


NATIONAL GEOGRAPHIC
Science

CORE
K-5



Start the Experience

 NATIONAL
GEOGRAPHIC
LEARNING

 CENGAGE



Promote science success as you share
The National Geographic Experience

- Immerse Students in the Nature of Science and Inquiry
- Unlock the Big Ideas in Science for All Learners
- Build Scientific and Content Literacy



Program Authors



Randy Bell, Ph.D.
Associate Professor of Science Education, Oregon State University



Malcolm Butler, Ph.D.
Professor of Science Education, University of Central Florida



Kathy Cabe Trundle, Ph.D.
STEM Education Department Head and Professor, North Carolina State University



Nell Duke, Ed.D.
Co-Director of the Literacy Achievement Research Center, Professor of Teacher Education and Educational Psychology, University of Michigan



Judith Lederman, Ph.D.
Director of Teacher Education, Illinois Institute of Technology



David W. Moore, Ph.D.
Professor of Education, Arizona State University

Built for Your Classroom

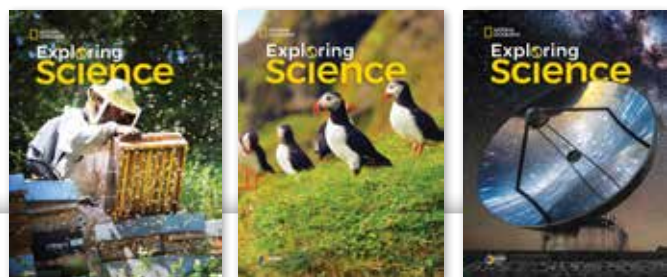
Modular Life, Earth, and Physical Science units at the primary grades allow you to engage K–2 students in a wealth of active discovery and shared exploration through the use of Big Books and little books in English and Spanish. The program then grows with your students by transitioning to grade-level sets of Life, Earth, and Physical Science Student Books at grades 3–5. At every grade, **myNGconnect** gives students and teachers online access to the books and digital program resources.



Modular unit-based Classroom Sets at Grades K–2



Life, Earth, and Physical Science Student Books at each Grade 3–5



Exploring Science, Grades K–5

Enhance Next Generation Science Standards (NGSS) instruction with the **Exploring Science** program.

Complete and Flexible



Integrated Print and Technology with Hands-On Inquiry

Designed to Take Students Beyond

Students join leading National Geographic Scientists and Explorers in the field via special video segments launching each unit and at various points throughout the program. These valuable interactions provide students with real-life models of how scientists conduct studies and gain scientific knowledge, and provide an excellent opportunity to address STEM topics in the classroom.



Constance Adams
National Geographic Emerging Explorer, Space Architect



Stephon Alexander, Ph.D.
National Geographic Emerging Explorer, Theoretical Physicist



Thomas Taha Rassam Culhane
National Geographic Emerging Explorer, Urban Planner



Luke Dollar, Ph.D.
National Geographic Emerging Explorer, Conservation Scientist



Marianne Dyson
Science Writer and Former NASA Flight Controller,



Maria Fadiman, Ph.D.
National Geographic Emerging Explorer, Ethnobotanist



Beverly Goodman, Ph.D.
National Geographic Emerging Explorer, Geo-Archaeologist



Madhulika Guhathakurta, Ph.D.
NASA Astrophysicist



Albert Yu-Min Lin, Ph.D.
National Geographic Grantee, Archaeologist



Greg Marshall
National Geographic Filmmaker, Marine Biologist, Conservationist, Inventor



Mireya Mayor, Ph.D.
National Geographic Emerging Explorer, Primatologist, Conservationist



Ainissa Ramirez, Ph.D.
Physicist



Tim Samaras
National Geographic Emerging Explorer, Severe-Storms Researcher



Tierney Thys, Ph.D.
National Geographic Emerging Explorer, Marine Biologist, Filmmaker



Katey Walter, Ph.D.
National Geographic Emerging Explorer, Aquatic Ecologist, Biogeochemist

Connections to Real Scientists!



