Integrating the Student Reference Book

As a component of the Science Companion curriculum, the *Habitats Student Reference Book* helps students learn science content and develop their nonfiction reading skills, as well as practice other skills for interpreting science information.

Accessing Science

This resource encourages students to access science in a variety of ways as they encounter lesson concepts in new contexts, use data in different formats, and pose new questions for further exploration. Specifically, the student reference book offers the following:

- Helps students generate new questions and ideas about science concepts
- Lets them read about real world applications of the science content in the lessons
- Explores subjects in depth by offering students reference material and supplementary information
- Provides students with opportunities to interpret information in different formats, including charts, diagrams, illustrations, graphs, photographs, tables, and maps
- Exposes students to additional content that supports science standards and benchmarks, but may not be the central focus of the lessons
- Gives students practice using reference features of the book, such as the glossary and index

Most of the lessons, as indicated in the table on the right, include assigned readings in the student reference book that provide students with in–depth information related to the material and concepts covered in the lessons.

Scheduling Readings

The best time for students to read the student reference book materials depends on the nature of the reading assignment, its role in the lesson, the reading level of your students, and the schedule of your day, among other things.

The **Using the Student Reference Book** section of each lesson offers scheduling suggestions and explains how to integrate the selection into your teaching. It also details how to incorporate various visual information (charts, diagrams, tables, maps, and illustrations) that students work with during the lesson or as part of their extended learning.

For your convenience, the following table summarizes the scheduling suggestions for each lesson's reading selection. Keep in mind that in addition to your science session, the student reference book readings can be done during language arts sessions, as part of independent or silent reading time, or for homework. For children who receive additional reading support, arrange for their resource teachers or aides to work with them to read and comprehend their student reference book assignments.

Lesson	Student Reference Book Section	Student Reference Book Pages	Special Considerations
1	Chapter 1 "What Do All Living Things Need?"	1–12	Pass out the student reference books and review the book's layout with students. Teach the optional Skill Building Activity "Reading Science Books." After Lesson 1, have the children read pages 1–9. The optional section on pages 10–12 answers the question, "What is the difference between a habitat and an environment?" Use it for reading enrichment.
2	None		
3	Chapter 2 "How Do Animals Get What They Need?" Appendix B "Bird Features: How Birds Get Their Food"	13–18 123–132	Before the lesson, assign pages 13–18 of the chapter. This section introduces the concept that physical and behavioral characteristics help animals to survive. Instead of displaying the pictures of representative birds, consider having children refer to the optional chapter, Appendix B. If they do not use the appendix during the lesson, assign the reading afterwards to reinforce the concept that physical characteristics help animals survive.
4	None		

Lesson	Student Reference Book Section	Student Reference Book Pages	Special Considerations
5	Chapter 2 "How Do Animals Get What They Need?"	19–25 26–32	Before the lesson, assign pages 19–25 of Chapter 2. This selection supports the big idea that animals interact because their habitats overlap. The terms in the "Individual, Population, and Community" section can be applied during the reflective discussion. Prior to Lesson 6, have students read pages 26–32 of the student reference book. The reading provides information about how wild animals meet threats in their habitats. The "Passing on Physical Characteristics" section is optional, and can be used for reading enrichment.
6	None		
7	Chapter 3 "How Do Plants Get What They Need to Survive?	33–37	After the lesson, assign the sections "Plant Characteristics" and "Living Together." The optional section, "Living in a Rainforest," on pages 36–37 provides a contrast to the desert habitat. It discusses how plants have many physical characteristics that enable different kinds to share the same environment.
8	Chapter 3 "How Do Plants Get What They Need to Survive?"	38–40	After the lesson, assign the remaining section of Chapter 3, "Surviving in the Wild" to reinforce the concepts learned.
9	None		
10	Chapter 4 "What Is a Biome?"	41–51	Have the children read this chapter after the synthesizing discussion to reinforce and supplement their understanding of what a biome is. The optional "Try This" section on pages 50–51 will help children understand the concept of climate zones. Use it for reading enrichment.
11	Chapter 5 "Aquatic Biomes" Chapter 6 "Forest and Grassland Biomes" Chapter 7 "Desert, Chaparral, and Tundra Biomes"	53–72 73-88 89-102	These chapters provide descriptions and photographs of the biomes they will research in this lesson. Once the children are assigned a biome during the exploration, have them use the table of contents to locate their biome. They read about their biome as an introduction, before consulting additional resources.
12	None		
13	None		
14	None		
15	Chapter 8 "How Do Environments Change?"	103–118	After the lesson, use this optional chapter as reading enrichment to extend the children's understanding about how environments change.
16	None		

