Science is everywhere. We live it, breathe it, and see it everyday in the world around us. But, it’s always been removed from the rest of the classroom curriculum, separate from the rest.

The print and digital update of *Interactive Science* will change all that. Research-based and developed for today’s students, the print and digital update of *Interactive Science* delivers best in class technology supported by problem-based, hands-on learning, engaging STEM activities, and interdisciplinary reading, writing, and math connections. Designed to support a transition to Next Generation Science Standards (NGSS) and other new standards, *Interactive Science* brings the fun back to class while building the skills students need to think like scientists and engineers.
Integrated, Interactive, and Inter-Connected

*Interactive Science* offers an engaging, hands-on learning experience for students and an easy-to-manage program for teachers. Carefully developed to support Next Generation Science Standards (NGSS), *Interactive Science* offers seven inter-connected program elements that come together to make science real, relevant, and fun for students and teachers alike.
Interactive Science provides support to ensure students learn science based on the NGSS framework.

Disciplinary Core Ideas (DCI)
Lessons address Disciplinary Core Ideas, key concepts required to meet the Performance Expectations.

Performance Expectations (PE)
The Teacher’s Edition describes detailed, focused opportunities for hands-on activities correlated to NGSS Performance Expectations.

English/Language Arts and Math Connections
Performance Expectation Activities can be extended to include additional activities and links to specific English/Language Arts and Math standards.
Lab activities integrated at the lesson and chapter level provide inquiry opportunities for students to use skills and knowledge simultaneously.

Crosscutting Concepts (CCC)
These larger themes, which link across grade levels and across disciplines within grade levels, are noted at the chapter level in the Teacher’s Edition.

Problem-Based Learning
New online Quests are problem-based learning activities that dive deep into real world topics and encourage students to apply what they have learned to new situations. These in-depth, 4-8 week projects include labs, digital simulations, prototype building, and communicating findings.

Science and Engineering Practices (SEP)
Every chapter opens with a STEM Activity that enables students to apply science and engineering skills to real-world problems.

The Apply It! activity is an open inquiry lab that gives students a chance to explore science using the Science and Engineering Practices.

Professional development boxes in the Teacher’s Edition provide background information and suggestions for teaching with the Science and Engineering Practices.
Natural Humidifier

Transpiration is the evaporation of water from plant leaves and stems. It is an important process for plants. As water evaporates from the leaves and stems, more water moves up the plant to all its parts, carrying with it new nutrients and minerals. It is also important in cooling the plant.

Certain factors affect how much water evaporates from plant leaves. When the temperature around the plant increases, more water evaporates. More water also evaporates on windy days. If there is a lot of water in the soil, more water will evaporate. Transpiration is one way moisture is added to the air. Humidity increases when water is added to the air.

A city garden center has hired you to design a transpiration meter to estimate how much water a plant releases into the air in one day.

Identify the Problem

1. What is your task? _________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

2. In what situation could this information be helpful? _________________________
   _______________________________________________________________________
   _______________________________________________________________________

Do Research

Look at a diagram of the water cycle.

3. What are the main sources of water vapor that contribute to humidity in the atmosphere? ________________________________________________________________
   _______________________________________________________________________

4. Which of these sources contributes more to the overall humidity? _____________
   _______________________________________________________________________

Directed Inquiry

Investigate It! activities include directed, guided, and open-inquiry options on a laminated Activity Card.
Simple, 30-Second Lab Activity Setup

No more prepping labs during lunch hour. Each activity comes in its own bag for quick, easy set up.

1. Get your trays and activity placemats.

2. Select the bag containing all your lab materials.

3. DONE!

Custom Lab Kits

Get students’ hands busy and their minds active with safe, easy-to-use lab materials. Materials for each unit come organized in activity bags for a class of 30 students to work in small groups. Each unit comes in a handy plastic bin.

“No-Clean-Up” Online Labs

Virtual labs, simulations, and animations make it easy to support hands-on inquiry. All lab sheets are fully downloadable and editable online.
STEM Connections

Is It Cold in Here?

Objectives
In this activity, students will design and build a simple draft detector.