Revealing the Nature of Science

In *National Geographic Science*, process skills build at each grade level to ensure a complete understanding of the Nature of Science. Throughout the program, process skills and the Nature of Science work together to help students think and act like scientists.



Modeling Real Scientists in the Field

	Kindergarten	Grades 1 & 2	Grade 3	Grade 4	Grade 5
PROCESS SKILLS	OBSERVE	OBSERVE & INFER	CLASSIFY	PREDICT/HYPOTHESIZE	DESIGN EXPERIMENTS
Nature of Science	<ul style="list-style-type: none"> Science knowledge is based on evidence. Science knowledge can change based on new evidence. 	<ul style="list-style-type: none"> Science conclusions are based on observation and inference. Science theories are based partly on things that cannot be observed. 	<ul style="list-style-type: none"> There is often no single "right" answer in science. 	<ul style="list-style-type: none"> Scientific theories provide the base upon which predictions and hypotheses are built. 	<ul style="list-style-type: none"> There is no single, scientific method that all scientists follow. There are a number of ways to conduct the practice of science.

Think Like a Scientist

How Scientists Work

Solving Problems Together

Many prairies once grew in Illinois. Now farms, roads, and cities cover the land. Most prairies are gone. Many animals that depend on prairie plants cannot survive.

Some scientists want to save more prairie habitats in Illinois. These scientists are collecting seeds to grow new prairie plants. They search for the best places to collect seeds and where to plant them. They tell other scientists what they find out.

Change in Illinois Prairies

- Prairies, 1820
- Prairies, 2009

Think Like a Scientist

Science and Technology

How Technology Helps Scientists

Technology helps scientists to discover new information and to make people's lives better. Modern telescopes, digital computers, and electronic microscopes allow scientists to make better observations and measurements than in the past.

Telescopes An optical telescope is a system of lenses or mirrors that collects light from distant objects. Telescopes allow observers to see fainter, more distant objects than they can see with only their eyes. Scientists today use telescopes to investigate the age of the universe, observe the life cycles of stars, and look for planets outside our solar system. Telescopes help scientists learn more about space.

Digital Computers Scientists use digital computers to collect and store data, make calculations, and create models. Since the middle of the twentieth century, digital computers have been changing our world. They contribute to saving lives with medical equipment, navigating jet planes, and forecasting weather. Computers allow us to use email, the Internet, and television. Banks, stores, and hospitals depend on computers that store and share data. Video games and movies are produced with the help of computers. Tiny computers are in appliances, watches, phones, and toys. Digital computers affect many things in our work and play.

The Keck telescopes allow astronomers to see two colliding galaxies nearly 5 billion light-years away.

Each of the twin Keck telescopes has a 10-meter system of mirrors. They are the world's largest optical telescopes.

This ENIAC (Electronic Numerical Integrator and Computer) from the 1940s was the first electronic digital computer in the United States. It filled a 9-by-18-meter room. A laptop computer today is more powerful than ENIAC was.



Address STEM Through Leveled, Hands-On Inquiry

National Geographic Science provides students with abundant and relevant hands-on practices to facilitate a thorough understanding of key science concepts. The four levels of inquiry in the program are designed to help students build confidence and competence in scientific thought and inquiry.

Explore Activity

The *Explore Activity* builds background for the unit and actively **engages** students as they **explore**.

Guided Inquiry

Explore Activity

Investigate Habitats

Question Which plants and animals live on land and which live in water?

Science Process Vocabulary

observe verb
When you **observe**, you use your senses to learn about an object or event.

compare verb
When you **compare**, you look at 2 or more things and see if they are the same or different.

What to Do

1. Unfold your sorting circles.
2. Make 2 habitat cards. Write **water** on 1 card and **land** on the other.

Directed Inquiry

In *Directed Inquiry*, the teacher gives direct instruction throughout the activity. Students are given opportunities to **explain** what they have done, **elaborate** by asking further questions, and **evaluate** by answering questions and using a self-reflection rubric.

Directed Inquiry

Investigate How Desert Plants Survive

Question How can the waxy covering of a leaf help a plant survive in a dry desert?

Science Process Vocabulary

model noun
You can make a **model** to show how something works.

predict verb
When you **predict**, you tell what you think will happen.

