



 **West
Virginia**
**Inspire
Science**

Inspiring the Next Generation of Innovators

While career opportunities in Science, Technology, Engineering, and Math (STEM) increase each year, qualified candidates for these careers continue to fall short. This is known as the STEM Gap. This gap represents a great opportunity for the students in your classrooms today to become the innovators of the future.

West Virginia Inspire Science helps students build innovative thinking skills by empowering them to explore and learn from our world's amazing natural phenomena in exciting, hands-on ways.

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**.

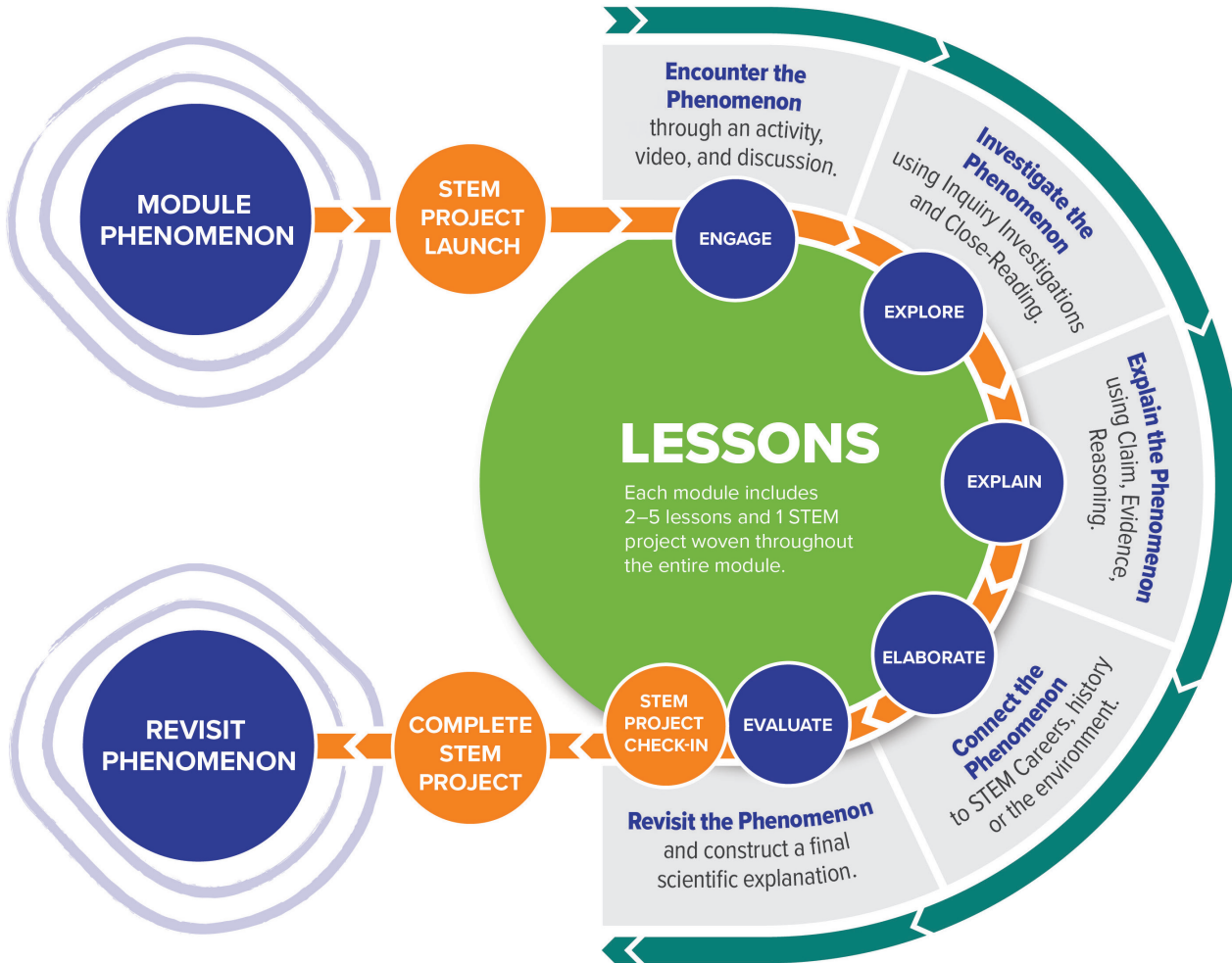
Meeting West Virginia College and Career Readiness Science Standards

West Virginia College and Career Readiness Science Standards is a new philosophy for K–12 Science education focused on helping you prepare students for career and college readiness.

That's why the *West Virginia Inspire Science* team has studied the new standards, while testing ideas with teachers like you to create a user-friendly experience for both teachers and students.

