

# Program Introduction

## Broward County Hands-On Science

**D**elta Education has a thirty-year tradition of commitment to quality, hands-on science education. The **Broward County Hands-On Science** program is designed to successfully engage students in inquiry-based learning. These comprehensive kits are user-friendly for all teachers, meeting the needs of both those who are at ease teaching science and those who appreciate more support.

The **Broward County Hands-On Science** kits include a selection of *Delta Science Readers* for students. These 16-page nonfiction books offer opportunities for reading in the different content areas. Together with the hands-on activities, *Delta Science Readers* create a powerful combination of science and reading.

### PROGRAM COMPONENTS

Each **Broward County Hands-On Science** kit includes

- ▶ a Teacher's Guide.
- ▶ a selection of *Delta Science Readers*\* (8 copies).
- ▶ materials and equipment for 32 students.

\*Additional copies of Readers may be purchased separately. Big Books are also available for K-1.

# ABOUT THE TEACHER'S GUIDE

Friendly, supportive, and flexible: that's the teacher's guide for the **Broward County Hands-On Science** program. All the science background and key points for guiding the hands-on activities are provided. Teacher pages for the *Delta Science Reader* give page-by-page discussion questions, opportunities for inquiry, and tips for reading in the content area. The table of contents lists other helpful resources.

**Objectives** focus of the activity and student goals

**Schedule** time to allow for the activity

**Vocabulary** new words introduced in the activity

**Materials** items used in the activity; quantity needed for each student, team, or the class

**Preparation** step-by-step instructions for what you need to prepare prior to class

**Background Information** science information related to the activity

**Additional Information** sample answers for discussion questions; tips for facilitating the activity; safety reminders as appropriate

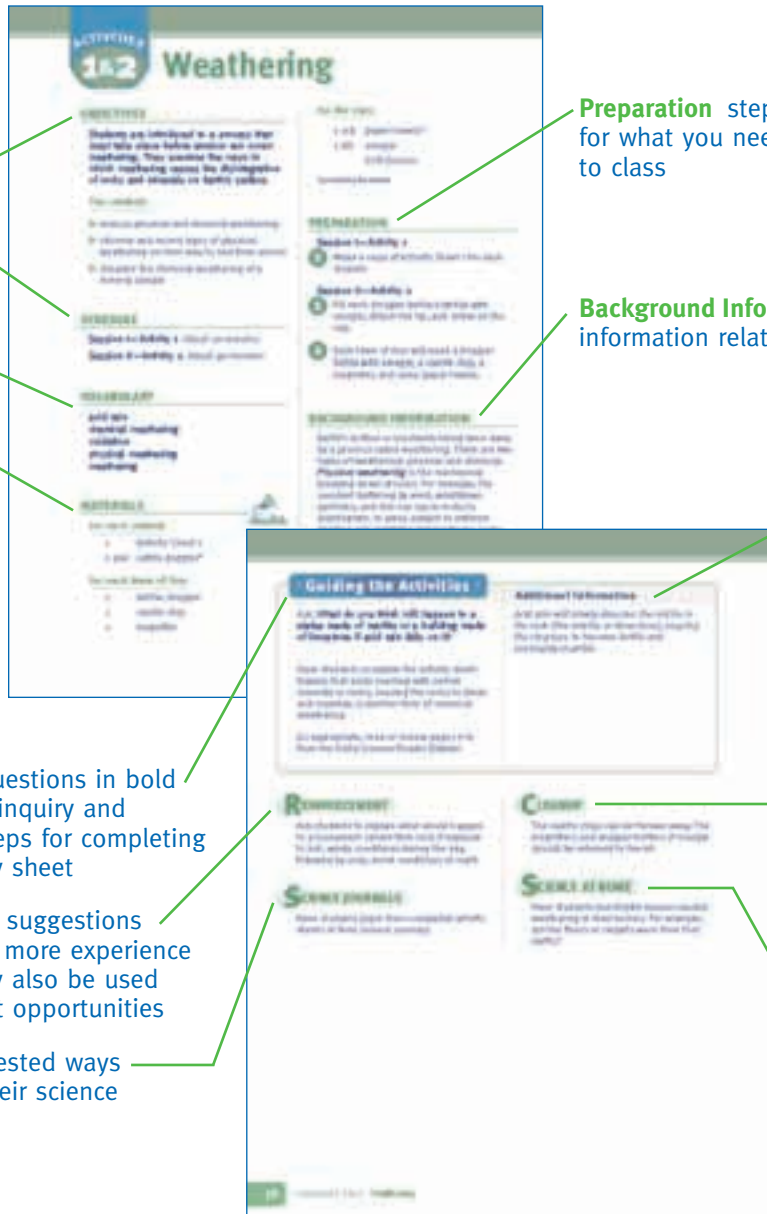
**Cleanup** materials management instructions to facilitate cleanup and return of materials to the kit

