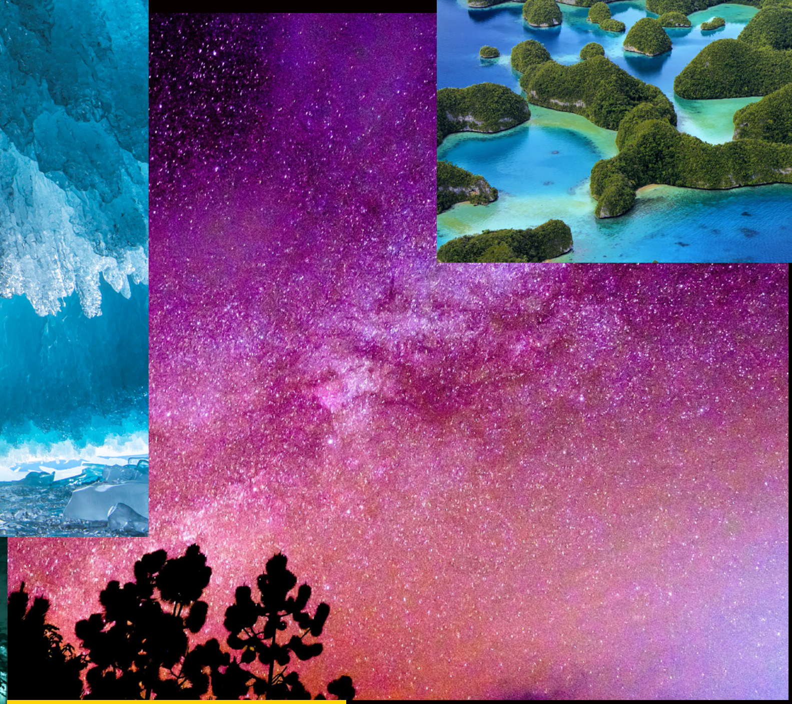
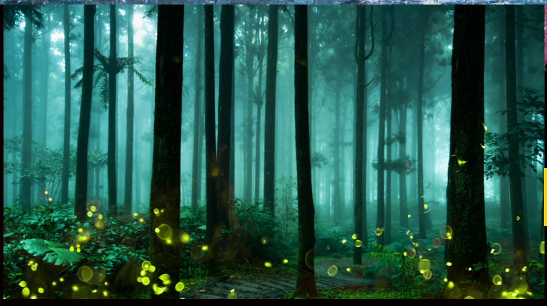
NATIONAL GEOGRAPHIC

