

Teacher Handbook

Grade 3

Developed by
North Carolina Teachers
for North Carolina Classrooms

We wish to thank the following teachers of Sardis Elementary School in Monroe, North Carolina, for their contribution to this program. A team of expert teachers, led by Teri Marsh, Literacy Specialist, first reviewed hundreds of books and selected those that best supported North Carolina's Standard Course of Study Objectives for Science. They created lesson plans that focused on science content and guided reading skills and then tried them out in their classrooms.

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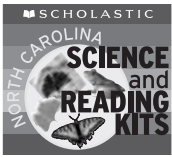
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ISBN: 0-439-79749-7
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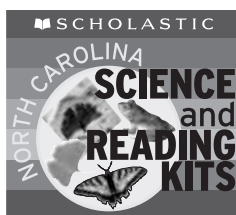
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NORTH CAROLINA SCIENCE and READING KITS

The *North Carolina Science and Reading Kits* for kindergarten through grade five is a unique program designed to teach standards-based science content and build reading skills. The program was created by a team of experienced North Carolina elementary school teachers who saw an opportunity to use nonfiction and fiction trade books as a means of supplementing their science curriculum.

The teachers selected Scholastic trade books that supported the goals and objectives of the North Carolina Standard Course of Study for Science. Once the books were reviewed and approved, teaching plans were developed that not only addressed the science content of each book but also targeted essential reading skills using a guided reading approach. The reading skills in each lesson support the goals and objectives of the Standard Course of Study for Language Arts. The teachers then took the instruction one step further by providing cross-curricular activities that applied the content to writing, vocabulary development, math, social studies, and technology.

The result is an exciting new, multipurpose program that:



■ **Maximizes instructional time** Providing time for content-area instruction is a challenge, especially in elementary classrooms where the teaching of reading skills is of primary importance. With the *North Carolina Science and Reading Kits* teachers can meet science standards within the reading block while teaching reading skills that meet the language arts standards.

■ **Ensures that science instruction meets the needs of all students** The readability of most science textbooks is on or above grade level, which makes them inaccessible to students reading below grade level. The books in the *North Carolina Science and Reading Kits* represent a range of levels so that all students have access to text that they can read with instructional support from the teacher.

■ **Enriches existing science programs and kits** The engaging, leveled books and instructional plans of the *North Carolina Science and Reading Kits* add an extra dimension to classroom science instruction and can be easily adapted to science textbook programs or skills kits.

■ **Expands classroom libraries with high-quality nonfiction books** Research increasingly supports the need for more access to nonfiction books in elementary school classrooms. Each *North Carolina Science and Reading Kit* includes 132 nonfiction leveled books that will capture students' attention and are appropriate for independent reading as well as for science instruction.

TEACHING WITH TRADE BOOKS

The Importance of Nonfiction Text in the Classroom

There are many compelling reasons to include nonfiction books in classroom libraries and instructional programs and to introduce them at earlier grades. As students move through the grades, “reading to learn” becomes a major focus in school (Chall, 1983). Students are expected to learn by reading textbooks, reference materials, and other informational sources such as the Internet. As they progress through high school and college, they will encounter increasingly more difficult texts. Introducing them to nonfiction as early as possible can only help them succeed later on in both their academic and adult lives.



Although students’ first encounters with reading are often fiction in the form of stories and chapter books, most of the reading they will do as adults involves nonfiction. Think of what you read everyday: newspapers, lesson plans, textbooks, forms, reports, instructions, lists, signs, even recipes—these are all nonfiction. According to one study 96% of the information on the Internet is nonfiction (Kamil & Lane, 1998).

Children, like adults, have different preferences in what they choose to read. Some like fiction, while others prefer nonfiction, and

some have no preference. For those children who prefer nonfiction, including more informational books in classroom libraries may improve attitudes toward reading (Caswell & Duke, 1998). One reason that many children may prefer nonfiction text is that it answers their questions about the world. Children are more motivated when they are reading for the purpose of answering questions that are of interest to them. And when children are reading something that interests them their reading is likely to improve (Schiefele, Krapp, & Winteler, 1992).

How the Books Were Selected

For the *North Carolina Science and Reading Kits* the teachers reviewed hundreds of nonfiction, and some fiction, trade books before selecting the titles for each grade. Each title and collection was carefully evaluated based on the following criteria:

- All books must be age-appropriate and engaging for the intended learner.
- The content of the book must meet at least one, and ideally more than one, of the objectives of the North Carolina Standard Course of Study for Science.
- The book must support at least one of the objectives of the North Carolina Standard Course of Study for Language Arts.
- The grade-level collection must include books at a variety of reading levels.

Kindergarten and grade one each have 42 titles, and grades two, three, four, and five each have 27 titles. Each grade-level collection contains a combination of single titles for reading aloud and multiple copies for guided reading for a total of 132 books.

Using the Science Kits

The program is designed to be flexible so that it can meet the requirements of a variety of instructional plans and classroom configurations.

As mentioned earlier, in elementary classrooms teaching reading skills is of primary importance and finding time for content-area instruction is a challenge. The *North Carolina Science and Reading Kits* help to solve this dilemma by teaching the science content of the books through a guided reading approach.

The Books

The books in the collection were selected for either reading aloud or guided reading. The read-aloud books are meant to be read by the teacher to the whole group. Books were selected for this category for several reasons:

- they are particularly engaging or interesting and are well suited for introducing a new science topic that the whole class will study;
- the content and vocabulary are unfamiliar and need explanation;
- the reading level is more difficult and the text is more accessible when read aloud and discussed as a group.



The majority of books, especially in the upper grades, are appropriate for guided reading in small groups. The chart on page 9 lists the read-aloud and guided reading titles for grade three.

The Teaching Plans

There is a teaching plan for each book in the collection. The teaching plans are organized according to the science goal each book supports. The books are listed in alphabetical order under each goal, and the objectives covered are also noted.



The lessons can be taught in any order. Books can be used to supplement or extend science instruction from textbooks or skill kits. Books on the same topic may be introduced together so students can learn about a topic in depth or compare and contrast information from different sources.



TEACHING WITH TRADE BOOKS

Teaching the Lesson

The teaching plans follow the same general format for both read-aloud and guided reading instruction. The lesson begins with an introduction to the book and the topic. Depending on the topic and whether it is being explored for the first time or whether students are familiar with it, this can include:

- a discussion of the main topic of the book with the teacher eliciting students' prior knowledge or relevant experiences;
- introduction of new or unfamiliar vocabulary that is essential to understanding the topic;
- drawing attention to special text features such as photographs, diagrams, graphs, timelines, sidebars, glossaries and indexes that help make the text accessible to readers;
- encouraging students to predict what they will learn from the book; and
- instructions for important questions or ideas to pay attention to while reading or activities to complete.

Once the book has been introduced, students are ready to listen or read the book on their own. For guided reading lessons, students should read the whole text or a particular section assigned by the teacher. Reading may be oral or silent depending on the reading skill and level of the group. As students read the teacher can observe, offering support when necessary. This is also a good time to focus on new vocabulary and decoding skills such as consonant blends, inflectional endings, or compound words.

After students finish reading, discuss the main idea of the text, following up on questions or predictions students made about the

book earlier. Group activities such as filling out a K-W-L chart should be completed at this time. Follow-up activities to be completed by individuals, partners, or the whole group reinforce the science topic or focus on specific reading skills. Students should be encouraged to revisit the text as they complete these activities.

Extending the Lesson

These activities apply the science content of the books to math, social studies, writing, vocabulary development, and technology.

Additional science activities are also included here. Written by North Carolina teachers, these activities are grade appropriate and support the content-area curricula for math, social studies, and writing. Many of the technology activities list specific Web sites. You may want to preview these before allowing students to access them to ensure that the content is appropriate and that the site is operational.

Blackline Masters

Blackline masters for many of the lessons are included at the end of the teacher's handbook.

Some of these are specific to a particular book or lesson, but many, such as idea webs, Venn diagrams, or data recording sheets for experiments, are generic and can be used for multiple lessons.

Classroom Libraries

A list of additional nonfiction books on grade-level science topics is included for teachers who want to expand their classroom libraries. The books are leveled for independent reading.