What to Do

1. Draw two leaf shapes. Cut out the leaf shapes. These are **models** of leaves.
2. Spray both leaf models with the same amount of water.

Also Included

Science in a **Snap!**

offers quick investigations to activate understanding of science concepts.



Science Inquiry Kits provide all the materials required to complete inquiry activities.

Guided Inquiry

In *Guided Inquiry*, students become independent learners with guidance from the teacher. Students may manipulate variables, provide **explanations**, **elaborate** by asking further questions, and **evaluate** by answering questions and using a self-reflection rubric.

Guided Inquiry

Investigate Erosion

Question How does the way water moves on soil affect the way the soil moves?

Science Process Vocabulary

variable noun
A **variable** is a part of an experiment that you can change.

What to Do

1. Put on your safety goggles. Label the plastic containers 1, 2, and 3. Put one paper cupful of soil at one end of each of the containers. Put a wood block under the same end of the container as the soil. You will not pour any water into container 1.
2. Use the paper clip to poke two small holes in the bottom of the plastic foam cup.

Open Inquiry

In *Open Inquiry*, students choose their own questions, design and carry out their own plans, collect and record their own data, look for patterns, and communicate that data. Students **explain** their results, **elaborate** by asking further questions, and **evaluate** by answering questions and using a self-reflection rubric.

Open Inquiry

Do Your Own Investigation

Question Choose one of these questions, or make up one of your own to do your investigation.

Science Process Vocabulary

hypothesis noun
When you make a **hypothesis**, you state a possible answer to a question that can be tested by an experiment.

Open Inquiry Checklist

- Choose a **question** or make up one of your own.
- Gather the materials you will use.
- If needed, make a **hypothesis** or a **prediction**.
- If needed, identify, manipulate, and control **variables**.
- Make a **plan** for your investigation.
- Carry out your **plan**.
- Collect and record **data**. **Analyze** your data.
- Explain and **share** your results.
- Tell what you **conclude**.
- Think of another question.

e Inquiry eHelp

online inquiry support for teachers at [myNGconnect](https://myNGconnect.org).



Exploring Standards In Depth

At every level, *National Geographic Science* is targeted and focused on the Big Ideas in Science, inviting students to question, engage, actively explore, and understand core science concepts in English or Spanish.



Big Idea Questions

- Where do plants and animals live?
- What do plants and animals need to survive?
- How do plants and animals depend on each other?

At grades K–2, each unit is centered on three chapter **“Big Ideas”** that target instruction to core science topics.

Moving through the unit, students delve deeper into understanding the chapter **Big Ideas** through collaborative and independent work.

Contents

Introduction: Our Planet 4

Chapter 1

Where Do Plants and Animals Live? 6

Water Habitats 8

Land Habitats 10

A Forest Habitat 12

Chapter 2

What Do Plants and Animals Need to Survive? 16

Survival 18

Chapter 3

How Do Plants and Animals Depend on Each Other? 24

Animals Need Plants 26

Plants Need Animals 32

Conclusion: Life on Planet Earth 36

Glossary 38

Index 40

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At grades 3–5, each chapter presents a **“Big Idea”** that focuses instruction on core science topics.

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Providing Access to Content

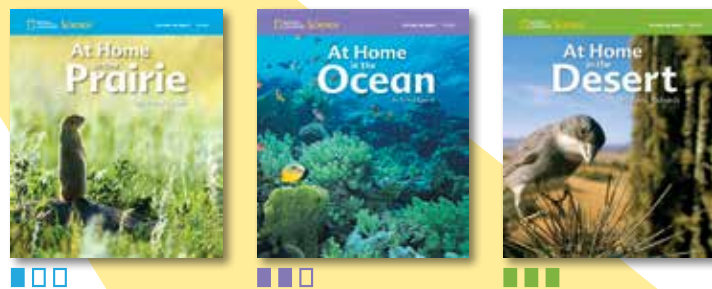
National Geographic Science is designed to engage all learners in exploring and understanding the Big Ideas of Science. Focused instruction with built-in support helps you reach students of varying ability levels.



