

NORTH CAROLINA

# Science

Focus on Essential Standards and Clarifying Objectives

Review North Carolina Science digitally at our  
Adoption Review site: [myngconnect.com](https://myngconnect.com).

Click "For Educators" and enter:  
Adoption.review@ncarolina.com  
Password: Learning

# NORTH CAROLINA Science

Focus on Essential Standards and Clarifying Objectives

## *The Exploration Begins At Home*

NATIONAL GEOGRAPHIC  
LEARNING BRINGS SCIENCE  
HOME TO NORTH CAROLINA

- Connect students to standards with familiar images and local content
- Focus on the Essential Standards and Clarifying Objectives
- Reach all learners through engaging content, inquiry, and literacy

MEET 100% OF NORTH CAROLINA K-5 SCIENCE STANDARDS WITH TWO PACKAGE OPTIONS:

Pages 8-9

### **Science Literacy Package**

Build science success through literacy

- Enhance science comprehension and literacy skills through content reading
- Engage all students through differentiation at 3 reading levels

Pages 10-13

### **Science Package**

Immerse students in the nature of science and inquiry

- Improve science understanding through project-based inquiry activities
- Increase engagement with online videos and simulations



## DESIGNED TO TAKE STUDENTS BEYOND

In both North Carolina Science package options, students join leading National Geographic Explorers and Scientists in the field at various points throughout the program. These valuable interactions provide students with career connections and deliver real-life models of how scientists conduct studies and gain scientific knowledge.

### Address STEM with National Geographic Explorers



**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



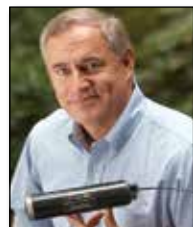
**Beverly Goodman, Ph.D.**  
National Geographic Emerging Explorer,  
Geo-Archaeologist



**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



**Anissa Ramirez, Ph.D.**  
Physicist



**Tim Samaras**  
National Geographic Emerging Explorer,  
Severe-Storms Researcher



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



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



Make Global Connections!

## CONNECT STUDENTS TO STANDARDS WITH FAMILIAR IMAGES AND LOCAL CONTENT

### What Can You Observe?

Look at the forest.  
Describe what you can see.  
Tell what you might hear.  
Share what you might **observe** with others.

**Did You Know?**  
There are more than 120 kinds of trees in North Carolina!

Triple Falls, Brevard, North Carolina

**Wrap It Up!**  
Observe an object in your classroom.  
Tell about how the object might change.

### Aquatic Ecosystems

Aquatic ecosystems have environments that are completely or partly under water. Some examples are ponds, lakes, the ocean, estuaries, and salt marshes.

Flat, muddy **salt marshes** are found in low-lying coastal areas along the ocean. During high tide, the ocean slowly rises up and floods the land, usually twice a day. At low tide, the water recedes, leaving the land wet with salt water. Most of the plants that live in salt marshes are grasses. Many plants cannot tolerate such salty conditions, so the plants that live in salt marshes are not found in many other places. People used to believe these environments were "wastelands" and destroyed them, but salt marshes are very important ecosystems. People are now working to protect and restore salt marshes.

**Estuaries** are another kind of saltwater ecosystem. An estuary is formed where a river meets the ocean. The river water and ocean water mix together. Estuaries are salty, but not as salty as the ocean. Unlike salt marshes, estuaries are always covered with water. Some species of fish that live in estuaries can survive in fresh water and in salt water.

**LAKES AND PONDS** Nearly all lakes and ponds contain fresh water, and often have a river or stream flowing in and out of them. Numerous species of fish, plants, and amphibians such as frogs live in lakes and ponds. Many terrestrial animals come to ponds in search of food and water. Lakes and ponds are important to people, too. Cities and towns are often built near lakes, which are a source of water for crops and drinking water.

**THE OCEAN** Earth's largest body of water contains many different ecosystems. Algae and many species of fish and other water-breathing animals live in the ocean. Some air-breathing animals, such as whales, also live in the ocean. For the most part, the ocean is deep, dark, and cold. But along the coasts in shallow waters you can find coral reefs. Reefs are extremely colorful, and home to thousands upon thousands of different species.