READ-ALOUD and GUIDED READING Books—Grade Three

Title	Author	Readability Levels		
READ-ALOUD BOOKS		DRA™	GRL	Lexile®
<i>The Earth in Space</i>		34-38	P	830L
<i>The Magic School Bus Lost in the Solar System</i>		34-38	P	480L
<i>The Magic School Bus Meets the Rot Squad</i>		34-38	P	470L
<i>Peanuts</i>		18-20	K	
<i>Plant Life</i>		34-38	O	880L
<i>Muscles</i>		34-38	O	1030L
GUIDED READING BOOKS				
<i>Bones! All Kinds of Hands, All Kinds of Feet</i>		18-20	K	530L
<i>A Book About Planets and Stars</i>		32	O	760L
<i>Cactus Hotel</i>		18-20	K	790L
<i>Can You Hear a Shout in Space?</i>		34-38	NR	770L
<i>Constellations</i>		30	N	760L
<i>Desert Giant</i>		24-28	L	980L
<i>From Acorn to Oak Tree</i>		14	H	BR
<i>From Seed to Plant</i>		30	N	660L
<i>The Magic School Bus Gets Planted</i>		34-38	P	530L
<i>The Magic School Bus Sees Stars</i>		34-38	P	580L
<i>Me and My Amazing Body</i>		24-28	M	710L
<i>The Moon</i>		14	H	560L
<i>Outside and Inside You</i>				730L
<i>Postcards from Pluto</i>		34-38	P	490L
<i>The Reason for a Flower</i>		34-38	P	
<i>Saguaro Cactus</i>		30	N	840L
<i>The Search for the Missing Bones</i>		34-38	P	550L
<i>Seeing Stars</i>		30	N	660L
<i>Skeletons! Skeletons! All About Bones</i>		34-38	O	630L
<i>The Solar System</i>		16	I	490L
<i>Stargazers</i>		34-38	O	640L

Leveling information is not currently available for all books. Check www.scholastic.com for updates.

GOALS AND OBJECTIVES

Science Curriculum

The focus for third grade students is on identifying systems and patterns in systems. Systems are the units of investigations. A system is an interrelated group of objects or components that form a functioning unit. Students learn to identify portions of a system to facilitate investigation. Systems have boundaries, components, resources, flow and feedback. Guide student learning to continue to emphasize the unifying concepts previously introduced including evidence, explanation, measurement, order, organization, and change as well as the introduction at grade three of systems. The strands provide a context for teaching the content goals.

STRANDS: Nature of Science, Science as Inquiry, Science and Technology, Science in Personal and Social Perspectives

SCIENCE COMPETENCY GOAL 1: The learner will conduct investigations and build an understanding of plant growth and adaptations.

1.01 Observe and measure how the quantities and qualities of nutrients, light, and water in the environment affect plant growth.

1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment.

1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction.

1.04 Explain why the number of seeds a plant produces depends on variables such as light, water, nutrients, and pollination.

1.05 Observe and discuss how bees pollinate flowers.

1.06 Observe, describe and record properties of germinating seeds.

SCIENCE COMPETENCY GOAL 2: The learner will conduct investigations to build understanding of soil properties.

2.01 Observe and describe the properties of soil: color, texture, capacity to hold water.

2.02 Investigate and observe that different soils absorb water at different rates.

2.03 Determine the ability of soil to support the growth of many plants, including those important to our food supply.

2.04 Identify the basic components of soil: sand, clay, humus.

2.05 Determine how composting can be used to recycle discarded plant and animal material.

2.06 Determine the relationship between heat and decaying plant matter in a compost pile.

SCIENCE COMPETENCY GOAL 3: The learner will make observations and use appropriate technology to build an understanding of the earth/moon/sun system.

3.01 Observe that light travels in a straight line until it strikes an object and is reflected and/or absorbed.

3.02 Observe that objects in the sky have patterns of movement including the sun, moon, stars.

3.03 Using shadows, follow and record the apparent movement of the sun in the sky during the day.

3.04 Use appropriate tools to make observations of the moon.

3.05 Observe and record the change in the apparent shape of the moon from day to day over several months and describe the pattern of changes.

3.06 Observe that patterns of stars in the sky stay the same, although they appear to move across the sky nightly.

SCIENCE COMPETENCY GOAL 4: The learner will conduct investigations and use appropriate technology to build an understanding of the form and function of the skeletal and muscle systems of the human body.

4.01 Identify the skeleton as a system of the human body.

4.02 Describe several functions of bones: support, protection, locomotion.

4.03 Describe the functions of different types of joints: hinge, ball and socket, gliding.

4.04 Describe how different kinds of joints allow movement and compare this to the movement of mechanical devices.

4.05 Observe and describe how muscles cause the body to move.

English Language Arts Curriculum

STRANDS: Oral Language, Written Language, and Other Media/Technology

LANGUAGE ARTS COMPETENCY GOAL 1: The learner will apply enabling strategies and skills to read and write.

1.01 Apply phonics and structural analysis to decode words (e.g., roots, suffixes, prefixes, less common vowel patterns, syllable breaks).

1.02 Apply meanings of common prefixes and suffixes to decode words in text to assist comprehension.

1.03 Integrate prior experiences and all sources of information in the text (grapho-phonetic, syntactic, and semantic) when reading orally and silently.

1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary

through wide reading; word study; listening; discussion; book talks; book clubs; seminars; viewing; role play; studying author's craft.

1.05 Use word reference materials (e.g., dictionary, glossary) to confirm decoding skills, verify spelling, and extend meanings of words.

1.06 Read independently daily from self-selected materials (consistent with the student's independent reading level) to increase fluency; build background knowledge; extend vocabulary.

GOALS AND OBJECTIVES

LANGUAGE ARTS COMPETENCY GOAL 2: The learner will apply strategies and skills to comprehend text that is read, heard, and viewed.

2.01 Use metacognitive strategies to comprehend text (e.g., reread, read ahead, ask for help, adjust reading speed, question, paraphrase, retell).

2.02 Interact with the text before, during, and after reading, listening, or viewing by setting a purpose; previewing the text; making predictions; asking questions; locating information for specific purposes; making connections; using story structure and text organization to comprehend.

2.03 Read a variety of texts, including fiction (short stories, novels, fantasies, fairy tales, fables); nonfiction (biographies, letters, articles, procedures and instructions, charts, maps); poetry (proverbs, riddles, limericks, simple poems); drama (skits, plays).

2.04 Identify and interpret elements of fiction and nonfiction and support by

referencing the text to determine the author's purpose; lesson and/or message; plot; conflict; sequence; resolution; main idea and supporting details; cause and effect; fact and opinion; point of view (author and character); author's use of figurative language (e.g., simile, metaphor, imagery).

2.05 Draw conclusions, make generalizations, and gather support by referencing the text.

2.06 Summarize main idea(s) from written or spoken texts using succinct language.

2.07 Explain choice of reading materials congruent with purposes (e.g., solving problems, making decisions).

2.08 Listen actively by facing the speaker; making eye contact; asking questions to clarify the message; asking questions to gain additional information and ideas.

LANGUAGE ARTS COMPETENCY GOAL 3: The learner will make connections through the use of oral language, written language, and media and technology.

3.01 Respond to fiction, nonfiction, poetry, and drama using interpretive, critical, and evaluative processes by considering the differences among genres; relating plot, setting, and characters to own experiences and ideas; considering main character's point of view; participating in creative interpretations; making inferences and drawing conclusions about characters and events; reflecting on learning, gaining new insights, and identifying areas for further study.

3.02 Identify and discuss similarities and differences in events, characters, concepts and ideas within and across

selections and support them by referencing the text.

3.03 Use text and own experiences to verify facts, concepts, and ideas.

3.04 Make informed judgments about television productions.

3.05 Analyze, compare and contrast printed and visual information (e.g., graphs, charts, maps).

3.06 Conduct research for assigned and self-selected projects (with assistance) from a variety of sources (e.g., print and non-print texts, artifacts, people, libraries, databases, computer networks).

LANGUAGE ARTS COMPETENCY GOAL 4: The learner will apply strategies and skills to create oral, written, and visual texts.

4.01 Read aloud grade-appropriate text with fluency, comprehension, and expression.

4.02 Use oral and written language to present information in a sequenced, logical manner; discuss; recount and narrate; explain own learning; sustain conversation on a topic; report information on a topic; share information and ideas; answer open-ended questions.

4.03 Share written and oral products in a variety of ways (e.g., author's chair, book making, publications, discussions, presentations).

4.04 Use planning strategies (with assistance) to generate topics and to organize ideas (e.g., drawing, mapping, discussing, listing).

4.05 Identify (with assistance) the purpose, the audience, and the appropriate form for the oral or written task.

4.06 Compose a draft that conveys major ideas and maintains focus on the topic by using preliminary plans.

4.07 Compose a variety of fiction, nonfiction, poetry, and drama selections using self-selected topics and forms (e.g., poems, simple narratives, short reports, learning logs, letters, notes, directions, instructions).

4.08 Focus reflection and revision (with assistance) on target elements by clarifying ideas; adding descriptive words and phrases; sequencing events and ideas; strengthening word choice; combining short, related sentences.

4.09 Produce work that follows the conventions of particular genres (e.g., personal narrative, short report, friendly letter, directions and instructions).

4.10 Explore technology as a tool to create a written product.

LANGUAGE ARTS COMPETENCY GOAL 5: The learner will apply grammar and language conventions to communicate effectively.

5.01 Use correct capitalization (e.g., geographical place names, holidays, special events, titles) and punctuation (e.g., commas in greetings, dates, city and state; underlining book titles; periods after initials and abbreviated titles; apostrophes in contractions).