Getting Started

As with any nonfiction text, your children will get more out of the reading if they are familiar with how this particular resource presents different kinds of information. When you first distribute the book, "unlock" it for students by previewing it as a group and discussing its key features. Teach the Skill Building Activity "Reading Science Books" on page 244 to give children a short tour of the organization and reference features of the student reference book.

This skill building activity also contains ongoing suggestions to help children absorb the new information and process new vocabulary before, during, and after reading.

When you introduce a new selection, give the children a context and reason to read. Relate the reading topic to the concepts they explore in the lessons, and take advantage of their natural interest in science to encourage them to seek more information in the student reference book.

Skill Building Activity 1

Reading Science Books

A QUICK LOOK

Big Idea

Paying attention to a book's organization can assist reading comprehension.[1]

Overview

Students familiarize themselves with the organization and layout of the *Habitats Student Reference Book*. They are encouraged to look through each section before they begin reading so they can use visual and text cues—such as headings, margin notes, and illustrations—to help understand the material and its relationship to what they already know.

Ongoing reading strategies to help children absorb new information and vocabulary are included at the end of the lesson.

Process Skills

- Observing
- Predicting

Key Notes

- Teach this lesson the first time the students are assigned to read a section of the student reference book.
- The strategies presented in this lesson can be applied to any reading.
- See the Maintenance section for suggestions to help the students comprehend and incorporate subsequent readings throughout the unit.

[1] For research to support this Big Idea, see this publication:

Barton, Mary Lee, and Deborah L. Jordan. *Teaching Reading in Science: A Supplement to Teaching Reading in the Content Areas Teacher's Manual (Second edition)*. (Aurora, CO: McREL [Mid-continent Research for Education and Learning], 2001) Distributed by ASCD.

Skill Building Activity 1

Standards and Benchmarks

As students learn strategies for use in reading science books, they improve their ability to satisfy Science as Inquiry Standard A (Understandings about Scientific Inquiry, Grades K-4): "Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.

"They are better able to understand The Nature of Science Benchmark 1C (The Scientific Enterprise): "Clear communication is an essential part of doing science. It enables scientists to…stay informed about scientific discoveries around the world." They also practice Habits of Mind Benchmark 12D (Communication Skills, Grades 6–8): "Locate information in reference books."

Lesson Goals

1. Become familiar with how the student reference book is organized, and recognize the visual and text cues that may make new material easier to understand.
2. Learn some strategies to use before, during, and after reading to improve one's understanding of new material.

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Materials

Item	Quantity	Notes
Curriculum Items		
Habitats Student Reference Book		

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Preparation

- ❑ Read the "Integrating the Student Reference Book" section on pages 30–33.
- ❑ Familiarize yourself with the content and layout of the student reference book for this unit.

Teaching the Lesson

Engage

Introductory Discussion

1. Distribute the student reference book for this unit and give the children several minutes to look it over and share interesting things they notice with a partner or the group.
2. Explain that this book, like most nonfiction books, has patterns in the way it presents information. Tell the children that if they can recognize how the information is organized, they can get more out of their reading.

Explore

Reviewing Book Features

1. Invite the students to flip through their books as you discuss ways in which the information in the book is presented. If a student finds an example of the topic at hand, have that student call out a page number for others to turn to. Some features and questions you might discuss are:

Book Feature	Questions to Explore It
Chapters, headings, subheadings	• What do they notice about how the pages are organized? • How can they tell when a new topic is about to begin? • How can they tell when topics are related to each other? **TEACHER NOTE:** If the students don't point out how to tell where a new chapter begins, or that topics and subtopics are labeled by headings and subheadings, point these out.