1. Identify a problem that reflects a need.
2. Propose and test a solution to a problem.
3. Modify a design based on evaluation.
4. Use a metric ruler to measure to the nearest millimeter.

Materials
1 sheet each of several types of paper, such as tissue paper, wrapping tissue, tissue paper, construction paper, and tissue paper, scissors, adhesive strips, tape, pencils; if available, a hand fan, and a metric ruler.

Advance Preparation

1. If your schoolroom is especially airtight, you may need to test your device under different conditions. You may wish to run several trials with different types of pencils.
2. If a fan is used, try to control the strength of the breeze produced so that all of the detectors will be functioning under the same conditions. You may wish to run several trials with different fan “speeds” to identify which of the detectors work best.

Inquiry

A glacier is an aircraft that flies without an engine. Most gliders are towed into the air by a powered airplane. When the glider is released, the forces of thrust, drag, lift, and gravity act on the craft. Lift opposes gravity because air under the wings pushes the glider up. Like other aircraft, glider wings have a curved upper surface. Air moves faster over the wing than under it, causing the glider to rise. Air moving parallel to the airplane’s wings has lower pressure than non-moving air. The faster air moves, the lower the pressure. Higher pressure under the wing lifts the glider.

Drage, which is caused by friction between the glider and the air, slows the glider down. Glider pilots can keep these craft in the air for hours by riding thermals—rising columns of warm air—to provide additional lift throughout the flight.

You probably have made simple gliders before. Paper airplanes are gliders. Like gliders that carry people, a paper airplane’s design determines how long, how far, and the speed it can fly. To make a model of a fuel-efficient way to fly, an airline company has asked you to work in a group to build a paper glider, test it, and then modify its design for maximum flying time and distance.

Identify the Problem

1. What is your task? ____________________________
2. What problem will your device help to solve? ____________________________________________
3. Why might drafts be a problem? ____________________________________________
4. Why might some drafts be harder to detect than others? ____________________________
5. What happened to the paper? ____________________________________________
6. Why are the designs of the aircraft different? ____________________________________________
7. What are your design constraints? ____________________________________________
8. What is your design based on? ____________________________________________

How are the designs of the aircraft the same? ____________________________________________

How are the designs of the aircraft different? ____________________________________________

Go to the materials station(s). Pick up each material one at a time. Think about how it may or may not be useful in your design. Leave the materials where they are.

Background

Most of our energy today comes from fossil fuels, such as coal and oil. Production of fossil fuels and their extraction can harm the environment. For example, mining of coal and dripping for the extraction of oil can create water pollution. When fossil fuels are burned, some of their harmful substances add to air pollution. When air leaks into or out of a building, it can lose energy to heat or cool the building. By cutting back on the amount of energy used to heat or cool a building, people can reduce air pollution and save money on utility bills. Additional insulation can trap the heat and eliminate the need for more insulation. In addition to helping to conserve energy, these changes can be used to reduce air pollution and improve energy efficiency in homes and buildings.

Teach STEM Confidently.

You don’t need to be a science major. Interactive Science helps all teachers effectively introduce STEM concepts.

Connect to STEM in Every Chapter

Students use mathematical thinking, design thinking, experimenting, and modeling to solve problems.
Take Students on an Online STEMQuest

Drive problem-based learning and inquiry with hands-on STEMQuests.

- Problem-based learning
- Modeling to engage students in Science and Engineering Practices (SEP)
- Career and real-world connections
- Group projects that enhance collaborative skills
- Student debates to build communication skills
- NBC Learn Videos—engaging, timely, age appropriate
- Animations, simulations, and virtual labs
- Teacher support throughout
Connect to Reading and Writing

Target critical reading and writing skills directly in the Write-in Student Edition.
- Cause and Effect
- Communication Skills
- Compare and Contrast
- Draw Conclusions
- Infer
- Main Idea
- Predict

Vocabulary Smart Cards

Make science vocabulary stick with interactive games and practice throughout the day.

Teach literacy through science by integrating reading, writing, and comprehension skills.
Content Leveled Readers with ELL Support

Leveled Readers are a lesson plan in themselves. Foldout prompts and activities coach students at their reading level. The Teacher’s Edition includes guidelines for differentiating instruction.