5.02 Use correct subject/verb agreement.

5.03 Demonstrate understanding by using a variety of complete sentences (declarative, imperative, interrogative, and exclamatory) in writing and speaking.

5.04 Compose two or more paragraphs with topic sentences; supporting details; sufficient elaboration; appropriate, logical sequence.

5.05 Use a number of strategies for spelling (e.g., sound patterns, visual patterns, silent letters, less common letter groupings).

5.06 Proofread own writing for spelling and correct most misspellings independently with reference to resources (e.g., dictionaries, glossaries, word walls).

5.07 Edit (with assistance) to use conventions of written language and format.

5.08 Create readable documents with legible handwriting (manuscript and cursive).

THE TEACHING PLAN

Books are designated for either reading aloud or guided reading.

The genre, reading levels, page count and vocabulary words are listed at the beginning of the lesson for easy reference. Special features such as photographs, charts, or diagrams are also noted.

Each lesson begins with a brief description of the book so teachers can familiarize themselves with the content and features.

This special section alerts teachers to materials or preparations necessary for teaching the lesson and may also offer background information to support the content.

Each book aligns with one or more of the science and language arts objectives from North Carolina's Standard Course of Study. Critical thinking skills relating to cognition, interpretation, critical stance and connections are also identified for each lesson.

GUIDED READING



Desert Giant

By Barbara Bash

Book Features

Genre: Informational picture book
Levels: DRA™—24-28; GRL—L; Lexile® Measure—980L
Format: 32 pages, informational text, illustrations
Vocabulary: aquatic, saguaro, accordion-like, callous, nocturnal, nectar, pollinate, pulp, larvae, javelina, decomposes

Summary

The role of the saguaro cactus as a home for animals, a source of food for people and animals, a material for tools, and an important element in the desert ecology is covered in this book. Readers learn how the Tohono O'odham Indians benefit in particular from this large plant.

FYI

Materials

Senses chart such as the one shown here:

Sight	Sound	Smell	Touch	Taste

List of vocabulary words, one per student
Owl Moon by Jane Yolen, sticky notes
 Blackline master: Senses of the Desert, p. 70
 Four cactus plants

Introduce the Book

Before handing out the books ask students if they have ever been to a desert. Call on volunteers to describe what the desert is like. Then ask students to close their eyes and imagine what a desert might look, smell, taste, sound, and feel like. Explain that this is called visualizing; good readers often use this technique when reading a text. Have students think in silence for a minute, then open their eyes and give you descriptions. Write their descriptions on the senses chart.

North Carolina Standard Course of Study Objectives

Science: 1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment. 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction.

Language Arts: 2.01 Use metacognitive strategies to comprehend text. 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text and asking questions. 2.03 Read a variety of texts including nonfiction.

Critical Stance: Visualize

Connections: Text to world

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Whether it is a read-aloud or guided reading lesson, the introduction offers strategies for activating prior knowledge, previewing the content, introducing skills, and highlighting book features.



Tell students to check their ideas about the desert as they read the book.

Introduce and discuss the vocabulary words. Point out that students have encountered some of these words in other books. Give each student a copy of the word list, and ask students to check off the words as they come to them in the book.

Read the Book

Tell students to practice visualizing as they read. Model how you would do this with another book, *Owl Moon* by Jane Yolen. Read snippets from the story and explain what you are visualizing. For example: sight – darkness, strange shadows; smell – scent of Christmas trees; touch – cold air stinging your cheeks; hearing – feet crunching in the snow; taste – the frost on your lips like ice. Point out how visualizing helps you appreciate the book's language and enjoy and understand the story. Have students mark the places where they are visualizing in *Desert Giant* with sticky notes.

Revisit the Book

Discuss the places students marked and add new examples to the senses chart. If something is already on the chart from the pre-reading visualization, point out that some people made good predictions about the desert. To reinforce the lesson, provide students with a copy of the blackline master, Senses of the Desert on page 70. Have them complete the chart.

Extend the Lesson

SCIENCE

Obtain several cactus plants. Have students make predictions about which will survive and thrive under these conditions: one plant gets watered every day, one plant gets watered twice a week, one plant gets watered once a week, and one once a month. Follow through with this plan for a couple of months. Observe the plants' growth and talk about why some plants do well and others don't.

WRITING

Have students reread the first page of the book, and note that the author suggests that the cacti in the desert forest might be thought of as Saguaro People. Ask students what these "people" might say to one another in a conversation about their environment. Have students write up imaginary conversations among the saguaro. Encourage students to use facts and sensory images from the book. Set aside time for students to share their conversations.

TECHNOLOGY

You might have students research the history and culture of the Tohono O'odham Indians, formerly known as the Papago. On the Web students can access:

www.arizonan.com/Indianlands/tohonoOodham

The last section of the teaching plan focuses on cross-curricular activities in writing, vocabulary development, science, social studies, math, and technology. These activities enable students to apply what they have learned to other content areas and to strengthen their skills.

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Additional teaching strategies reinforce what students have learned. Whole class, small group, and individual activities give students the opportunity to practice newly acquired skills and expand content-area knowledge.

This section offers questions and strategies to support comprehension and vocabulary development and points out book features that help make the text accessible.

GUIDED READING



Cactus Hotel

By Brenda Guiberson

Book Features

Genre: Informational picture book

Levels: DRA™—18-20; GRL—K; Lexile® Measure—790L

Format: 32 pages, informational text, illustrations

Vocabulary: paloverde, spiny, saguaro, brilliant, beckon, Gila, millipede

Summary

This beautifully illustrated book tells the story of a saguaro cactus in the Sonoran Desert. It describes the conditions under which the cactus flowers from a seed under a paloverde, and tells of its years as a source of food and a home for countless desert animals. After 200 years the cactus falls in the wind to the desert floor, where still other creatures find homes in it.

FYI

Materials

Scissors

U.S. map

Graph paper, crayons

North Carolina Standard Course of Study Objectives

Science: 1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment. 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, reproduction.

Language Arts: 1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary through word study. 2.02 Interact with the text before, during, and after reading, listening, or viewing by making connections. 3.05 Analyze, compare and contrast printed and visual information.

Cognition: Vocabulary in context

Critical Stance: Compare and contrast

Connections: Text to world



Introduce the Book

Create a K-W-L (*What We Know; What We Want to Know; What We Learned*) chart on the board to find out what students know about cacti. Ask students what they already know about cacti and list their responses in the first column. Then display the book and explain that it is about a saguaro cactus. Have students suggest some things they want to learn about these plants. Tell students that after reading the book, they will be able to add information to the last column.

Introduce and review the vocabulary words. Ask students to raise their hands when they come to a vocabulary word in the text.

Read the Book

As students read, ask them to note how different animals use the saguaro for their needs. Ask questions such as: *How does the pack rat use the saguaro? How does the jackrabbit use the cactus?* Continue by having students explain how these animals use the cactus: Gila woodpecker, elf owl, white-winged dove, insects, bats, millipede, scorpion, ants, termites.

Revisit the Book

After reading, have students explain why the book is titled *Cactus Hotel*. Talk about the different animals that visit the cactus and how they use the saguaro. Follow up by asking questions such as: *How does a tree in the forest provide for animals in comparison to the cactus? How is a bird's use of the cactus different than an insect's?*

Extend the Lesson

SCIENCE

Have students make a Venn Diagram and compare a cactus with an oak tree (or any other tree you suggest). Display and discuss the diagrams to help students understand the similarities and differences.



SOCIAL STUDIES

Read the last page in the book, then have students locate the following on a map of the United States: Arizona, southern Arizona, the Sonoran Desert. Explain that this unique environment extends to the northern part of Mexico, our neighbor on the south. Interested students might research more about the Sonoran Desert.

1+2 MATH

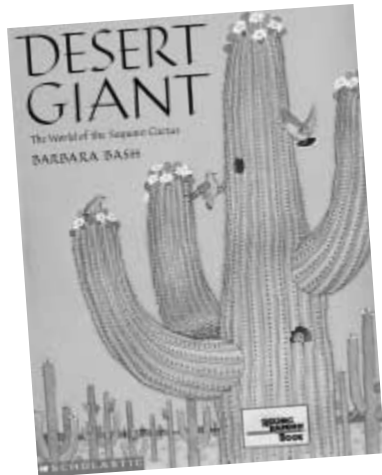
Students can make a timeline on graph paper to show the life of a saguaro cactus that is planted today. Using information from the book, have students figure out the year in the future when the cactus is: 2 ft. tall, 10 ft. tall, 18 ft. tall, when it falls. Ask students to illustrate their timelines with pictures of the cactus for each of these years. As an enrichment question you might ask: *If a cactus fell today, when did it sprout?* (Hint: work backwards.)