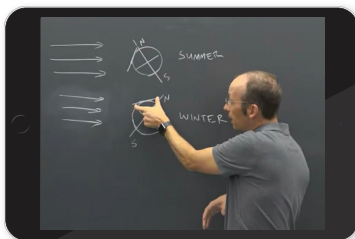
User-Friendly Instructional Model

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



Professional Learning When You Need It

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



Dr. Rhett Allain



Page Keeley, M.Ed.

To begin exploring West Virginia Inspire Science digital, use the following login credentials.

Go to my.mheducation.com

Username: **WVScience21**

Password: **WVScience21**

Encounter the Phenomenon

West Virginia 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 connections to real-world applications with the STEM Career Connections and STEM Module Projects.

Phenomena-Driven Learning

West Virginia 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.



Designed for the Digital Generation

West Virginia 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.

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 West Virginia Inspire Science, students learn how to become great investigators through a variety of inquiry activities that connect to the Science and Engineering Practices.

Phenomenon Videos

Screenshot of a 'Behavior of Gases' virtual lab interface. It shows a piston and cylinder simulation with a play button overlay. The interface includes a 'Temperature' gauge and a 'Volume' gauge. Text on the left explains the behavior of gases and mentions Boyle's Law and Charles's Law.

Virtual Labs

INQUIRY ACTIVITIES

A collection of inquiry activity materials including a 'LAB Photosynthesis and Light' worksheet and a 'PIET Interactive Simulations' tablet screen. The worksheet includes a title, objectives, materials, and a procedure. The tablet screen shows a simulation interface with various controls and data displays.

Simulations

Research

Hands-On Learning

West Virginia College and Career Readiness Science 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 *West Virginia 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.

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 *West Virginia 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

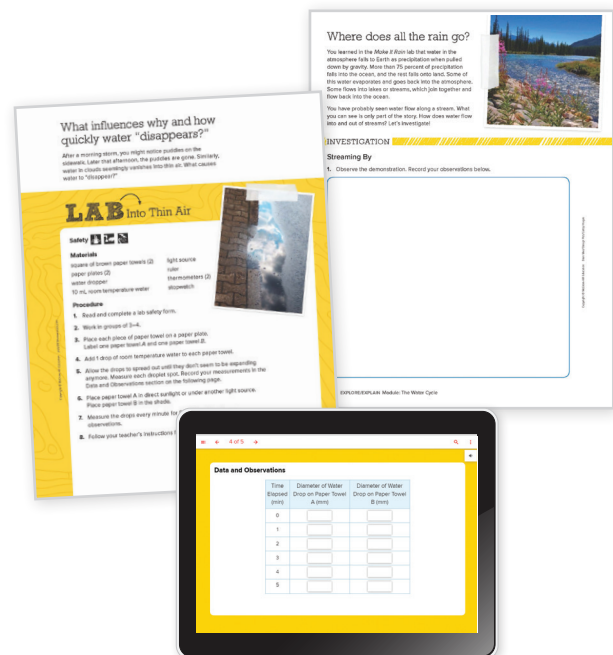
To make this a guided inquiry activity, have students plan their own investigation by selecting their own volumes and temperatures of water, making their predictions, and conducting their plan.

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.

Engaging Inquiry Activities with Options

Every lesson in *West Virginia 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.

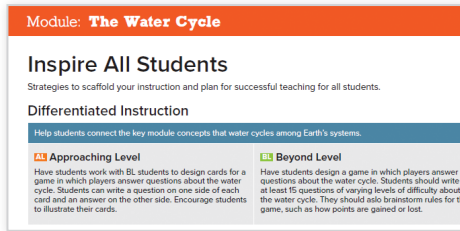


Ensure Equity

West Virginia 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

West Virginia 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.

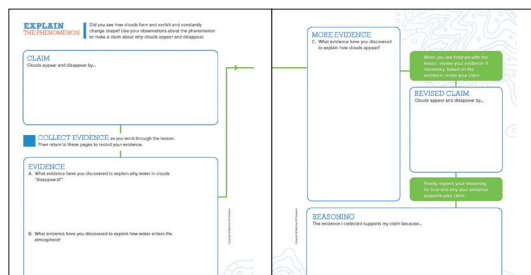


LEARNSMART®

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 *West Virginia 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, *West Virginia 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 study different ways water cycles, let's write 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.

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 the different ways water cycles in the module, add them to the word wall. Ask students to write definitions of the words, as well as explanations and examples, and examples using sentence frames such as: Precipitation is when _____. One example of this is ____.

BRIDGING
Concept Web As you study different concepts, have students create concept webs in their notebooks. For ways water cycle atmosphere, have a concept map. Have water cycles through as they come across module, such as co and examples: cloud students to work in their concept maps.