Florida Grades 9-12

EARTH + SPACE SCIENCE

Florida Edition





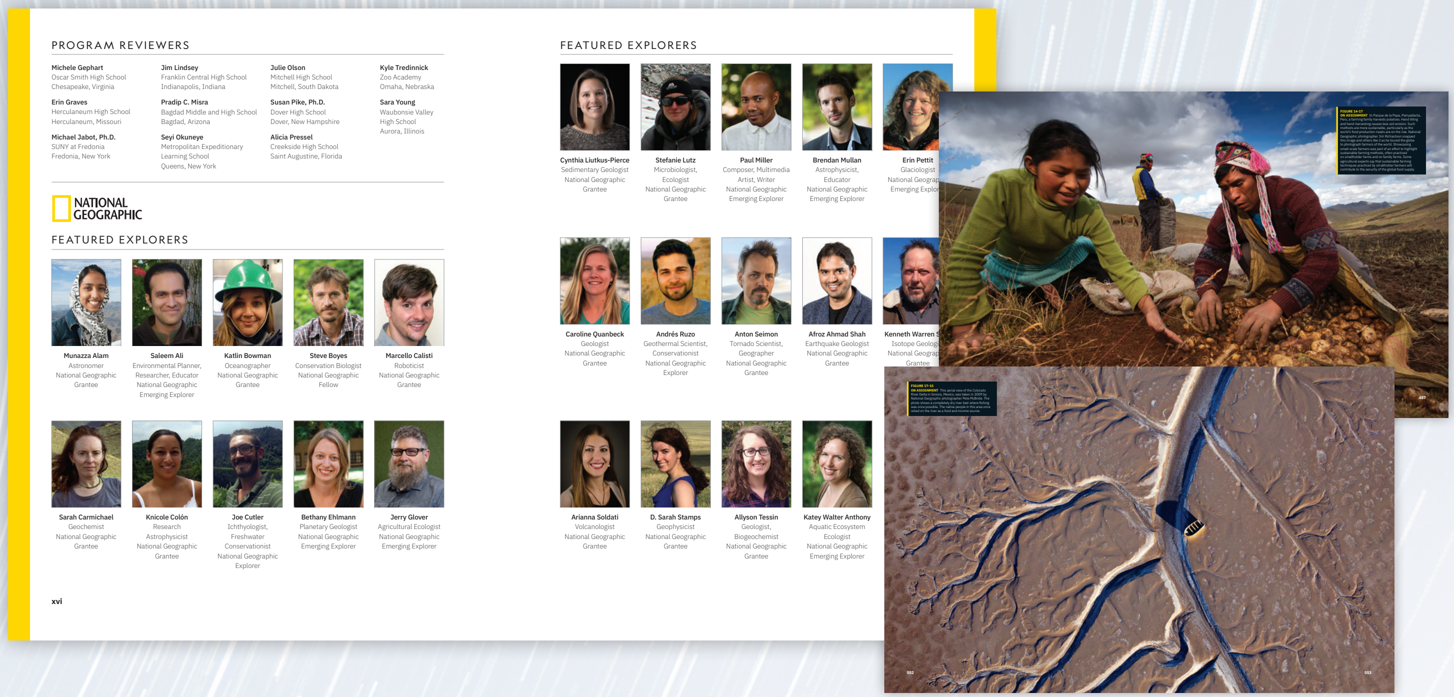
PRESENT EARTH SCIENCE AT THE CORE OF HIGH SCHOOL SCIENCE PRACTICES

Earth Science concepts are at the center of all sciences and ***National Geographic Earth and Space Science, Florida Edition*** shows students the importance of these connections to chemistry, biology, and physical science. Storytelling and stunning visuals tell how the balance of systems and the dynamics of the Earth are critical for sustainability.

Inspire students with images and videos from the National Geographic archives and build the earth science story with features of National Geographic Explorers.

Authentic National Geographic Experiences

National Geographic Earth and Space Science, Florida Edition delivers real-world connections through the stories of National Geographic Explorers who share their diverse perspectives and scientific practices as they solve earth science problems. National Geographic images and illustrations provide a full picture of the earth science story.



Engage Students with Earth and Space Science Stories

Introduce phenomena to students through the stories and real-world experiences of National Geographic Explorers.

Case Studies for each chapter introduce a real-world earth science story. Each is paired with a *Tying It All Together* activity at the end of the chapter where students explain the phenomenon behind the case study.

ENSURE EARTH SCIENCE STANDARDS ARE TAUGHT AS INTENDED

Lesson Design

ENGAGE

- Explorers At Work
- Explorer Video Series
- On Assignment Photo Lessons
- 3D Lesson Design
- Real World Issues & Phenomena
- Student-Generated Questions

EXPLORE/EXPLAIN

- Chapter Case Study
- Lesson Activities
- Video Library

ELABORATE

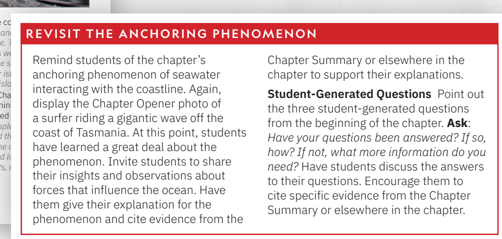
- Data Analysis Activities
- Tying It All Together
- Hands-On Labs
- Chapter Investigations