WRITING

Tell students to imagine that they are visiting the Sonoran Desert and are there on the night of the year when the saguaro cactus blooms. Have students write a postcard to a friend describing what they saw and what happened.

GUIDED READING



Desert Giant

By Barbara Bash

Book Features

Genre: Informational picture book

Levels: DRA™—24-28; GRL—L; Lexile® Measure—980L

Format: 32 pages, informational text, illustrations

Vocabulary: aquatic, saguaro, accordion-like, callous, nocturnal, nectar, pollinate, pulp, larvae, javelina, decomposes

Summary

The role of the saguaro cactus as a home for animals, a source of food for people and animals, a material for tools, and an important element in the desert ecology is covered in this book. Readers learn how the Tohono O'odham Indians benefit in particular from this large plant.

FYI

Materials

Senses chart such as the one shown here:

Sight	Sound	Smell	Touch	Taste

List of vocabulary words, one per student
Owl Moon by Jane Yolen, sticky notes
Blackline master: Senses of the Desert,
p. 70
Four cactus plants

Introduce the Book

Before handing out the books, ask students if they have ever been to a desert. Call on volunteers to describe what the desert is like. Then ask students to close their eyes and imagine what a desert might look, smell, taste, sound, and feel like. Explain that this is called visualizing; good readers often use this technique when reading a text. Have students think in silence for a minute, then open their eyes and give you descriptions. Write their descriptions on the senses chart.

North Carolina Standard Course of Study Objectives

Science: 1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment. 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction.

Language Arts: 2.01 Use metacognitive strategies to comprehend text. 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text and asking questions. 2.03 Read a variety of texts including nonfiction.

Critical Stance: Visualize

Connections: Text to world



Tell students to check their ideas about the desert as they read the book.

Introduce and discuss the vocabulary words. Point out that students have encountered some of these words in other books. Give each student a copy of the word list, and ask students to check off the words as they come to them in the book.

Read the Book

Tell students to practice visualizing as they read. Model how you would do this with another book, *Owl Moon* by Jane Yolen. Read snippets from the story and explain what you are visualizing. For example: sight – darkness, strange shadows; smell – scent of Christmas trees; touch – cold air stinging your cheeks; hearing – feet crunching in the snow; taste – the frost on your lips like ice. Point out how visualizing helps you appreciate the book’s language and enjoy and understand the story. Have students mark the places where they are visualizing in *Desert Giant* with sticky notes.

Revisit the Book

Discuss the places students marked and add new examples to the senses chart. If something is already on the chart from the pre-reading visualization, point out that some people made good predictions about the desert. To reinforce the lesson, provide students with a copy of the blackline master, Senses of the Desert on page 70. Have them complete the chart.

Extend the Lesson

SCIENCE

Obtain several cactus plants. Have students make predictions about which will survive and thrive under these conditions: one plant gets watered every day, one plant gets watered twice a week, one plant gets watered once a week, and one once a month. Follow through with this plan for a couple of months. Observe the plants’ growth and talk about why some plants do well and others don’t.

WRITING

Have students reread the first page of the book, and note that the author suggests that the cacti in the desert forest might be thought of as Saguaro People. Ask students what these “people” might say to one another in a conversation about their environment. Have students write up imaginary conversations among the saguaro. Encourage students to use facts and sensory images from the book. Set aside time for students to share their conversations.

TECHNOLOGY

You might have students research the history and culture of the Tohono O’odham Indians, formerly known as the Papago. On the Web students can access:
www.arizonan.com/Indianlands/tohonoOdham

GUIDED READING



From Acorn to Oak Tree

By Jan Kottke

Book Features

Genre: Nonfiction

Levels: DRA™—I4; GRL—H; Lexile® Measure—BR

Format: 24 pages, informational text, photographs, table of contents, glossary, index

Vocabulary: acorn, leaves, root, shoot, sprout

Summary

This *Welcome to Reading!* book offers a look at how an acorn grows and develops into an oak tree. Clear photographs illustrate the simple text.

FYI

Materials

Acorns

Paper cups, soil

Introduce the Book

Introduce the book by showing students some acorns. Ask: *What do acorns become?* Help students realize that acorns grow into oak trees. Then ask: *Do you think all acorns become trees? What else happens to acorns?* Students might recall that squirrels gather these nuts for food.

Read aloud each vocabulary word on page 22. Ask for volunteers to offer definitions of each word, then read the book definitions. Point out the pronunciation guides in parentheses.

North Carolina Standard Course of Study Objectives

Science: I.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction.

Language Arts: I.03 Integrate prior experiences and all sources of information in the text when reading orally and silently. I.06 Read independently daily from self-selected materials to increase fluency, build background knowledge, and extend vocabulary.

Cognition: Text features, word study

Interpretation: Make predictions

Connections: Text to world



Read the Book

As students read, have a volunteer positioned at the board. Call on students to tell the volunteer what to illustrate from each page. Explain that students should refer to the text and photographs.

Volunteer draws an acorn. (page 4)

Shows a crack in the acorn with a shoot pushing toward the soil. (page 6)

Adds a sprout pushing up from the acorn. (page 8)

Adds some leaves to the sprout. (page 10)

Adds more leaves. (page 12)

Draws a large oak tree. (page 14)

Draws flowers on a branch of the tree. (page 18)

Shows acorns on the branch. (page 20)

Revisit the Book

Use the drawings to have students retell the cycle of an acorn to an oak tree. Encourage students to add details and use the vocabulary words. Talk about how long this process takes. Point out that like a saguaro cactus, an oak tree can live for well over 100 years.

Extend the Lesson

SCIENCE

Students might plant acorns in soil in paper cups. Add water and place the cups in good light; then observe and record any changes over several days. To study variables, put one acorn in a cup with no soil, put another in a cup of soil but with no water, and a third in a cup with soil and water but no light, and the last in a cup with soil, water and a good source of sunlight. Have students predict the outcome of each acorn's growth, then observe and verify their predictions over several days.

WRITING

Suggest that students write the biography of an oak tree using the basic information from the book and other facts that they research. Set aside time for students to read aloud their biographies.

TECHNOLOGY

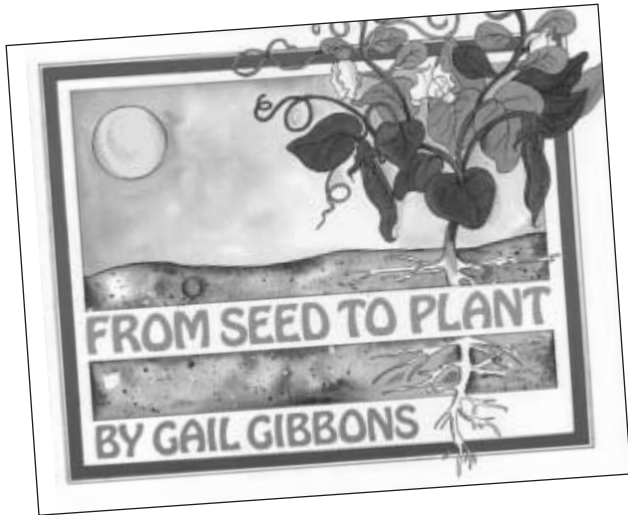
Students can access more information about the many different kinds of oak trees, the products made from these trees, and the uses for acorns by visiting a website such as: www.about-oak-trees.com.

SOCIAL STUDIES

Tell students that the oak tree is the national tree of the United States and also the state tree of Illinois. Have students learn more about trees as national and state symbols by visiting:

www.arborday.org/programs/nationaltree and www.museum.state.il.us/exhibits/symbols/tree.

GUIDED READING



From Seed to Plant

By Gail Gibbons

Book Features

Genre: Nonfiction

Levels: DRA™—30; GRL—N; Lexile® Measure—660L

Format: 32 pages, informational text, illustrations, diagrams, project

Vocabulary: pollination, parachutes, germination, stamens, pistil, stigma, sepal, ovules

Summary

Well-known author Gail Gibbons describes various kinds of seeds, explains the parts of a flower, and takes readers through the process of pollination and growth. Students also learn what a seed needs to germinate and become a full-grown plant.

FYI

Materials

Poster pad

Blackline master: The Parts of a Flower, p. 71

Glass jars, bean seeds, black construction paper, clay pots, small trowels

Seed catalogs, calendars

Introduce the Book

Build background knowledge by asking if any students have ever helped someone in a garden or planted seeds and watched them grow. Encourage students to recall what seeds might need to grow. Tell students they will be reading a book about how seeds become plants.

Write the vocabulary words on the board. Ask students what the words *pollination* and *germination* have in common. Draw attention to the suffix *-ion*, and explain that it has been added to the words *pollinate* and *germinate*. The suffix changes the words from verbs to nouns that describe a process.

North Carolina Standard Course of Study Objectives

Science: 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction. 1.05 Observe and discuss how bees pollinate flowers. 1.06 Observe, describe and record properties of germinating seeds.