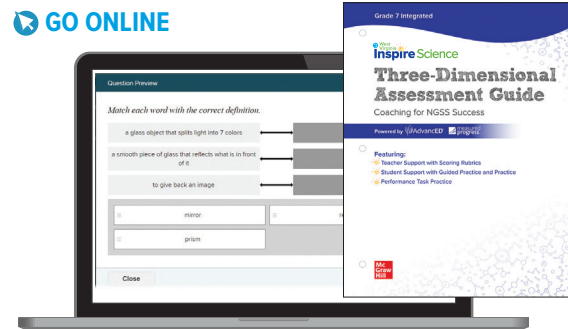
ELL Support
ELD P.L.E.T.C. Guide students in using a select number of academic and domain-specific words, as well as knowledge of affixes to discuss why clouds change.
EMERGING Demonstrate the meanings of *appear* and *disappear* with gestures and classroom realla. Support students in answering the first question with a sentence frame: Parts of the cloud seemed to ____ and ____.
EXPANDING Discuss the meanings of *appear* and *disappear* by explaining that *dis-* can give a verb the opposite meaning. 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*.

Additional English-language support is available in your online resources.

Assessment Strategies

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

Online Assessment Center



Designed to Fit Any Classroom

At McGraw Hill, we understand that different classrooms have different needs for tactile and digital resources. We know those needs can change day to day. *West Virginia 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.

Print Resources

Every *West Virginia 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 EDITION



STUDENT EDITION



Digital Resources

In addition to the digital versions of each print book, *West Virginia 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.



LESSON 2

Earth and Human Activity

People and the Environment

Before You Read

Key Concept
How does resource use affect the environment?

What do you think? Read the two statements below and decide if you agree or disagree with them. Place an A in the Agree column if you agree with the statement or a D in the Disagree column. After you read the lesson, return the statements to see if you have changed your mind.

Before	Statement	After
	Humans can have both positive and negative impacts on the environment.	
	Deforestation does not affect soil quality.	

Read to Learn

Why cut down trees?
Many scientists are concerned about the loss of forests around the world. The removal of large areas of forests for human purposes is called **deforestation**. Why do people cut down trees?

Urbanization increases in the human population cause increases in the use of natural resources. Humans cut down trees to make wood and paper products, such as your notebook. Trees are also cut for use as fuel. People also clear forests for urban development. **Sustainable** is the development of resources that do not deplete natural resources.

Agriculture The human population is growing fast. More land is needed to produce food for people. Clearing forests for farmland is one way to feed people. The Corn Belt in Brazil covers 2 million hectares of grassland and tropical forest. Today, it is being turned into high-productive cropland to grow soybeans. The rapid growth of soy production in Brazil has both positive and negative effects. More food is now available to feed the world. However, the clearing of forests can negatively affect Earth's systems.

6 Earth and Human Activity Reading Essentials
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How does deforestation impact Earth's systems?

North half of the deforestation of Earth's tropical forests occurs in the "arc of deforestation," an area in South America. The Amazon rain forest is the world's most diverse grassland. It has at least 10,000 plant and animal species. The Amazon rain forest is home to some 10 percent of Earth's total species. How does deforestation affect the biosphere and other Earth's systems?

Changes in Earth's Systems Clearing forests for cropland and pasture causes habitat loss. Habitat loss is a leading cause of extinction for plants and animals in the biosphere.

Deforestation can also affect the geosphere and hydrosphere. Plant roots hold soil in place. Without these natural anchors, soil erodes away. Drought can also follow deforestation. Cleared land dries rapidly and stores little moisture.

Deforestation also impacts the atmosphere. Trees remove carbon dioxide from the atmosphere during photosynthesis. Rates of photosynthesis decrease when large areas of trees are cut down, so more carbon dioxide remains in the atmosphere. Recall that carbon dioxide is a greenhouse gas that contributes to climate change.

What can be done?
Can Earth sustain our current lifestyle? Will there be enough natural resources for future generations? These questions are among the most important in environmental science today. The approach on Earth for food, water, energy, oxygen, and other materials that support life. We cannot consume resources faster than nature can replenish them. When the environment is harmed, everyone suffers. Therefore, scientists, governments, and concerned citizens around the world are working to identify environmental problems, educate the public about them, and help find solutions.

Call to Action Thanks to our supply of natural resources, we have advanced technology and action on national and international levels. However, effective action can begin with the individual.

Personal Choices The concept of an ecological footprint helps individuals measure their environmental impact on Earth.

Scientific Vocabulary
habitat (define) the natural home where a plant or animal lives

Scientific Vocabulary
extinction (define) when a particular species dies out

Scientific Vocabulary
erode (define) a period of dry weather with not enough water to fill surrounding gaps

Academic Vocabulary
replenish (define) to fill something again

Academic Vocabulary
impact (define) the effect of one thing on another

7 Earth and Human Activity Reading Essentials
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Clever, Google Classroom,
and more.



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