EVALUATE

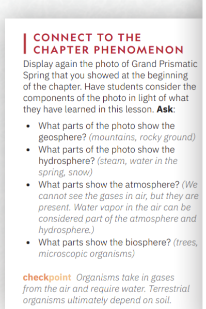
- Lesson Checkpoints
- Formative Assessments
- Summative Assessments
- Chapter Performance Tasks

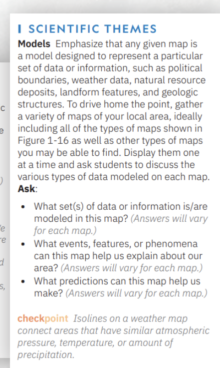
Earth and Space Science, Florida Edition is designed with 3-Dimensional lessons that are based on a phenomenon introduced in each chapter. These teaching strategies help students prepare for 3D assessments including the Next Generation Sunshine State Standards for Science.

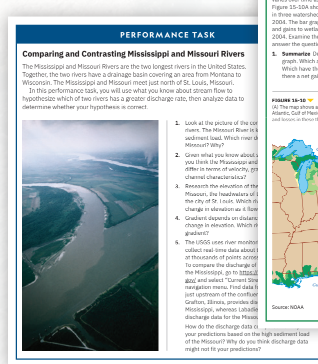
The Teacher's Edition provides support for introducing a phenomenon for each chapter, connecting to the phenomenon throughout the chapter, and revisiting it at the end of each chapter.

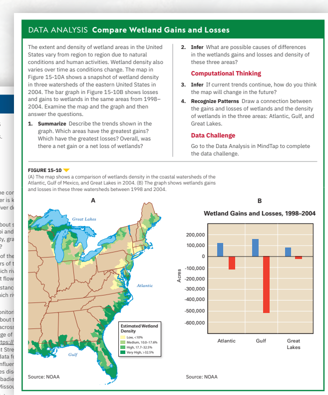


Lessons in the Teacher's Edition include 3-Dimensional support for the Florida Next Generation Sunshine State Standards.









Hands-on activities including Minilabs and Data Analysis activities that prepare students for the end of chapter Performance Task.

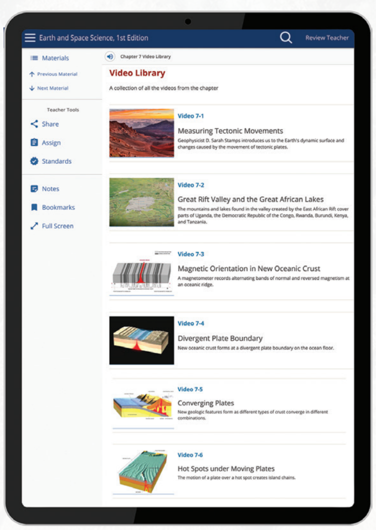
ALIGNED TO THE NGSSS

DIGITAL RESOURCES ENHANCE THE EARTH SCIENCE STORY

A series of videos featuring National Geographic Explorers builds upon the story and phenomenon in each chapter. These exclusive videos provide key content and vocabulary, while also inspiring students with stories of Explorers and their methods for solving problems.

Video Library and eBook Resources

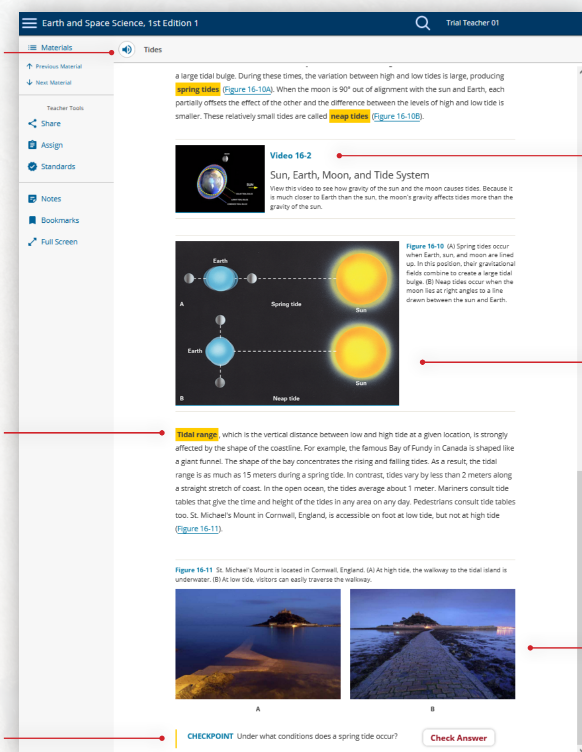
All videos are compiled into an easily accessible library for each chapter.