Language Arts: 1.02 Apply meanings of common prefixes and suffixes to decode words in text to assist comprehension. 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine the sequence and cause and effect.

Cognition: Sequence

Interpretation: Cause and effect



Read the Book

As students read, emphasize the sequence by writing these words on a poster pad:

pollination, seed grows, fruit or pod grows, fruit or pod ripens and breaks open, seeds scatter, seeds are planted or settle in soil, seeds germinate, roots form and shoots grow, leaves grow, flower buds form.

Revisit the Book

Use the sequence to review the book with students. Ask questions such as:

What causes a seed to sprout?

What is the effect of a plant being pollinated?

What is the effect of a bird eating berries?

What would cause seeds from the same plant to end up in different places?

Reinforce what students have learned by providing them with the blackline master, The Parts of a Flower on page 71. Instruct students to use the words from the box to label the flower parts. Students may also wish to color the diagram.

Extend the Lesson

SCIENCE

Have students work in small groups to try the project “From Seed to Plant” in the book. Provide each group with the materials needed to complete the first three steps. Instruct the groups to observe their jars each day and record what they see. When the beans have sprouted, have students do steps five, six, and seven.

Remind students that they eat many parts of plants. As homework challenge students to name a plant where people eat each of these parts:

stem

root

seed

leaves

fruit

bulb

flower

tuber

✍️ WRITING

Have students read the plant and seed facts on the last page of the book. Then have them work in small groups to research and write minibooks on other interesting plant facts. Students can place their minibooks in a science corner as a class reference.

1+2 MATH

Bring in seed catalogs and calendars, and have students use them to calculate when various seeds will germinate. Give students a list of cities in different parts of the country. Draw attention to the frost maps in the catalogs and have students figure out when it is safe to plant in each city.

GUIDED READING



The Magic School Bus Gets Planted

Adapted by Lenore Notkin

Book Features

Genre: Informational Fiction

Levels: DRA™—34-38; GRL—P; Lexile® Measure—530L

Format: 32 pages, narrative text, illustrations, speech balloons

Vocabulary: photosynthesis, carbohydrates, papier-mache, volunteered, deduction, particles, incredible, chloroplasts, somersault

Summary

Adapted from the Magic School Bus television show, this book features Ms. Frizzle taking her class on a field trip to the inside of a plant. While there her students learn about how a plant produces food.

FYI

Materials

Chart paper

Two houseplants

Introduce the Book

To activate prior knowledge, ask students the following questions:

Have you ever read a Magic School Bus book or seen one of the television shows?

What usually happens in these stories?

Is there a mystery or a problem?

How is it solved?

North Carolina Standard Course of Study Objectives

Science: 1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment.

Language Arts: 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text and using story structure and text organization to comprehend. 3.01 Respond to fiction, nonfiction, poetry, and drama using interpretive, critical, and evaluative processes by participating in creative interpretations.

Cognition: Story elements

Interpretation: Problems/clues chart before and after reading

Critical Stance: Character analysis

Connections: Pre-reading questions



Encourage students to talk about how Ms. Frizzle's class always goes on a field trip to figure out something. Have students preview the book to look for problems or clues. Write their responses on chart paper. Explain that a problem would be something like, "I don't know what the word soggy means," or "Why is that character wearing a cow costume?" A clue would be something like, "I think this story might be about 'Jack and the Beanstalk' because I see a beanstalk and a character that looks like Jack," or "This story has something to do with plants because I see lots of illustrations of plants."

Write the vocabulary words on the board and have students copy them. Pronounce each word and tell students to look for the words as they read the book. Point out that students should try to use context to learn what each word means.

Read the Book

Explain to students that this book is a fictional story with nonfiction information. Because of this there are story elements just as in other fiction stories. These elements are characters, settings, events, problems, resolution and an ending. Ask students to read and identify each of these categories in the book.

Revisit the Book

Have students work together to identify each story element in the book. Ask students to explain how they determined the meaning of each vocabulary word. Then ask these questions:

What does the author mean when Ms. Frizzle says, "We're getting to the root of the problem"?

What was the purpose of the class trip? What job do chloroplasts have in photosynthesis?

Why does the leaf look so textured?

How do plants get air and water?

What would happen if you cut all of the leaves off a plant?

Go back to problems and clues that students mentioned before reading the book, and clear up any remaining questions.

Extend the Lesson

WRITING

Challenge students to insert information about plants into the traditional story of "Jack and the Beanstalk." For example: Jack knew that his beans wouldn't grow unless he watered them.

SCIENCE

To demonstrate the work of photosynthesis, have students experiment with two houseplants. Students should put one plant in a window with sunlight and water. They should put the other plant in a closet or dark spot, but they should water it on the same schedule. Have students predict what will happen. After a couple of weeks, have them explain why the plant without light died.

VOCABULARY

Ask students to use each of the vocabulary words in a sentence that one of the Magic School Bus characters might say. Have students exchange papers with a partner to see if they used the words correctly.

READ ALOUD



Peanuts

By Claire Llewellyn

Book Features

Genre: Nonfiction

Levels: DRA™—18-20; GRL—K

Format: 32 pages, informational text, photographs, glossary, index

Vocabulary: sow, combine harvester, vitamin, energy, minerals, protein, stir-fry

Summary

In this *What's for Lunch?* book, students learn how peanuts are grown and harvested. The book also explains that peanuts are not really nuts. It tells why peanuts are nutritious and mentions different ways that peanuts are used.

FYI

Access information on George Washington Carver to use in introducing the book to students.

Materials

Blackline master: Growing Peanuts, p. 72
Variety of peanuts (unsalted, salted, honey roasted, boiled, etc.)

North Carolina Standard Course of Study Objectives

Science: 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction.

Language Arts: 1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary through discussion. 2.02 Interact with the text before, during, and after reading, listening, or viewing by making predictions and asking questions. 2.08 Listen actively by asking questions to gain additional information and ideas.

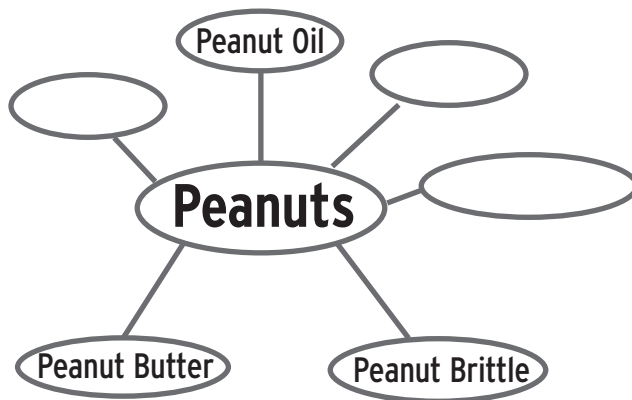
Cognition: Vocabulary in context

Interpretation: Make inferences, draw conclusions



Introduce the Book

Display the book and ask students to name things that are made from peanuts. Write their ideas in a web on the board. Then tell students that one man used peanuts to make more than 300 things. His name was George Washington Carver, and he was born a slave in the 1860s. Mention a few things Carver made from peanuts such as bread and ink. Tell students that they will learn more about peanuts from the book.



Read the Book

As you come to vocabulary words, stop and write them on the board. Help students by asking questions such as: *Can you show me what energy is? How can you figure out what the word sow means?*

Use think alouds and other strategies as you read. For example:

I wonder how a flower can grow underground? (page 10)

Why do farmers dig up peanuts and let them dry in the sun? What would happen if they didn't let them dry? (page 13)

Reread the first sentence on the page and ask: *Could you buy a peanut, plant it, and grow a peanut plant?* (page 16)

How could the workers determine if a peanut is good or not? (page 18)

Which kind of peanuts would you like the best? (page 21)

Revisit the Book

Provide students with copies of the blackline master, Growing Peanuts on page 72. Ask students to number the steps so they are in the correct order. As an additional challenge, have students turn their papers over and list three steps that happen in the factory. (Answers to BLM: 1 – c; 2 – b; 3 – e; 4-h; 5-i; 6-f; 7-a; 8-j; 9-g; 10-d)

Extend the Lesson

✍ WRITING

Ask students to research the life of George Washington Carver. Then have them write brief biographies of this important scientist.

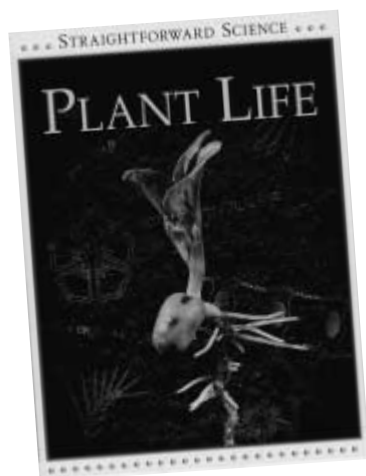
🔬 SCIENCE

Have a selection of peanuts that are prepared in different ways available: unsalted, salted, roasted, honey-covered, boiled, etc. Have students sample the peanuts. (Be sure to ask about peanut allergies beforehand.) Then ask students to identify the different types of peanuts by taste and sort them into groups.