The salt marshes on Bodie Island are flooded with ocean salt water twice a day.

**Wrap It Up!**

- List** Name two ecosystems where the water is salty and two where the water is fresh.
- Recall** What kinds of producers can be found in aquatic ecosystems?
- Explain** What is high tide, and how does it affect areas near the ocean?

Grade 5, Bodie Island shows salt marsh and estuary ecosystems

Grade K, Triple Falls in Brevard, NC is shown during an observation lesson

# FOCUS ON NORTH CAROLINA ESSENTIAL STANDARDS AND CLARIFYING OBJECTIVES

Both North Carolina Science package options master 100% of the Essential Standards for grades K–5.

## Living Things in the Blue Ridge Mountains

The Blue Ridge Mountains is a mountain region in western North Carolina. Many plants and animals live in the Blue Ridge Mountains. The American black bear eats both plants and animals. Many plants and animals depend on this mountain environment for survival.

American black bears can be found all over North America, including North Carolina. This American black bear gets fish and water from the mountain stream.

**Wrap It Up!**

1. What does the American black bear eat?
2. Research an animal that lives in the Blue Ridge Mountains. Tell how it depends on another animal or a plant.

**Essential Standard 1.L.1** Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive.  
**Clarifying Objective 1.L.1.2** Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.

### Essential Standard 1.L.1 Clarifying Objective 1.L.1.2

Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.

## Integrate Math and Science with project-based Investigations

### Investigate Earth's Water

How does the amount of water in four of Earth's main water features compare?

Most of Earth's surface is covered by water. This water is located or stored in four main water features. These are oceans, ice caps, groundwater, and surface water, such as rivers and lakes. In this activity you will use data to make a graph comparing the amount of water found in these four places.

**Materials**  
graph paper

Water Feature	Approximate Percentage of Total Water on Earth
oceans	97%
ice caps and glaciers	2.4%
groundwater	0.4%
surface water (lakes, rivers, streams, and ponds)	< 0.1%

**Sample Circle Graph**  
In a circle graph, the complete circle represents the total amount, or 100%. The size of each slice represents a percentage of the total.

**Sample Bar Graph**  
In a bar graph, each category gets a separate bar. The height of each bar indicates the amount.

**1 Examine the data.** What is the largest source of water? What is the smallest? Think about how you will show all the values on the chart accurately. Then use the descriptions below to help you decide which type of graph you will use to represent your data.

**2 Make your graph.** Be sure to include a title and clear labels. Check to be sure that your graph represents the data accurately.

**3 Share your graph with a classmate.** Revise your graph based on feedback.

**Wrap It Up!**

1. **Describe** Use evidence from your graph to describe the distribution of salt water and fresh water on Earth.
2. **Contrast** Use your graph to describe the amount of groundwater and the amount of water that is frozen in ice caps. Which feature contains more water? Use evidence from your graph to support your answer.
3. **Apply** In many parts of the world there is not enough water in rivers and lakes to supply people's need for fresh water. What are some other sources of fresh water that people could use?

**Essential Standard 3.E.2** Compare the structures of the Earth's surface using models.  
**Clarifying Objective 3.E.2.1** Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).

### Data and math Inquiry activity for Essential Standard 3.E.2

#### Clarifying Objective 3.E.2.1

Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).

## Daily Weather Patterns

You may notice some changes throughout the day. In the morning the sun's light starts warming the land, air, and water. When the sun goes down it feels cool again.

Some daily weather patterns only happen in one region. In Florida, there are often rain showers in the afternoon. In parts of California, mornings can be foggy while afternoons are clear.

Carolina beachgoers may need warmer clothes as the air cools down in the evening.

In the middle of the day, Carolina beachgoers enjoy the warm air and water.

**Wrap It Up!**

1. What part of the day is warmest?
2. Name two daily weather patterns where you live.

**Essential Standard 2.E.1** Understand patterns of weather and factors that affect weather.  
**Clarifying Objective 2.E.1.3** Compare weather patterns that occur over time and relate observable patterns to time of day and time of year.

### Essential Standard 2.E.1 Clarifying Objective 2.E.1.3

Compare weather patterns that occur over time and relate observable patterns to time of day and time of year.