**Science at Home** follow-up activities that students can do at home

**Guiding the Activity** questions in bold type to use in leading inquiry and discussions; how-to steps for completing the activity and activity sheet

**Reinforcement** activity suggestions for students who need more experience with the concepts; may also be used as ongoing assessment opportunities

**Science Journals** suggested ways students can add to their science journals or portfolios



**Connections**

**Science Extensions**

1. In the introduction that introduces the article, the author states that the study of the connections between the mind and the body is a relatively new field of research. The author also states that the study of the connections between the mind and the body is a relatively new field of research. The author also states that the study of the connections between the mind and the body is a relatively new field of research.

**Science and Health**

1. In addition to reading the article, students should read the article "The Mind-Body Connection" by Dr. David Spiegel. This article discusses the connections between the mind and the body and how they affect each other.

**Science and Language Arts**

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**Science and Social Studies**

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**Connections** Ways to integrate activities and ideas for further discussion or research are provided at the end of each activity. Cross-curricular suggestions for *language arts, math, social studies, health, and the arts* are featured. Connections also include Science Challenges; Science Extensions; Science, Technology, and Society; and Science and Careers.

**Delta Science Reader**

**Erosion**



**Introduction**

In the Delta Science Reader article, students read about how erosion shapes the Earth's surface. They will learn about the different types of erosion and how they are caused by weathering, gravity, wind, and water. They will also learn about the different types of erosion and how they are caused by weathering, gravity, wind, and water.

**Reading and Thinking**

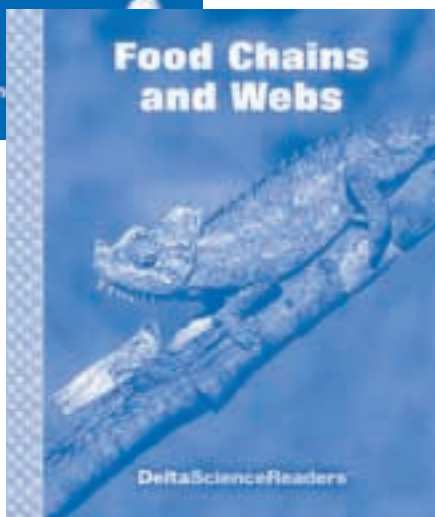
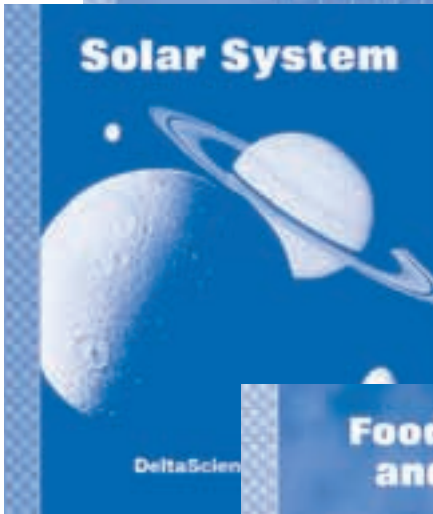
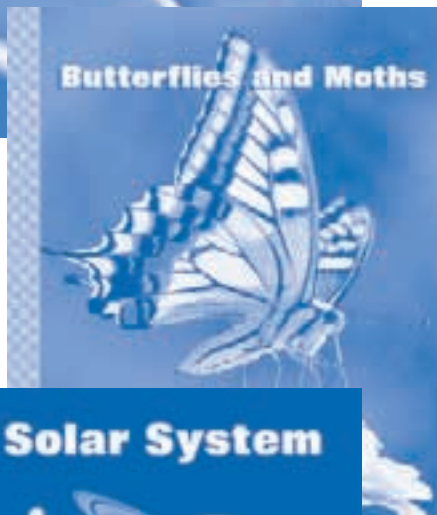
1. Read the article and complete the Reading and Thinking questions.