1+2 MATH

Have students take a survey to find out what everyone's favorite type of peanut is. Students can then tally the results and make pictographs. Suggest that they use a peanut picture for each vote on their graph.

READ ALOUD



Plant Life

By Peter Riley

Book Features

Genre: Nonfiction

Levels: DRA™–34-38; GRL–O; Lexile® Measure–880L

Format: 32 pages, informational text, table of contents, photographs, illustrations, diagrams, glossary, index, activities

Vocabulary: conifer, algae, moss, fern, chlorophyll, photosynthesis, stamen, ovary, style, carpel, pollination, stigma, fertilization, embryo, tuber

Summary

This *Straightforward Science* book provides a solid introduction to plant life. The text is broken up into easy-to-read spreads with subheads and clear photographs, illustrations, and diagrams to guide readers.

FYI

Have on hand the materials students will need to complete the Investigate! activities found on pages 9, 11, 14, 17, 19, 21, 25, and 29. You might also want to make available different types of plants for students to observe as you read the book.

Materials

Lima beans, knife
Index cards

North Carolina Standard Course of Study Objectives

Science: 1.01 Observe and measure how the quantities and qualities of nutrients, light, and water in the environment affect plant growth. 1.05 Observe and discuss how bees pollinate flowers. 1.06 Observe, describe and record properties of germinating seeds.

Language Arts: 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text, making predictions, and asking questions. 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine fact and opinion.

Cognition: Text features, book parts

Interpretation: Make inferences, summarize



Introduce the Book

Preview the book with students. Point out that it is part of a series called *Straightforward Science*. Ask students what *straightforward* means, then have them explain how that might apply to the book. Look over the book's format with the class, and remind students that the page headings, subheads, photographs, diagrams, and captions are there to make it easier for readers to gain information. You might also draw attention to the index and model how to use it.

Write the vocabulary words on the board and pronounce each one for students. Point out that students can find many of these words in the glossary on pages 30 and 31 of the book.

Read the Book

Have students follow along as you read the book. Pose these questions as you work through each spread:

What is the most common type of plant? (pages 4-5)

What are the two main parts of a flowering plant? (pages 6-7)

How do cells help a plant? (pages 8-9)

What are some things a plant needs to make food? (pages 10-11)

What is pollen? (pages 12-13)

How do insects help plants? (pages 14-15)

What does fertilization do? (pages 16-17)

What is one way that seeds travel? (pages 18-19)

What is a seed? (pages 20-21)

What is another word for the growth of a seed? (pages 22-23)

What do potatoes grow from? (pages 24-25)

What is an annual plant? (pages 26-27)

Why are plants important? (pages 28-29)

Revisit the Book

To help students review what they have read, have them do the Investigate! activities on pages 9, 11, 14, 17, 19, 21, 25, and 29. Some of these can be done in the classroom while others might be assigned as homework.

Extend the Lesson

SCIENCE

Have students soak lima beans in water overnight. The next day demonstrate how to pull off the seed coating, and then cut the beans in half lengthwise. Have students observe the interior part of the bean and bean embryo.

VOCABULARY

Assign each student three of the vocabulary words. Have students look up the meanings of their words and write a sentence using each one. Ask students to write their words on one side of an index card and the definition on the other side. Then have students work with a partner to quiz one another on the words.

WRITING

Have students work with a partner. Assign each team one of the spreads in the book and ask students to write a short summary—two or three sentences—of the pages. Remind students to use the main heading and first sentence as guides.

GUIDED READING



The Reason For a Flower

By Ruth Heller

Book Features

Genre: Informational picture and poetry book

Levels: DRA™–34-38; GRL–P

Format: 48 pages, rhyming text, illustrations

Vocabulary: anther, stamen, angiosperm, herbivorous, carnivorous, parasite, rafflesia, prehistoric

Summary

Told in lilting rhymes with beautiful illustrations, this book explains the necessity of flowers. Readers follow the rollicking text that forms shapes of its own among the flowering plants that cover each page.

FYI

Materials

Dandelions with seed heads, burrs,
maple spinners

Blackline master: Our State Flower, p. 73

Introduce the Book

Have students take a picture walk through the book. Discuss the different shapes and locations of the text. Ask: *What would be the author's purpose in arranging the text this way?* Help students understand that the text is really a poem, and sometimes poets do arrange words in specific patterns.

Assign each student a vocabulary word. Have students locate their word in the text and use context clues to discover the meaning of the word. Students can then share their findings with the group.

North Carolina Standard Course of Study Objectives

Science: 1.05 Observe and discuss how bees pollinate flowers.

Language Arts: 1.06 Read independently daily from self-selected materials to increase fluency. 2.01 Use metacognitive strategies to comprehend text (reread). 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine the author's purpose. 2.05 Draw conclusions, make generalizations, and gather support by referencing the text.

Cognition: Text features, rhythm and rhyme

Critical Stance: Author's purpose



Read the Book

Read the book aloud to students so they can hear the rhythms and rhymes. Then have partners read the book together. Encourage students to read the book several times to improve their fluency with the lines. Ask students to make a list of rhyming words from the text.

Revisit the Book

To ensure comprehension, ask questions such as:

1. *In the poem, the word carnivorous means...?*
2. *What is one reason for a flower?*
3. *According to the information in the text, are humans herbivorous or carnivorous?*
4. *What is one way seeds travel?*
5. *What are three characteristics of the Rafflesia?*
6. *Name a flower that might have been eaten by a dinosaur.*
7. *What are some products made from flowers?*
8. *What was the author's purpose in writing this book?*

Extend the Lesson

SCIENCE

Show students a sample of different kinds of seeds such as dandelion plants that have seed heads on top, burrs, and maple spinners. Have students blow the dandelions to see how wind can disperse seeds. Ask students how they think other kinds of seeds get dispersed. Have students brainstorm ideas.

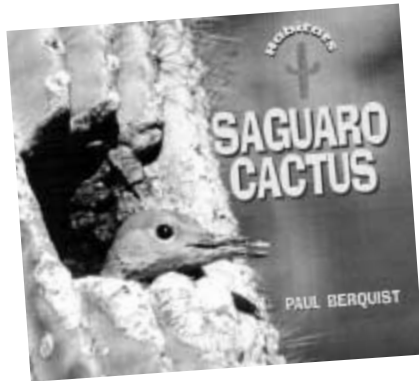
WRITING

Remind students that the book is in rhyme. Ask them to look at the lists of rhyming words they compiled while reading the book. These include: *bees/these, more/before/explore, breeze/bees/sneeze, style/while, weeds/seeds, cover/another, odd/pod, wide/ride, like/bike, shoe/do, burrs/furs, anywhere/air, leaves/trees, wet/yet, wheat/eat/treat/meat, herbivorous/carnivorous, found/ground, parasite/tight, four/more/odor, name/fame, agree/belfamily, angiosperm/term, few/you, become/plum*. Have students write their own rhyming poems about flowers using words from their lists along with others that they think of. Compile the flower poems into a class book and have students illustrate it.

SOCIAL STUDIES

Tell students that every state in the U.S. has an official flower. Provide copies of the blackline master, *Our State Flower* on page 73 and have students find the flower for your state in an encyclopedia or state website. Instruct students to complete the page.

GUIDED READING



Saguaro Cactus

By Paul and Shirley Berquist

Book Features

Genre: Nonfiction

Levels: DRA™—30; GRL—N; Lexile® Measure—840L

Format: 30 pages, informational text, photographs

Vocabulary: habitat, mesquite, nectar, starling, prey, teeming, javelina

Summary

This book is one in a series called *Habitats*. It provides a detailed look at the growing process of a saguaro cactus and the habitat it creates for desert animals. Stunning photographs enhance the text.

FYI

Materials

Sticky notes

Mural paper, paints

Large paper block letters, one for each student's first name, crayons, paste

Masking tape, copy of the chart shown at right

Life of Saguaro Cactus

Age	Height
1 year	4 inches
20 years	1 foot
25 years	2 feet
50 years	10 feet
60 years	18 feet
75 years	50 feet

Introduce the Book

Draw a word web on the board and leave the center circle blank. In the surrounding

North Carolina Standard Course of Study Objectives

Science: 1.02 Observe and describe how environmental conditions determine how well plants survive and grow in a particular environment. 1.03 Investigate and describe how plants pass through distinct stages in their life cycle including growth, survival, and reproduction.

Language Arts: 2.01 Use metacognitive strategies to comprehend text. 4.02 Use oral and written language to share information and ideas.