## Friction

If you want to slow down or come to a stop on a bicycle, you apply the breaks and create friction. **Friction** is a contact force that can make moving objects slow down or stay in place. When you stand on a sloped surface such as a ramp or hill, friction between your shoes and the ground keeps you in place. But if the same surface is covered in ice, hold on! There won't be enough friction to keep you from sliding downward.

Race cars are designed to reduce friction in some ways and increase it in others. The body of a race car has smooth surfaces and rounded corners. These features reduce the friction caused by air resistance at high speeds.

The tires on a race car, however, are designed to increase friction. Each car uses wide tires that have a smooth rubber surface. This maximizes contact with the track. As long as the track is dry, smooth tires increase the amount of friction, giving drivers more control and speed.

**Did You Know?**  
The Charlotte Motor Speedway in Concord is home to a 600-mile race that takes 400 laps to complete. The first such race was held at the Speedway in 1960. It took those drivers more than five-and-a-half hours to finish. Today's fastest drivers can finish the race in just over four hours.

The wheels of this race car are spinning faster than the car is moving. Friction between the track and tires heats the tires.

**Wrap It Up!**

1. **Define** What is friction?
2. **Apply** Give one way in which friction is useful and one way in which it is not useful when riding a bike.
3. **Infer** Explain what would be different about this photo if the racetrack was covered with slick oil.

**Essential Standard 5.P.1** Understand force, motion and the relationship between them.  
**Clarifying Objective 5.P.1.1** Explain how factors such as gravity, friction, and change in mass affect the motion of objects.

### Charlotte Motor Speedway used as an example of friction in Clarifying Objective 5.P.1.1

Explain how factors such as gravity, friction, and change in mass affect the motion of objects.

# Two Package Options: Components Overview Comparison



## OPTION 1:

### North Carolina Science Literacy Package includes:

- Science Content Books
- Write About Big Books
- Teacher Resources

### Plus:

- Leveled Science Readers

## OPTION 2:

### North Carolina Science Package includes:

- Science Content Books
- Write About Big Books
- Teacher Resources

### Plus:

- Inquiry Books
- myNGconnect Digital Access (6-year license)
- Science Methods and Process Skills Big Books

Grade K	OPTION 1 North Carolina Science Literacy Package	OPTION 2 North Carolina Science Package
North Carolina Science Student Book	•	•
North Carolina Science Teacher's Guide	•	•
Big Ideas Big Books (Life, Earth, Physical)	•	•
Write About Big Books	•	•
Science Inquiry Big Books		•
Become An Expert Books	•	
Explore On Your Own Books	•	
Teacher's Editions	•	•
Big Ideas & Vocabulary Cards		•
Learning Masters		•
Assessment Handbook		•
Science Methods and Process Skills Big Book and Teacher's Guide		•
myNGconnect Digital Access (6-year license)		•

Grades 1-2	OPTION 1 North Carolina Science Literacy Package	OPTION 2 North Carolina Science Package
North Carolina Science Student Book	•	•
North Carolina Science Teacher's Guide	•	•
Big Ideas Big Books (Life, Earth, Physical)	•	•
Write About Big Books	•	•
Big Ideas Student Books (Life, Earth, Physical)		•
Science Inquiry Student Books		•
Become An Expert Books	•	
Explore On Your Own Books	•	
Teacher's Editions	•	•
Big Ideas & Vocabulary Cards		•
Learning Masters		•
Assessment Handbook		•
ExamView CD-ROM		•
Science Methods and Process Skills Big Book and Teacher's Guide		•
myNGconnect Digital Access (6-year license)		•

Grades 3-5	OPTION 1 North Carolina Science Literacy Package	OPTION 2 North Carolina Science Package
North Carolina Science Student Book	•	•
North Carolina Science Teacher's Guide	•	•
Big Ideas Student Book Life Science		•
Big Ideas Student Book Earth Science		•
Big Ideas Student Book Physical Science		•
Science Inquiry & Writing Book		•
National Geographic Ladders Science	•	
National Geographic Ladders Readers	•	
National Geographic Ladders Readers Teacher's Guide	•	
Teacher's Editions		•
Learning Masters		•
Assessment Handbook		•
ExamView CD-ROM		•
Science Methods and Process Skills Big Book and Teacher's Guide		•
myNGconnect Digital Access (6-year license)		•