ReadSpeaker reads text aloud at varying speeds and voices

Interactive vocabulary with pop up definitions

Embedded assessment checkpoint questions with instant student feedback



Video links embedded at point of use for easy viewing

Clickable figures and images for larger viewing with zoom feature

PREPARE STUDENTS FOR COLLEGE AND CAREER

Skills introduced in *Earth and Space Science, Florida Edition* cultivate problem-solving and critical thinking that is needed for success in college and careers. Students make claims using evidence to build communication and group-work skills needed beyond high school. National Geographic Explorer features provide insight into science careers.

CROSS-CURRICULAR CONNECTIONS

There are many opportunities for students to connect the concepts they explore in this chapter to other disciplines. Here are a few examples.

- **Mathematics** After students learn about methods for measuring earthquake activity in Lesson 8.1, ask them to research the quantity of energy released that correlates to each moment magnitude. Have students graph energy versus moment magnitude value and discuss the exponential relationship between these two.
- **English Language Arts** Have students read Chapter 6 of Jules Verne's *Journey to the Center of the Earth*. This science fiction novel was written in 1864, long before tectonic plate theory was developed. Lead a class discussion in which students compare and contrast ideas mentioned in the chapter about the center of Earth with current thinking about Earth's interior as described in Lesson 8.4.

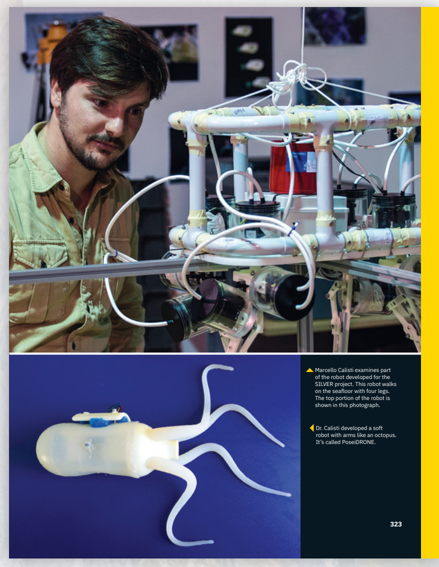
CAREER CONNECTIONS

Lead a discussion in which students identify other careers that are connected in some way to the Explorer's work or field of study. If students need prompting, select one of the careers below. Ask students what they know about the career and how it relates to the Explorer's work.

- **Oceanographer** Oceanographers study various properties of ocean ecosystems: chemical, physical, ecological, and geological, often specializing in one of these areas. In the Arctic, oceanographers might examine ocean currents, wind patterns, ocean nutrients, annual climate patterns, and many other factors.
- **Information Technology (IT) Specialist** IT specialists are responsible for managing computer systems. Major scientific investigations such as those exploring climate change often generate vast amounts of data used to develop computer models. The success of these models relies on the expertise of IT specialists who monitor software and hardware technology.

Connect Earth Science lessons to careers in a wide variety of science and non-science fields, and to many other high school disciplines.

Students meet dozens of National Geographic Explorers as inspiring figures for careers in science.



▲ Marcello Calisti examines part of the robot developed for the SILVER project. This robot walks on the seafloor with four legs. The top portion of the robot is shown in this photograph.

◀ Dr. Calisti developed a soft robot with arms like an octopus. It's called PoseiDRONE.