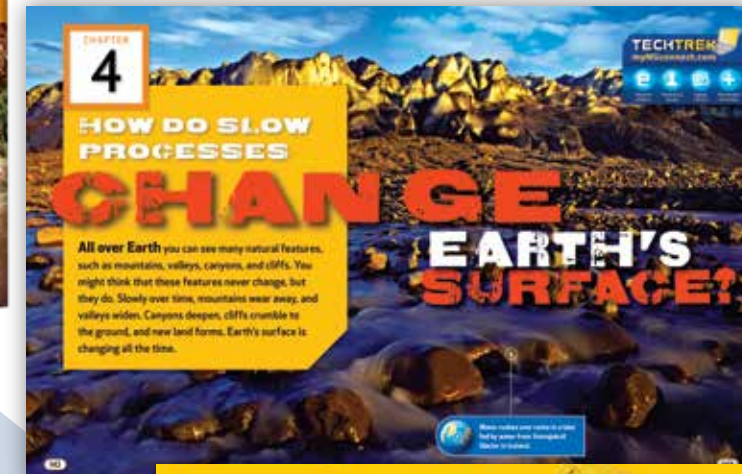
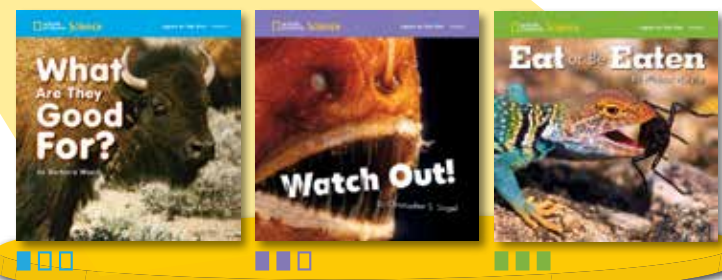
Online Interactives



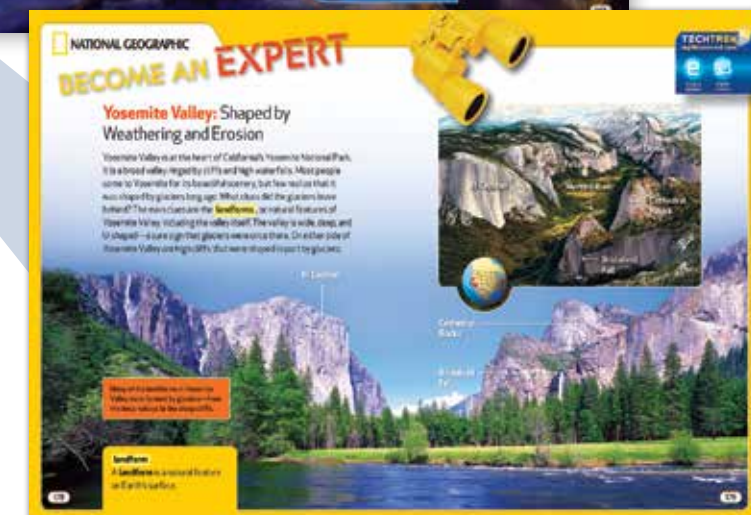
Become An Expert books for grades K–2 tie directly to the unit's Big Ideas and are presented at three reading levels, enabling teachers to effectively differentiate instruction.



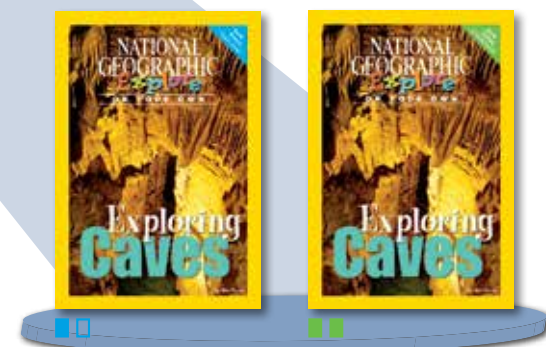
Leveled **Explore On Your Own** books carry forward the topical exploration at grades K–2, offering the flexibility to either extend learning in Science, or to provide connected nonfiction reading in your Language Arts block.