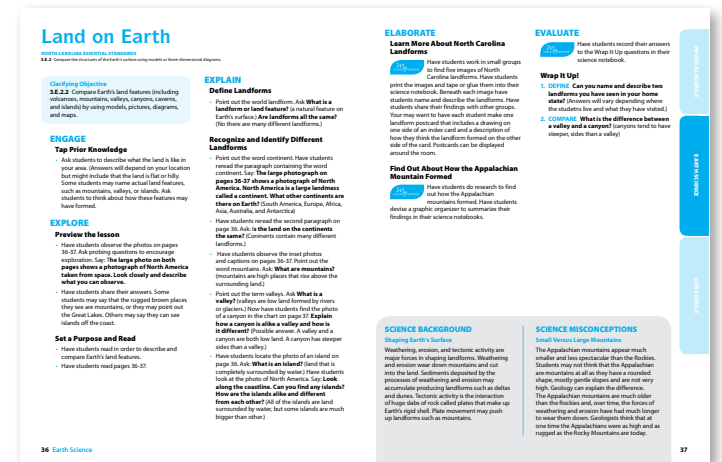
# NORTH CAROLINA SCIENCE LITERACY PACKAGE

The Science Literacy Package offers a unique combination of science content for North Carolina standards and leveled science readers to improve reading and writing skills.

- Differentiate science content with three levels of readers
- Engage students with hands-on science investigations
- Enhance reading comprehension and expository writing skills
- Balance science and reading classroom time with informational texts

## Teachers Support

Teacher's Guides for each grade provide the support needed to implement and assess the standards. Lessons focus on science content knowledge with additional emphasis on reading comprehension and extending writing skills in various genres.



## Grades K–2 Science Literacy

Content texts are supported by leveled science readers and science writing books for each grade.

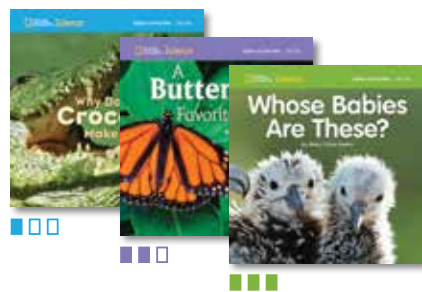


## Grades 3–5 Science Literacy

Content texts are supported by leveled science readers with three levels per reader for each grade.



**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.



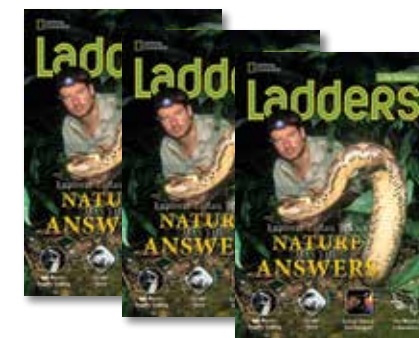
**Leveled Explore On Your Own** books carry forward the topical exploration at grades K–2, offering the flexibility to either extend learning in Science, or to provide connected nonfiction reading in your Language Arts block.



**Write About Big Books** are models for scientific writing to four different nonfiction genres.



**National Geographic Ladders Science** readers contain high interest content that explore life science, earth science, physical science, and STEM topics at three reading levels. The STEM titles inspire students through stories of National Geographic Explorers.



# NORTH CAROLINA SCIENCE PACKAGE

The Science Package includes standards-based science content along with integrated hands-on inquiry and enhanced myNGconnect technology focused on science investigation and exploration.