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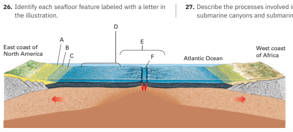
26. Identify each seafloor feature labeled with a letter in the illustration.

27. Describe the processes involved in the formation of submarine canyons and submarine fans.



Think Critically

Write a response to each question on a separate sheet of paper. Use concepts from the chapter to support your reasoning.

28. In 2012, scientist Conel Alexander analyzed the chemical composition of comets in our solar system and found that it differs from that of rocks on Earth that formed from ancient bolides. Does this evidence support or weaken any current hypotheses about the source of Earth's water? Explain.

29. Sampling and remote sensing tools such as the rock dredge and the echo sounder are not useful for exploring the deepest parts of the seafloor. Explain why you think these tools are not suited to deep-sea exploration. Then identify any technological innovations that are being used or could be developed in the future that could advance deep-sea exploration.

30. Is the rock on volcanic islands more similar to the rock on the seafloor or the rock on the continents? Explain your reasoning.

31. Dams can be placed on rivers in order to divert water to do useful work, such as generating electricity and irrigating fields. How do you think the construction of a dam would affect the evolution of submarine canyons and fans downstream of the rivers? Explain your reasoning.

PERFORMANCE TASK

Seafloor Features Model

In this chapter, you have learned about the origin of Earth's ocean basins, the sampling and remote sensing techniques that oceanographers use to study and map the seafloor, and the major types of geologic features of the seafloor.

In this performance task, you will work with a partner to create a slideshow or a stop-motion animation video to share what you have learned with the class.

1. Review the different seafloor features you learned about in Lessons 11.3 and 11.4. With a partner, choose one of these features to model.

A. Using your textbook and other resources, research how this seafloor feature changes over time. Make sure to document how it forms, what variables are required for its formation, how it changes over time, and what factors cause these changes. Consider factors such as tectonic forces, volcanism, weathering, and erosion.

B. Create a slideshow or stop-motion animation video to model how the feature evolves over time. You may draw pictorial models or use clay to form physical models of the feature. In your model, demonstrate how the feature develops and changes. Accompanying your slideshow or animation, include text to explain how it is affected by the environment.

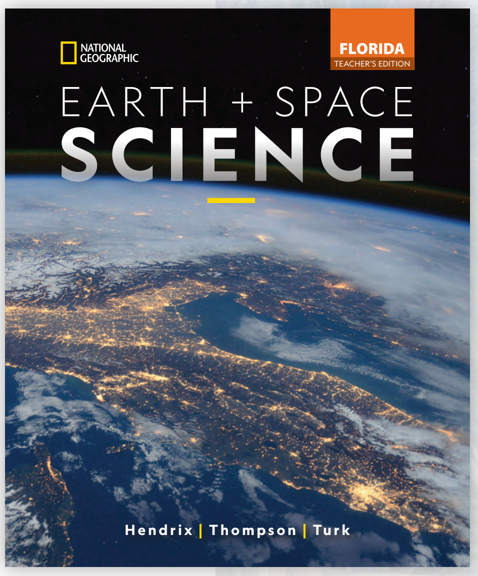
CHAPTER 11 ASSESSMENT 351

Critical Thinking exercises appear throughout the chapter and with each Explorer feature to extend student knowledge.

Students practice problem-solving skills during hands-on projects and Performance Tasks.