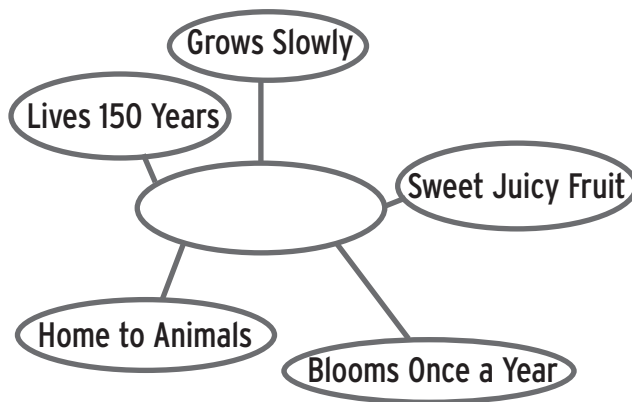
Cognition: Summarize main points

Interpretation: Draw conclusions

Critical Stance: Reflect on own reading



circles write these words: *Grows Slowly, Sweet Juicy Fruit, Blooms Once a Year, Lives 150 Years, Home to Animals*. Challenge students to figure out what words go in the center circle of the web. (Saguaro Cactus) When students guess correctly, display the book and tell them they will be reading about the saguaro.



Read the Book

Introduce the vocabulary words, and tell students that they may be helpful in the following reading activity. As students read the book, have them try this double word strategy. For every two pages they read, students should pick two words that reflect their thoughts about the pages. Have students write the words on a sticky note to mark the pages.

Revisit the Book

Number pieces of paper to correspond with the pages in the book. Then have students stick their word notes on the appropriate pages. Lead students in using the words to summarize the book.

Extend the Lesson

1+2 MATH

Take students to a playground or gym. You'll need a copy of the chart you made and masking tape. Have students refer to the chart, and then mark the ground with masking tape to show the height of the saguaro at different times in its life. Investigate questions such as: *How many students lying head to toe would it take to reach the top of a 60-year-old saguaro?*

SCIENCE

Using this book, along with others about the desert and the saguaro cactus (*Cactus Hotel*, *Desert Giant*), have students work in teams to plan and paint a mural of life in the Sonoran Desert. You might assign groups to research the different animals in the desert, the various kinds of cacti, and other plants and trees. Students might invite other classes in to view the finished mural. Suggest that students plan talks explaining the mural to visitors.

✍ WRITING

Give each student a large paper letter representing the initial of his or her first name. (Hint: You might use an overhead projector to enlarge block letters that come with bulletin board displays.) Have students research desert plants and animals that begin with their letter and either cut out pictures or draw them. Students can then paste their pictures on the letter and add labels. Display this decorative desert alphabet around the room.

READ ALOUD



The Magic School Bus Meets the Rot Squad

Adapted by Linda Beech

Book Features

Genre: Informational Fiction

Levels: DRA™—34-38; GRL—P; Lexile® Measure—470L

Format: 32 pages, narrative text, illustrations, speech balloons, chart

Vocabulary: termites, slimy, fungus, stunningly, stupendous, decomposition, renewal, gremlins

Summary

Adapted from the Magic School Bus television show, this book is a humorous and informative story about decomposition. Ms. Frizzle takes her students into an exciting world of dirt and decomposing things to explain how rotting nature creates food, shelter, and nutrients for living things.

FYI

Write each vocabulary word on a different index card. Make sure each student gets a card.

Materials

Grapes, safety pins, paper, lettuce leaves, ballpoint pens

Popsicle sticks, shoeboxes, pieces of plastic
Soil

Blackline master: Rot or Not, p. 74

North Carolina Standard Course of Study Objectives

Science: 2.05 Determine how composting can be used to recycle discarded plant and animal material.

Language Arts: 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text, making predictions, and asking questions. 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine cause and effect.

Cognition: Preview

Interpretation: Make predictions, cause and effect, figurative language



Introduce the Book

Preview the book title and ask questions such as: *What is a “rot squad”? Does the word rot have to do with rotten? What would rotten things have to do with the Magic School Bus?* Have students study the front cover and then make predictions about the book’s content.

Give each student an index card with a vocabulary word. Review all the words and discuss their meanings. Ask students to listen for these words in the story and to signal by raising their card when they hear their word.

Read the Book

While reading the text, focus on cause and effect relationships such as:

1. *What was the result of Wanda’s rotten subject?*
2. *What caused Ms. Frizzle’s class to get on the bus?*
3. *What caused Ms. Frizzle to shrink the bus?*
4. *What effect do mushrooms have on a log?*
5. *What causes Arnold to hand out badges?*
6. *What effect did the students have on Larry?*

Revisit the Book

Discuss these questions with the class:

1. *How did Wanda’s goal change from the beginning of the book to the end?*
2. *What is the purpose of this book?*
3. *What does it mean when Ralphie’s rotten orange gets “two nose holds and a faint?”*
4. *Why did the author use a song to help explain decomposition?*

Extend the Lesson

SCIENCE

The class could take a nature hike with the purpose of looking for their own examples of decomposition.

Have students work in small groups and try the project at the end of the book. Provide each group with the blackline master, Rot or Not on page 74 and the materials needed for the experiment. Have students meet in several weeks to report on their observations.

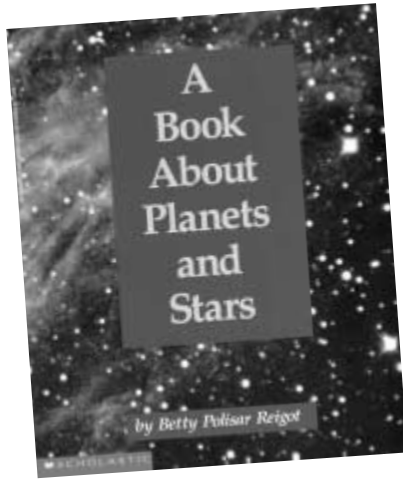
WRITING

Review the song that Arnold and Keesha sing about rot. Then invite students to create their own rot squad lyrics about the processes of decomposition. Set aside time for students to share their verses.

SOCIAL STUDIES

Point out that in the book, the students decide to leave the vacant lot as it is. Mention that in many communities empty lots are used for many different purposes such as building sites, parks, community gardens, and parking lots. Ask students to look for vacant lots in their neighborhood and the larger community. Have them predict what these lots will eventually become.

GUIDED READING



A Book About Planets and Stars

By Betty Polisar Reigot

Book Features

Genre: Nonfiction

Levels: DRA™–32; GRL–O; Lexile® Measure–760L

Format: 48 pages, informational text, photographs, table of contents, diagrams

Vocabulary: gravitational, carbon dioxide, magnetosphere, geyser, astrophysicists, thermonuclear, Fahrenheit, Celsius

Summary

This book offers an in-depth look at our solar system and the bodies that are a part of it. Readers also learn about how stars are formed and what happens when they eventually die.

FYI

Make a large copy of this table to use with the Vocabulary activity after reading the book.

Name	Number of Zeroes
Million	6
Billion	9
Trillion	12
Quadrillion	15
Quintillion	18
Sextillion	21
Septillion	24
Octillion	27
Nonillion	30
Decillion	33

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts: 1.01 Apply phonics and structural analysis to decode words. 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text, making predictions, and asking questions. 3.05 Analyze, compare and contrast printed and visual information.

Cognition: Text features

Interpretation: Make predictions

Critical Stance: Compare and contrast



Introduce the Book

Use the questions on the back book cover to engage students in thinking about the solar system. Flip through the book, pointing out interesting photographs and drawing attention to text features such as captions, headings, and sub headings.

Introduce the vocabulary words and discuss features such as root words, suffixes and/or prefixes. Point out that words such as *Fahrenheit* and *Celsius* are capitalized because they come from the names of the people who developed these temperature scales.

Read the Book

After reading each section of the book, have students pause and turn to a partner to do one of the following:

1. Make a prediction.
2. Pose an “I wonder” question.
3. Make a statement about a piece of information in the section.

Revisit the Book

Have students work with partners to compare planets using Venn diagrams. Assign two planets, or other bodies, to each team. Ask students to create several questions based on their finished diagrams.

Extend the Lesson

WRITING

Students might write reports based on the following prompt: *If I lived on the planet...*

After choosing a planet, ask students to include factual information about weather, temperature, size, and physical surroundings in their reports. Have students exchange reports with each other so they can learn more about each planet.

1+2 MATH

Using the chart on pages 26 and 27, have students calculate the distances between planets and the distance of each planet from Earth. You can also pose multiplication problems by asking questions such as: *How many Earth days does it take Mercury to spin three times on its axis? How many Earth days does Mercury take to orbit around the sun three times?*

VOCABULARY

Remind students that galaxies such as the Milky Way have millions and billions of stars. Display the chart you made and explain that each word means a thousand times more than the one before; for example, a thousand millions is a billion. Challenge students to identify things that such large numbers might represent. Possible ideas would include populations, insects, and years since the dinosaurs died out.

GUIDED READING



Can You Hear a Shout in Space?