In the **Become An Expert** section of each chapter in grades 3–5, students apply what they've learned through concrete examples found throughout our world.



Pioneer and Pathfinder editions of the **Explore On Your Own** books for grade 3–5 provide the same content at two different reading levels, encouraging all students to read independently.



Instilling a Legacy of Scientific Literacy

Real-life models of National Geographic Explorers and scientists in the field help students to develop scientific literacy and better understand the Nature of Science.



Students learn that Science is:

- A way of knowing
- Empirically based and consistent with evidence
- Subject to change when new evidence presents itself
- A creative process



Collect and Record Data

Scientists want to find an answer to their questions. They collect and record **data**. Data are observations and measurements scientists gather in an investigation or experiment.

The tools and probes Tim leaves in the tornado's path take measurements of how the weather changes.

The probes have cameras that record the actual tornado. This data, or information, helps Tim answer his questions.

Tim has chased over 250 tornadoes. But every storm is different. Sometimes Tim doesn't put the probes in the exact path of the tornado. Sometimes the tornado doesn't touch down at all.

Look for Patterns

Scientists try to repeat their experiments or investigations more than once. They look for patterns in the data.

Make Conclusions

After finishing a plan and analyzing data, a scientist tries to reach a **conclusion**. A conclusion may be an answer to a question or a solution to a problem. Sometimes scientists don't reach conclusions. Instead, they may come up with more questions.

"In order to make our work effective, we have to figure out why things worked and what we would need to do in order to replicate the work in other environments," says Colburn.

Through his work, T.H. has concluded that it is important to provide all people with the knowledge of how to access basic human needs, like clean water and food. This knowledge is vital to a more peaceful and eco-friendly world.

Share Results

Scientists **share** their results with other people. They want others to learn what they find out.

T.H.'s work has allowed entire cities to change for the better. When families learn how to live a more sustainable lifestyle, they share their knowledge with others. T.H. moves on to other areas in need of his help.

"I work with my team to take our work around the world to conferences and classrooms and homes and offices and cities. We will never be taking our work to share our results in my pants," says Colburn.

Supporting Literacy Through Science

National Geographic Science also builds literacy skills to help students succeed across content areas.

Reading Comprehension

Teacher Edition support at K–2 includes opportunities to work with four comprehension strategies to ensure content learning is deep and lasting.

- Preview and Predict
- Monitor and Fix Up
- Make Inferences
- Sum Up

At Grades 3–5, these four strategies are used to reinforce content learning.

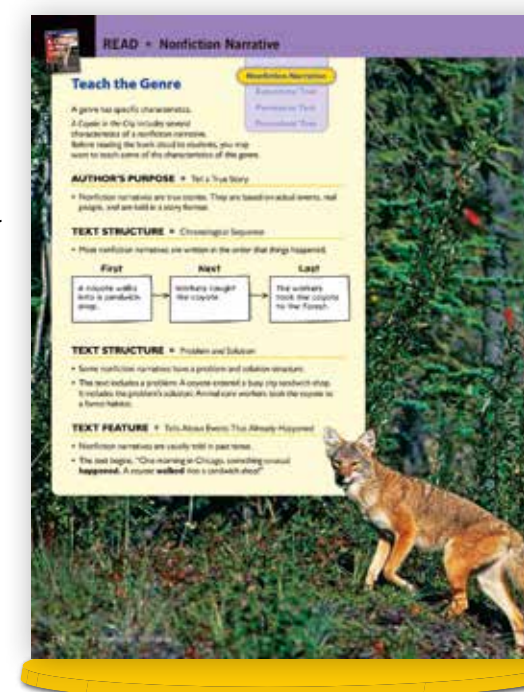


Expository Writing

Instruction at K–2 includes ample opportunity for students to express their understanding in four modes of scientific writing.

- Nonfiction Narrative
- Expository Nonfiction
- Procedural Text
- Persuasive Text

At Grades 3–5, students are given opportunities to write like a scientist by practicing procedural writing in the Science Inquiry and Writing Book.





