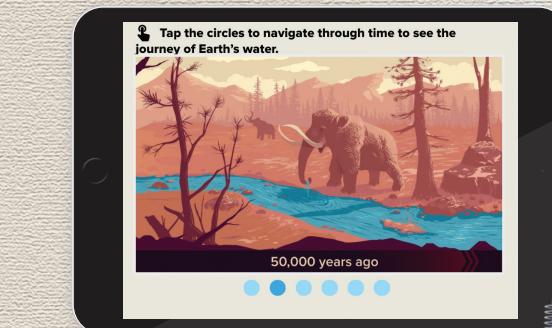
Inspire Science Collaboration Kits make planning for hands-on time easier, so you can focus more of your time on the activities than the planning. Each Collaboration Kit contains the materials needed for the hands-on inquiry activities, organized by unit and module.



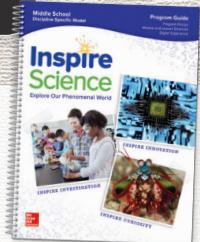
See the Collaboration Kit brochure to learn more about what each unit kit includes.

Digital Resources

In addition to the digital versions of each print book, *Inspire Science* provides a digital experience designed with advantages for both you and your students, including innovative interactives, videos, simulations, virtual labs, personal tutors, and more.



See the Digital Experience section of the Program Guide to learn more about these engaging interactives.



A Future Full of Possibilities

Let Them Dream Big

With the emphasis *Inspire Science* places on curiosity, investigative skills, and innovative thinking, just imagine what the students in your classroom today might dream up to improve our lives someday.

ENCOUNTER THE INSPIRATION

How does *Inspire Science* Meet All of My Classroom Needs for Print, Digital, Hands-On, and Spanish Resources?

Let's look at how with this program, you'll have everything you need for success.

Lift &
Learn





A Future Full of Innovation

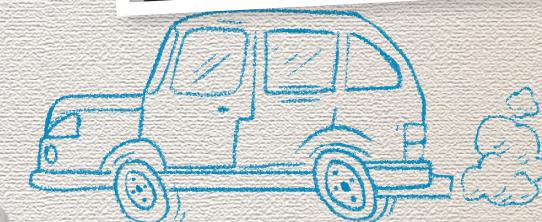
With the creative thinking and problem-solving skills your students will build with *Inspire Science*, they will have so many opportunities to impact the world. What problems will you inspire them to solve in the future?

Innovative Solutions for Global Warming

New solutions to reduce carbon emissions and clean up the carbon from our atmosphere?

Practical fuel cell transportation to power cars from water, emitting only steam?

An influential role in global carbon emissions management?



Innovations in Health Care and Disease Management

Advances in cellular immunotherapy treatments to leverage our own immune systems to stop cancer and diseases in their tracks?

Advances in using robotics for healing and repairing the human body?

New ideas for identifying and stopping diseases before they happen?



Innovations for Natural Resources

Practical ways to harness energy from the ocean waves?

Creative solutions to food creation and distribution to address world hunger?





ENCOUNTER THE INSPIRATION

How Might the Future
Innovators Impact
Our World Someday?

We know that students in our classrooms today have the potential to solve the problems of tomorrow. *Inspire Science* is designed to help you build the skills students need to carry on the legacy of inspired thinking.

Let's look at some of the possibilities for the future innovators.



**Lift &
Learn**



Inspire Science



Inspire Curiosity



Inspire Investigation



Inspire Innovation