2. Discuss the article with a partner or in a small group.

3. Write a paragraph about the article.

**Delta Science Reader** Teaching pages for the reader include detailed support for guiding the reading, suggestions for pre- and post-reading preview/summary, assessment questions, and a Writing Link.

# DeltaScienceReaders



**Delta Science Readers** are 16-page nonfiction books for students with informative and engaging text and full-color photos and illustrations. The readers

- ▶ provide science background and information about the unit topic.
- ▶ offer an opportunity for reading in the content area.
- ▶ support and extend the experiences and content of hands-on activities.
- ▶ help students develop informational literacy skills.
- ▶ serve as a home-school link.
- ▶ promote scientific inquiry.

Each reader has three main sections:

1. *Think About . . .*  
key information about the unit topic
2. *People in Science*  
historical biographies, careers in science
3. *Did You Know?*  
high-interest articles or selections

*Delta Science Readers* include standard nonfiction features such as tables of contents, headings, captions, labels, diagrams and maps, and glossaries. Each kit comes with eight copies of a selection of readers. Additional readers and Big Books for grades K–1 may be purchased separately.

# EQUIPMENT AND MATERIALS KIT

Each **Broward County Hands-On Science** kit includes a teacher's guide, eight copies of a selection of *Delta Science Readers*, and materials and equipment needed for a class of 32 students. Some common classroom items may not be included.

Prepaid Living Material Order Cards accompany the kits that require live organisms. Order cards must be faxed or mailed to Delta Education four weeks prior to beginning activities that use the organisms.

Both refill kits and individual replacement parts (line items) are available from Delta Education. For information, call 1-800-258-1302.



*Broward County Hands-On Science Kit—Grade 3*

# P ROCESS SKILLS

**Broward County Hands-On Science** kits promote the process skills essential to science inquiry and science literacy—goals of the *National Science Education Standards* and *Benchmarks for Science Literacy*. Many science process skills are part of and central to other curriculum areas, such as reading and math.

Process Skill	Description
<b>observe</b>	use the senses to identify or learn about an object or an event
<b>compare</b>	look at objects, events, data, or systems to see how they are alike or different
<b>classify</b>	group objects, information, or events into categories based on their properties using a system or method
<b>use numbers</b>	order, count, estimate, or calculate
<b>measure</b>	make quantitative observations using standard or nonstandard units
<b>communicate</b>	share information or ideas orally, in writing, or by using graphic representations
<b>collect, record, display, or interpret data</b>	gather and share information about observations and measurements
<b>predict</b>	state the outcome of a future event, using past observations and experiences
<b>infer</b>	develop an idea based on past observations or experiences
<b>define based on observations</b>	give specific, useful information based on one's own observations and experiences
<b>hypothesize</b>	propose an explanation that can be tested
<b>make and use models</b>	develop a physical or mental model of an object or event
<b>use variables</b>	identify and control factors that may affect the outcome of an experiment
<b>experiment</b>	design a safe procedure to test a hypothesis

# COMMUNICATING ABOUT SCIENCE

## SCIENCE JOURNALS AND PORTFOLIOS

Being able to communicate ideas about science by speaking and writing clearly and effectively is a key goal. Help students organize a way to maintain a record of their work and writing. Whether they use a manila folder, large envelope, or three-ring binder, and whether they call it a science journal, log, or notebook, encourage students to compile all their written work for each quarter.

Ask students to sketch, label, or write about their hands-on activities and readings as often as your schedule allows. Depending on their ages and abilities, encourage them to write their predictions, observations, and conclusions. Discuss these ideas in teams or as a class.

Have students include these writings, as well as their completed activity copymasters, in their science journals.

During the course of each quarter, help students select work to include in a portfolio. Depending on your goals and needs, a journal or portfolio can enable you to

- review students' work.
- provide families with information about students' accomplishments in science.
- assess students' progress.