• Below-Level
• On-Level
• Advanced
• Plus ELL support in each Leveled Reader!
What affects motion?

Lesson 1
What is motion?
Lesson 2
What is speed?

Motion

How can you measure motion?

Let's Glide Away!

Let's Glide Away!

How does friction affect motion?

Predict

These cyclists are riding on a circular racing track. This track has curves and banks so that the cyclists can move very quickly. What might affect the cyclists’ motion?

Record observations, ideas, and results. Students work in their own interactive Write-in Student Edition.

WRITE Here, WRITE Now.

ENGAGING QUESTIONS begin every chapter and help you capture students’ ideas about science concepts.

WRITING The pencil icons indicate interactive writing throughout the lesson.
Lesson 1

What is motion?

Draw the path that the bouncing ball takes.

Have you ever felt sick in a car, boat, train, or airplane? You may have had motion sickness. Some people think that motion sickness is a problem related to the stomach. However, motion sickness happens when a person’s sense of balance is thrown off. Balance is controlled by the inner ear. Sometimes the inner ear and the eyes process riding in something, such as a car or airplane, in different ways. This can cause a person to get pale, to get sweaty, or to vomit.

What do you think people with motion sickness could do to feel better?

What is motion?

All kinds of things around you move in different ways. Objects can move in a straight line, in a curved path, back and forth as a vibration, or as a rotation. You can describe and measure their motion in different ways. Motion is a change in the position of an object.

Look at the toy car and track in the picture to the right. First, the car moves in a straight path. Next, the car moves in curves around the track. Finally, the car moves back to the starting line.

1. **Sequence** Describe the sequence of events of the yellow race car as it travels around the track.

   - First
   - Next
   - Finally

2. **Identify** Of the types of motion discussed in this section, which types are not shown in the picture above?

Motion

Sometimes the cars move on a straight path on the track.
Connect to DIGITAL Learners.

All content, assessments, data, and management tools are at PearsonRealize.com. Realize your potential!

Heighten Interest, Increase Achievement
Engage your students with videos, animations, interactive lessons, PowerPoint® presentations, and interactive lessons. Teach 21st century skills for next generation learners!

Customize Your Curriculum
Edit program resources and assessments. Reorder content. Upload your own content and links. Regain valuable time with auto-graded assignments.

ADD RESOURCES! ENHANCED WITH GOORU!
Browse and Search with Ease
Search by keyword or Next Generation Science Standard. Find targeted resources by grade, media type, or content type.

Use Real-Time Data
Access student and class data that shows NGSS concept mastery, online activity, and progress. Know instantly if a student needs remediation. Perfect for parent-teacher conferences!
Meaningful Assessment

Assess for SUCCESS.

Interactive Science provides a variety of assessment tools to help teachers measure progress and adapt instruction.

Got it?

12. Classify A cedar tree is a vascular plant. It produces cones. What kind of plant is it?

Self-Assessment Checks
Throughout every lesson, students can evaluate their progress with the Got it? feature. If a student needs extra help they can log on to My Science Coach and get more practice.

Chapter Study Guides
At the end of every chapter, students review what they’ve learned and prepare for the test.

Chapter Review & Benchmark Practice
At the end of every chapter, students have the opportunity to review and take a benchmark practice test in a standardized test format.

ExamView® Assessment Suite
For every lesson, create and print tests in minutes from a bank of thousands of questions.

Got it?

Lesson 1
What are nonliving and living things?
• Nonliving things do not grow or change.
• Living things can grow and change.

Lesson 2
What do living things need?
• Plants need air, water, light, and nutrients.
• Animals need air, water, food, and shelter.

Lesson 3
How do plants and animals live in land environments?
• Forests, prairies, and deserts are land environments.

Lesson 4
How do plants and animals live in water environments?
• Wetlands and oceans are water environments.
Assess and Remediate
Online you can:
• Check with auto-graded Lesson Quizzes
• Provide targeted remediation with adaptive Chapter Tests
• Evaluate progress with Unit Tests and an End-of-Year Test.

Track Standards Mastery and Coverage
Instantly access student and class data that shows NGSS mastery on assessments, online activity, and overall progress.