Book Feature	Questions to Explore It
Table of contents	• Where is the table of contents? (*At the beginning of the book*) • What can they find out by skimming this? (*Main topics in the book*)
New words	• Why are some terms printed in bold text? (*These words can be found in the Glossary.*) • Where is the Glossary? (*At the end of the book, before the Index*) When would they want to go there? (*To find word definitions for key terms*) • How can they figure out what an unfamiliar term means? (*Some words are explained by the text or in the margin. Others can be figured out by context. Many are in the Glossary.*) • Do they notice the pronunciation guide next to difficult terms? How does that help?
Reference tools	• Where is the Index? (*At the end of the book*) When would they want to go there? (*To find where to go in the book to read about a particular topic*) • If they had a question about a particular topic, what tools in the book might help them find the answer? (*The table of contents, the index, and the glossary*) **TEACHER NOTE:** You might suggest a specific topic for the students to search for in the current unit.
Visual information and visual cues	• What do the illustrations or photographs add to the information? *(They may give clues about what the topic is, or may present the same information as the text but in a visual way, or may have new information.*) • Why is information sometimes presented by tables, graphs, charts, or diagrams? (*These formats present some kinds of information more effectively than text. Specific answers will vary depending on the examples the class discusses.*) • What information is in the margins? (*Facts, word connections*) • What do they expect to find under the headings "Try This!" and "Think About It!"? (*Suggestions for things to try or think about*) • Where would they look for stories about scientists and the technologies they developed? (*Under "People Doing Science"*) • What other features do they see that might help them as they read this book? (*Answers will vary*)

NOTES

NOTES

2. Ask the students to turn to their first reading assignment. Ask:
   - What is the section about? What do they think its topics and subtopics will be?
   - How do they know? (*Headings, illustrations, definitions, etc.*)
   - How is this topic related to what they are learning?
3. Point out that any time they begin a new reading assignment, they can give themselves a "heads-up" about what to expect if they scan the headings and other features of a section.

Strategies for "Getting It"

Discuss some of the strategies the students in your class use to understand something they are reading. Ideas that might emerge, or that you might want to introduce, include:

- Read a tricky part again.
- Look for pictures that help explain the text.
- Discuss the reading with another person. (Bouncing ideas off of friends or teachers is a great way to understand something.)
- Try to say the ideas in their own words.
- Look up unfamiliar words, or try to figure them out from context.
- Think about why that topic might be in the book.
- If something is hard to understand, consider that maybe there is a problem with the way it is written.
- Think about how the ideas may relate to other ideas they have been learning about. Perhaps draw a web or bubble map to show connections.

TEACHER NOTE: Over the course of the unit, you may want to model some of these ideas for the students with material from the student reference book by "thinking aloud" as you go through a process.

Reflect and Discuss

Synthesizing

1. Ask the students to think about reasons why someone wrote this book. *(To teach, to provide examples, to show data, to tell about something the author thought was interesting, as a reference to allow them to look up topics they want to know more about.)*
2. Point out that this book is a tool. Using it and other books is one more way to learn about science.
3. Have students read the assigned pages. Ask them to do the following while reading:
   - Remember or write down one strategy they used to help themselves understand.
   - Share that strategy with you or a peer when they finish.

Ongoing Learning

Maintenance

With each new reading assignment in the student reference book, consider using some of these strategies before, during, and after reading to help the students absorb the material.

Teacher Note: As an elementary teacher, you probably have excellent strategies in place to help your students read and comprehend, but here are some other ideas to work from.

Previewing a Topic Before *Reading*

- Review the process of "sizing up" the assigned pages before the students begin to read by reviewing headings and other features of the text. Have the students talk to you and each other about the main points they think the reading will cover.
- If a section includes diagrams, tables, charts, or graphs, walk the children through whatever steps you think they'll need to interpret the information, or have them work with partners as they preview these.

Notes

Big Idea

Paying attention to a book's organization can assist reading comprehension.