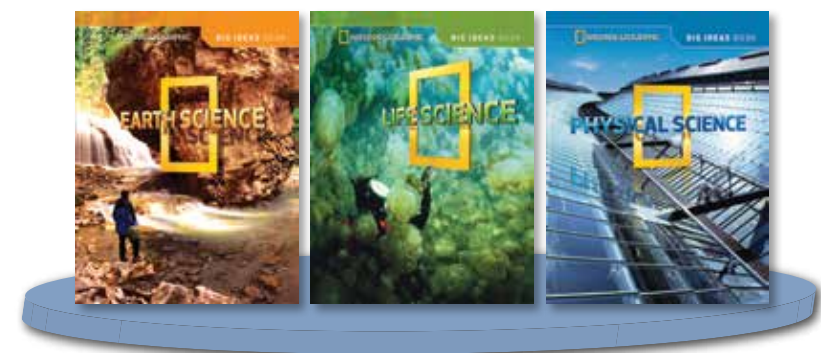
- Provide background and in-depth focus on the North Carolina Essential Standards
- Multiple levels of hands-on inquiry and active science investigations
- Increase engagement through our CODiE award winning digital platform, myNGconnect

## 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

Complete and Flexible



Integrated Print and Technology with Hands-On Inquiry

## Address STEM Through Problem-Based, Hands-On Inquiry

North Carolina Science provides students with abundant and relevant hands-on practices to facilitate a thorough understanding of key science concepts. The four gradual release 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**.

### Directed Inquiry

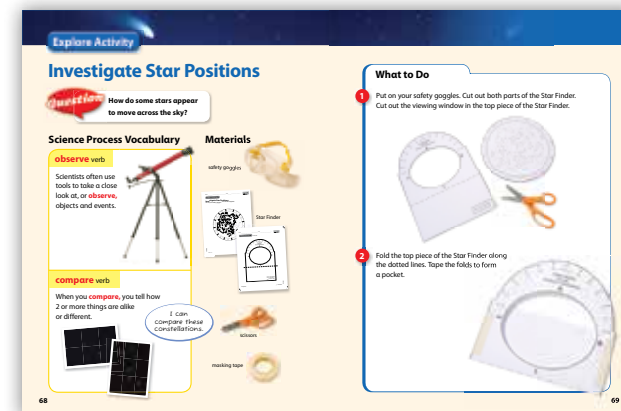
In *Directed Inquiry*, the teacher gives direct instruction throughout the activity. Students are given opportunities to **explain** what they have done, **elaborate** by asking further questions, and **evaluate** by answering questions and using a self-reflection rubric.

### 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.

### 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.



Explore Activity: Investigate Star Positions



Guided Inquiry: Investigate Erosion



Directed Inquiry: Investigate How Desert Plants Survive



Open Inquiry: Do Your Own Investigation

# NORTH CAROLINA SCIENCE PACKAGE

## 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



#### 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



#### Videos, Simulations, and Digital Library

- Videos featuring National Geographic Explorers and scientists introduce each unit
- Simulations allow student to manipulate variables for different results
- Searchable library of supporting video clips and images



#### 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

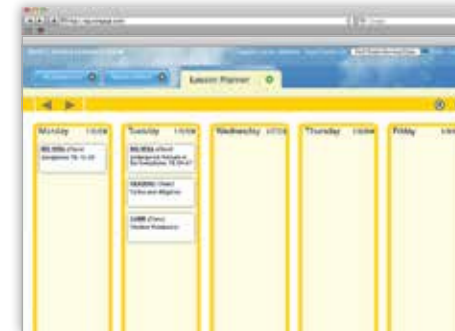


## Teacher's Guides

Teacher's Guides for each grade provide the support needed to implement and assess the standards. Master the Essential Standards and Clarifying Objectives with lessons that are based on the 5E model of Engage, Explore, Explain, Elaborate, and Evaluate.

### 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.



#### 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



# NORTH CAROLINA Science

Focus on Essential Standards and Clarifying Objectives

TWO PACKAGE OPTIONS FOR GRADES K-5:

## North Carolina Science Literacy Package

Build science success  
through literacy

## North Carolina Science Package

Immerse students in the nature  
of science and inquiry

Review North Carolina  
Science digitally at our  
Adoption Review site.

[myngconnect.com](http://myngconnect.com)

Click "**For Educators**" and use the following login information:

School-Issued Email Address:

**Adoption.review@ncarolina.com**

Password:

**Learning**

Contact your sales consultant  
for more information:

**Kate Norton**

[kate.norton@cengage.com](mailto:kate.norton@cengage.com)

704-241-3119



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888-915-3276

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