Dig Deeper
Click to reveal more detailed information about student mastery, progress, and usage.
Developed by a team of science educators and experts, Interactive Science is based on solid scientific research that’s classroom tested and proven effective.

Proven Results
Students showed a statistically significant improvement from pre- to post-testing after using the Interactive Science program. Students improved their performance as measured by multiple choice, fill in the blank, and constructed response items.

Chapter Test Pre- and Post-Test Results

*This study and all statistical analyses and conclusions were performed by PRES

To view a summary of the results of this pilot study, please visit InteractiveScience.com

21 percentile points!
Students experienced significant learning gains while using Interactive Science: t(139) = 8.34, p < .0001. The Cohen’s d statistic (0.56) indicated a medium effect size, which translates to the average student’s score increasing by 21 percentile points as a result of using the program.

“If you have your own book, and you can take it home at the end of the year, you can still have all of the stuff to look at. You can look back next year to see how much you remember.”

—Elementary School Student
Meet Our INSPIRING Author Team

TECHNOLOGY
DON BUCKLEY, M.Sc.
Don Buckley has been at the forefront of K–12 educational technology for nearly two decades. A founder of New York City Independent School Technologists (NYCIST) and long-time chair of New York Association of Independent Schools’ annual IT conference, he has taught students on two continents and created multimedia and Internet-based instructional systems for schools worldwide.

Curriculum
ZIPPORAH MILLER, M.A.Ed.
Zipporah Miller is a former K–12 science supervisor and STEM coordinator for the Prince George’s County Public School District in Maryland. She is a science education consultant who has overseen curriculum development and staff training for more than 150 district science coordinators.

Inquiry and Life Science
MICHAEL J. PADILLA, Ph.D.
A former middle school teacher and a leader in middle school science education, Michael Padilla has served as president of the National Science Teachers Association and as a writer of the National Science Education Standards. He is professor of science education at Clemson University. As lead author of the Prentice Hall Science Explorer series, Dr. Padilla has inspired the team in developing a program that promotes student inquiry and meets the needs of today’s students.

Physical Science
KATHRYN THORNTON, Ph.D.
Selected by NASA in May 1984, Dr. Kathryn Thornton is a veteran of four space flights. She has logged over 975 hours in space, including more than 21 hours of extravehicular activity. As an author on the Scott Foresman Science series, Dr. Thornton’s enthusiasm for science has inspired teachers around the globe.

Earth Science
MICHAEL E. WYSESESSION, Ph.D.
An author on more than 50 scientific publications, Michael Wysession was awarded the prestigious Packard Foundation Fellowship and Presidential Faculty Fellowship for his research in geophysics. Dr. Wysession is an expert on Earth’s inner structure and has mapped various regions of Earth using seismic tomography. He is known internationally for his work in geoscience education and outreach.

Understanding by Design
GRANT WIGGINS, Ed.D.
Grant Wiggins is coauthor of Understanding by Design® (UbD), a philosophy of instructional design. UbD is a disciplined way of thinking about curriculum design, assessment, and instruction that moves teaching from covering the content to ensuring understanding. Dr. Wiggins is one of today’s most influential educational reformers and consults with schools, districts, and state education departments.

ELL Consultant
JIM CUMMINS, Ph.D.
Dr. Cummins’s research focuses on literacy development in multilingual schools and the role of technology in promoting student learning across the curriculum. The Interactive Science program incorporates essential research-based principles for integrating language with the teaching of academic content based on Dr. Cummins’s instructional framework.

Reading Consultant
KAREN L. OSTLUND, Ph.D.
Dr. Ostlund has over 40 years of experience teaching at the elementary, middle school, and university levels. She was Director of WINGS Online (Welcoming Interns and Novices with Guidance and Support) and the Director of the UTeach/Dell Center for New Teacher Success with the UTeach program in the College of Natural Sciences at the University of Texas at Austin. She also served as Director of the Center for Science Education at the University of Texas at Arlington, as President of the Council of Elementary Science International, and as a member of the Board of Directors of the National Science Teachers Association. As an author of Scott Foresman Science, Dr. Ostlund was instrumental in developing inquiry activities.