## FAMILY SUPPORT

Communication between school and the home is essential for students' success. **Broward County Hands-On Science** teacher's guides contain

- ▶ **a School-Home Connection Copymaster** This "Dear Families" letter lets students' families know what they will be doing in science class that year.
- ▶ **Science at Home** Ideas for at-home activities that extend and enrich the Broward program are provided throughout the guide.

# INTEGRATING THE CURRICULUM

**Broward County Hands-On Science** teacher's guides include many opportunities for integrating reading, language arts, math, social studies, and other curriculum areas through science.

## READING AND LANGUAGE ARTS

- ▶ **Delta Science Readers** are a significant reading-for-information opportunity.
- ▶ The teacher's guide presents many effective strategies, opportunities, and ideas for integrating science into language arts and reading.

## MATH

- ▶ Hands-on activities encourage students to measure, use number sense, calculate, and graph.
- ▶ The teacher's guide presents valuable suggestions for applying math skills, such as graphing and measuring, to science content.

## CURRICULUM CONNECTIONS

A Connections page for integrating science with other areas of the curriculum follows every activity. These include:

- **Science and Language Arts** writing, word origin, and literature or poetry connections
- **Science and Math** topic-related ideas for using numbers, measuring, estimating, and graphing
- **Science and Social Studies** links history, geography, and culture to science concepts
- **Science and the Arts** creative and aesthetic activities and projects that showcase students' knowledge of the science topic
- **Science and Health** students apply what they have learned to personal health decisions
- **Science and Careers** students learn about science-related careers

# MEETING THE STANDARDS

## BROWARD COUNTY ELEMENTARY SCIENCE BENCHMARK PLAN

The *Broward County Elementary Science Benchmark Plan* describes which of the Florida State elementary science benchmarks the Broward curriculum covers during each quarter of the school year.

The **Broward County Hands-On Science** program addresses the Broward County benchmarks in all of the following areas:

- The Nature of Matter (Strand A)
- Energy (Strand B)
- Force and Motion (Strand C)
- Processes that Shape the Earth (Strand D)
- Earth and Space (Strand E)
- Processes of Life (Strand F)
- How Living Things Interact with Their Environment (Strand G)
- The Nature of Science (Strand H)

*“In a world filled with the products of scientific inquiry, scientific literacy has become a necessity for everyone. Everyone needs to use scientific information to make choices that arise every day. Everyone needs to be able to engage intelligently in public discourse and debate about important issues that involve science and technology. And everyone deserves to share in the excitement and personal fulfillment that can come from understanding and learning about the natural world.”*

— National Science Education Standards: An Overview

## NATIONAL SCIENCE EDUCATION STANDARDS

The *National Science Education Standards*, published in 1995, was a project of the National Research Council designed to help the nation reach scientific literacy. The standards describe “what students need to know, understand, and be able to do to be scientifically literate at different grade levels.”

The **Broward County Hands-On Science** program addresses the standards in all the following areas:

- Unifying Concepts and Processes in Science
- Science as Inquiry
- Physical Science
- Life Science
- Earth and Space Science
- Science and Technology
- Science in Personal and Social Perspectives
- History and Nature of Science

# WHAT WE BELIEVE

- All students have a natural curiosity about the world around them.
  - All students can be active participants in the scientific process and can become scientifically literate citizens.
  - All students will enjoy learning science when actively engaged in hands-on activities.
  - All students benefit from reading in the content area.
  - All teachers can successfully guide students to learn and enjoy science.
  - Because science is intrinsically motivating and can be present in all subject areas, it can be used to integrate the entire curriculum.
  - Students' knowledge and skills should be assessed in as many modalities as they are taught.
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The **Broward County Hands-On Science** program provides structured hands-on experiences and student readers that invite all students to become actively engaged in science.

- With varied hands-on activities and student readers, the program can enable teachers to implement differentiated instructional strategies and encourages the use of multiple intelligences.
- Activities are structured for cooperative learning to encourage every student to contribute to the group's success.
- *Science Challenge* connections are open-ended and allow students to deepen or broaden their science knowledge.
- *Science, Technology, and Society* connections help students relate what they have learned to the real world.