Integrated Technology

myNGconnect for Students

The Student Home Page provides easy access to an array of technology tools designed to support and enhance the student's learning.

Spanish components available as eBooks



myNGconnect for Teachers

The Teacher Home Page provides the ability to easily find and manage program technology resources and provides online access to the full array of student and teacher materials.



Student eEditions

- **Big Ideas, Student Inquiry Books, Become an Expert,** and **Explore On Your Own** books available online
- Highlighting, note-taking and search tools built-in, along with Read-to-Me audio support.



NG Digital Library

- Access to videos, images and simulations
- Easy-to-use search and topic-specific media packages.



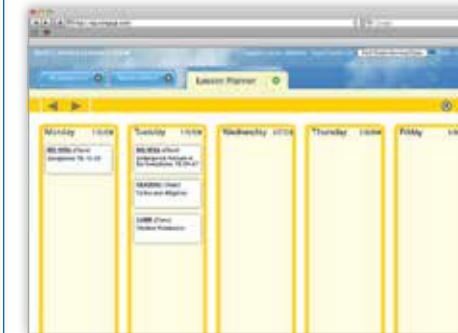
Vocabulary Games

- Highly-interactive student games with rewards to teach vocabulary from units at K–2 and chapters at 3–5.



Enrichment Activities

- Interactive resources to expand science concepts presented in the units.



Online Lesson Planner

- Tailor instruction to the amount of time you have each day
- Plan group and independent work
- Print plans at-a-glance or in detail.



Online Professional Development

- Resources to enhance lesson delivery and encourage best practices.



Teacher eEdition

- Online edition with embedded links to Unit Launch Videos, Assessment Handbook, and Learning Masters.



Classroom Presentation Tool

- Allows teachers to project all print materials and visuals for a lesson.



Kindergarten Units

Life Science	Earth Science	Physical Science

Grades 1–2 Modular Units

Life Science	Earth Science	Physical Science

Life, Earth, and Physical Science for Grades 3–5

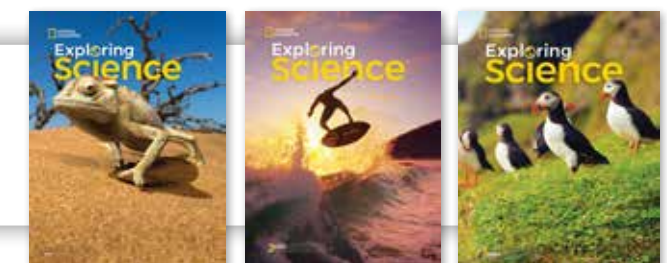
Grade 3	Grade 4	Grade 5

Program Components

	Kindergarten	Grades 1–2	Grade 3	Grade 4	Grade 5
Big Ideas Big Books	■ ■	■ ■			
Big Ideas Student Books		■ ■	■ ■	■ ■	■ ■
Science Inquiry Big Books	■ ■				
Science Inquiry Student Books		■ ■			
Science Inquiry and Writing Student Books			■ ■	■ ■	■ ■
Become An Expert Books	■	■			
Explore On Your Own Books	■	■	■	■	■
Teacher's Editions	■ ■	■ ■	■ ■	■ ■	■ ■
Big Ideas & Vocabulary Cards	■	■			
Write About Big Books	■ ■	■ ■			
Learning Masters	■	■	■	■	■
Assessment Handbook	■	■	■	■	■
ExamView® CD-ROM		■	■	■	■
Science Methods and Process Skills Big Book and Teacher's Guide	■	■	■	■	■
Science Inquiry Kits	■	■	■	■	■
Science Inquiry Safety Kits	■	■	■	■	■
Science Inquiry Kit Consumables Refill	■	■	■	■	■
myNGconnect Technology	■	■	■	■	■
eBooks	■	■	■	■	■

■ English ■ Spanish available

Enhance NGSS lessons with the **Exploring Science** program.



Promote science success as you share ***The National Geographic Experience***

- Immerse Students in the Nature of Science and Inquiry
- Unlock the Big Ideas in Science for All Learners
- Build Scientific and Content Literacy
- Available in Spanish
- Address STEM Inquiry



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