NOTES

Inviting Interaction with the Text While *Reading*

Reading Strategy	Activity
Reading with a purpose	• When you assign a new section and there is something in particular that you want the students to take away, consider sending them on a mission to find that information. **TEACHER NOTE:** See the Using the Student Reference Book section of the lessons for suggestions about key information.
Asking questions while reading	• Many of the headings in the student reference book are questions. Tell your students to read these sections with the goal of answering these questions. • If a heading is not in a question form, invite your students to turn it into a question and then read to answer that question. For example, they can change the heading "Camouflage" to ask themselves: What is camouflage? How does this help animals survive in the wild?
Self-sticking notes	• Have students write a large exclamation point (**!**) on a few self-sticking notes. Tell them that each exclamation point means "This is where I found an interesting statement." Direct them to place the notes in the margins as they read. • Have students mark other notes with a question mark (**?**). Direct them to place these in the margins beside places where they had questions while reading. Have them write their questions on the notes. • Direct them to write an asterisk (*****) on other notes. Tell them to place these in the margins beside places where they thought "Aha!" or found important information. **TEACHER NOTE:** One way to use this strategy is to introduce each kind of note separately, for different reading assignments, and then invite the students to use all three kinds of notes.
Journal entries	• Ask the students to take notes about their reading in the journal section of their science notebooks.

Synthesizing Material After *Reading*

Synthesizing Strategy	Activity
Working with a partner	• Talk about their answers to the "Think About It" questions. • Identify the main idea and supporting details of what they have read. One way to do this is by drawing a web or bubble map. • Discuss personal experiences related to the text. • Discuss their choices for where they placed their "**!**" (interesting statement) and "*****" (key information) self-sticking notes. *Why* did they make those choices? • Try to answer the questions marked by "**?**" self-sticking notes by using the book and other resources in the room.
Class posters	• Use the statements marked by the "**!**" self-sticking notes to make a class poster titled something like "Interesting Things We Learned About _____." • Record the questions from the "**?**" self-sticking notes on a class poster titled something like "Here Are the Questions We Asked About _____." Write down the students' answers on the chart, if they have found them. • Use the "*****" self sticking notes to make a class poster titled something like "Important Information to Remember About _____."
Working in small groups	• If the students used self-sticking notes as described above, have them meet in small groups to share their choices of where they placed their notes. Direct them to write their interesting facts, questions, and important information on chart paper to share with the rest of the class.
Journal entries	• At any point in the processes above, encourage students to make notes to themselves in the journal section of their science notebooks.

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NOTES

Understanding New Vocabulary

TEACHER NOTE: As always, emphasize the ideas presented in the readings, rather than the memorization of vocabulary. Students learn the meanings of important words by reading them in context, hearing them used, and using them to explain their own observations, thinking, and questions.

Try some of these suggestions to help students transfer new words and concepts into active use:

- **Focus your vocabulary instruction on key terms** already introduced during the lessons rather than explicitly teaching all of the terminology in the student reference book. If your students fully understand the most important terms, they will make associations between new and unknown words independently.

TEACHER NOTE: The key terms in the student reference book are in bold, colored text. These are the words which are defined in the student glossary.

- As much as possible, **personalize the new vocabulary terms** for your students. Have them draw associations between the meaning of a new word and a similar word they already know. Encourage them to use the vocabulary from the lessons or the readings to talk about their own experiences.
- Ask children to **choose a way to remember a word's meaning** such as drawing a picture, selecting an action, or making some other connection to remind them.
- **Create opportunities** throughout the teaching day for your students **to use new words**. Repeated exposure to words through listening, speaking, and writing is the best way to ensure vocabulary development.
- Encourage your students to **listen for the new words on television, radio, and at home** and to **look for the new words in kids' magazines, newspapers, and books**. They can write the context in which the words are used and bring this information into the classroom each morning.
- After completing the reading and the lesson, have your students **graphically display relationships between words** through webbing or bubble maps.

- Teach them how to **take off the end of a word to find the base word or root word**—decomposition becomes decompose, naturalist becomes natural, and digestive becomes digest. Children are likely to have heard or used the related words already.