COURSE SUPPORT AND TEACHING TOOLS

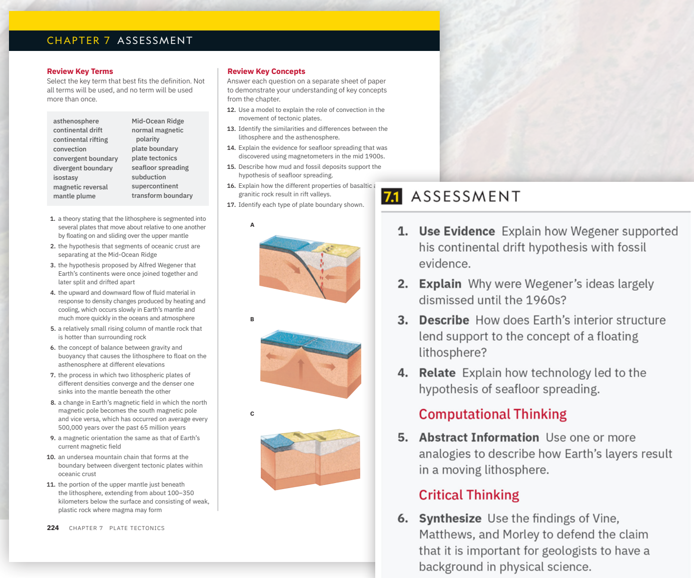
The print and digital resources guide teachers through Unit and Chapter planning to prepare students for 3-Dimensional skills, practices, and Performance Expectations including lessons built on the 5E model, phenomena, and differentiated instruction to meet the needs of all students.



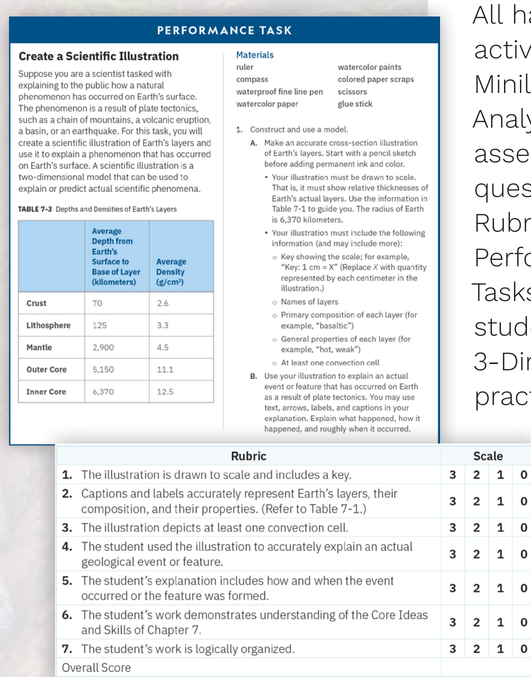
Additional downloadable resources include lecture slides, chapter summaries in English and Spanish, and assessments including chapter pre- and post-tests and the Cognero customizable assessment generator.

The Teacher's Edition includes support for reaching all students including English Language Learners, Students with Disabilities, Gifted and Talented, Girls, and others.

Assessment in a Variety of Formats

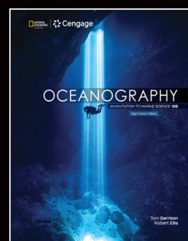


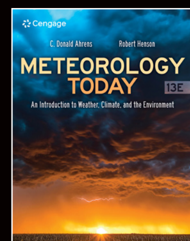
Each chapter section includes formative assessment increasing in Depth of Knowledge while end of chapter assessments review key terms and concepts (available in print and digitally).



All hands-on activities from Minilabs to Data Analysis include assessment questions while Rubrics for all Performance Tasks measure student 3-Dimensional practices.

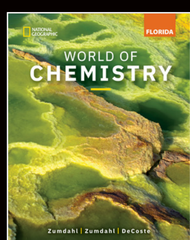
Visit **NGL.Cengage.com/FL-Science** to learn more.

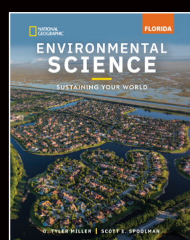


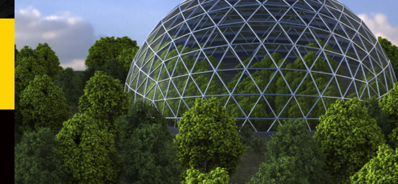


National Geographic Earth and Space Science, Florida Edition is one of several solutions available for earth and space-related courses. Extend student learning with these additional options.

Get the power of National Geographic for all your core and on-level science needs. See our other high school solutions for a true National Geographic experience.







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