By Melvin and Gilda Berger

Book Features

Genre: Nonfiction

Levels: DRA™—34-38; GRL—NR; Lexile® Measure—770L

Format: 48 pages, question and answer format, photographs, illustrations, table of contents, introduction, diagrams, index

Vocabulary: external fuel tank, national, shuttle, soil, panel, payload, weightlessness, flybys, satellite, lunar rover

Summary

In this informational book readers collect fascinating facts as they learn the answers to 80 questions about space exploration. The book helps students understand how space exploration has affected their lives.

FYI

Materials

Large sticky notes, poster paper

Blackline master: Questions, Please, p. 75

Balloons, one per student

Introduce the Book

Ask students to write on a large sticky note a question they would like to have answered about space. Attach the sticky notes to a large sheet of poster paper. Then display the book and invite students to take a picture walk. Point out that the text includes the answers to 80 important questions about space; some of the questions students wrote will be answered.

Write the vocabulary words on the board. Read through them with the class. Ask: *What consonant do you see and hear in all of these words?* (L) Call on volunteers to underline in each word the letters that make up the sound. Point out that the letter/sound appears at the beginning of words, in the middle of words, and at the end of words.

North Carolina Standard Course of Study Objectives

Science: 3.01 Observe that light travels in a straight line until it strikes an object and is reflected and/or absorbed.

Language Arts: 1.01 Apply phonics and structural analysis to decode words. 2.07 Explain choice of reading materials congruent with purposes.

Cognition: Locate specific information

Interpretation: Write answers in own words

Connections: Text to self



Read the Book

Have students look for answers to their questions as they read, and have them write (in their own words) any answers they find on their corresponding sticky notes.

Revisit the Book

Pose questions such as: *What was the authors' purpose in writing this book? What are some things you learned that you didn't know before? How does space exploration affect all of us?*

Provide copies of the blackline master, Questions, Please on page 75. Explain that this page gives answers to some of the questions in the book. Challenge students to find and write (in their own words) the questions.

Extend the Lesson

SCIENCE

Pass out balloons so that students can simulate how a rocket works. (See the activity on page 7 in the book.) Have students experiment with ways of making their balloon rockets go farther.

WRITING

Give students the sentence beginning, *If I were an astronaut...* and have them use it as the first line in a paragraph. Suggest that students base their paragraphs on information from the book. For example, students might write about what it's like to be weightless, to land on the moon, to train for space.

1+2 MATH

Model for students how to make up word problems using information in the book. Examples: *How long ago was the Columbia launch? (See page 18) If the space shuttle goes 32 miles in 2 minutes, how far did it go in 1 minute? (Page 21) If you went into space, approximately how tall would you be? (Page 22)*

SOCIAL STUDIES

Ask students to look for articles in the news about space exploration. Have students bring these to share in class. Create a bulletin board display on the topic and include the news stories.

GUIDED READING



Constellations

By Paul P. Sipiera

Book Features

Genre: Nonfiction

Levels: DRA™—30; GRL—N; Lexile® Measure—760L

Format: 47 pages, photographs

Vocabulary: constellation, astronomer, equator, mythology, planetarium, zodiac

Summary

A great book for beginning stargazers, *Constellations* traces the origins of constellations from ancient times to today. Photos and diagrams of the more common constellations are included, as are tips on how to identify stars in the night sky, and learning how their locations change throughout the year. Of particular interest is the section on how ancient people used the position of the stars to tell direction and record time.

FYI

Read the book beforehand as there are many names of stars and constellations that may be unfamiliar to you.

Gather additional resources on the topic of stars as students will most likely be motivated to do further research.

Introduce the Book

Ask the students if anyone knows what a constellation is. Explain that a constellation is a group of stars that form a shape or a pattern.

Then ask if anyone has looked at the stars before, and if so, did they use a telescope. Encourage students to each write an “I wonder” statement about stars (such as, “I wonder how many stars there are?”) that they would like to have answered.

Introduce the vocabulary words. Have students practice scanning the text for each word. Read aloud the sentence containing the word. Think aloud how you would figure out what the word means. Use strategies such as context clues, word structure, the glossary, or a dictionary.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts: 2.02 Interact with the text before, during and after reading, listening, and viewing by asking questions. 2.05 Draw conclusions, make generalizations, and gather support by referencing the text.

Interpretation: Draw conclusions

Connections: Text to world



Assign each group member a chapter to preview. After previewing have them share the most interesting photograph or illustration they found in their chapter. Start a discussion about each one, such as: *Why do you think the author included this in the book? How does it help you understand the text?*

Read the Book

Explain that while reading, good readers have to draw conclusions about what they are reading. The author tells you some things you need to know, and you have to be a “reading detective” to figure out the rest. You use the author’s words and your own knowledge and common sense to figure things out. Model how to do this in the first chapter.

Have students read page 5 and stop. Say: *I know that on a cloudy night the clouds block the view of the stars. That’s why the author says, “On a clear night you can see hundreds of pinpoints of light called stars.”* Have students read page 6 and look at the illustrations on page 7. Say: *I can draw a conclusion that it is easier to see a constellation in a planetarium, because the stars in the constellation are made brighter.* Have students read pages 8 and 9 and say: *I draw the conclusion that ancient people used constellations to remember things because they didn’t have paper or pencils to record them.*

Guide students through Chapters 2 and 3 to help them draw conclusions. Have them work with a partner in Chapter 4 to draw conclusions. Then have them work individually on Chapter 5 to draw conclusions.

Revisit the Book

Talk about how questions often start with the words *who, what, when, where, how, and why*. Give students an example of each type of question. Assign each student a different “question word,” and have them come up with a question based on information in the text. Then have each student quiz the rest of the group and challenge them to find the answer in the book.

Extend the Lesson

WRITING

Have students look at the diagram of constellations. Encourage them to create their own picture with that group of stars and write a story to go along with the picture.

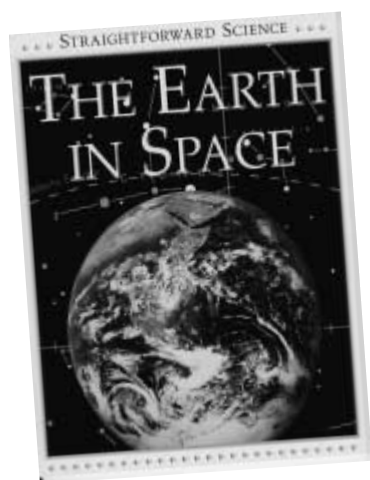
SCIENCE

For an at-home activity, ask the students to go outside at night with their parents to view the stars and try to identify any constellations. Encourage students to share with their parents what they have learned about constellations.

SOCIAL STUDIES

Have students choose one of the groups of people mentioned in the book: Greeks, Ancient Egyptians, Africans, Chinese, or Native Americans, and research two or three constellations that were important to them and explain why. Suggest that students draw diagrams of the constellations and write a brief description of each. They may wish to present their findings to the class and then create a display of constellations from different cultures together.

READ ALOUD



The Earth In Space

By Peter Riley

Book Features

Genre: Nonfiction

Levels: DRA™—34-38; GRL—P; Lexile® Measure—830L

Format: 32 pages, informational text, table of contents, photographs, diagrams, activities, glossary, index

Vocabulary: ammonia, asteroid, axis, black hole, carbon dioxide, comet, constellation, crater, equator, gravity, helium, hydrogen, meteor, meteorite, methane, nebula, volcano

Summary

This *Straightforward Science* book focuses on space and the various objects found there. The book covers the planets, stars, sun, and moon, as well as some investigations of space. It includes simple activities for students to try.

FYI

Preview the book beforehand and collect materials for any of the Investigate! activities that you plan to do in class. For example, the activity on page 25 calls for small stones and sand.

Materials

World map or globe

Introduce the Book

Prepare an anticipation guide such as the one shown here. You might want to include a statement based on each spread in the book. Read aloud the statements, and ask students to number a paper and write YES or NO to show agreement or disagreement with each statement. Tell students to check their responses as you read *The Earth in Space* and correct any misconceptions they had.

Agree or Disagree	Statement
	1. Space begins 1,000 miles above Earth.
	2. Stars are balls of gas.
	3. The sun is a star.

North Carolina Standard Course of Study Objectives

Science: 3.01 Observe that light travels in a straight line until it strikes an object and is reflected and/or absorbed. 3.02 Observe that objects in the sky have patterns of movement including sun, moon, stars. 3.03 Using shadows, follow and record the apparent movement of the sun in the sky during the day. 3.05 Observe and record the change in the apparent shape of the moon from day to day over several months and describe the pattern of changes.

Language Arts: 2.06 Summarize main idea(s) from written or spoken texts using succinct language.

Cognition: Main Idea

Interpretation: Draw conclusions



Read the Book

As you read aloud, have students follow along. Model for the first few pages what the main idea of a paragraph is. Point out that it is often contained in the first sentence. Explain that you can combine facts into one sentence to express a main idea. Help students identify supporting details for the main ideas. Eventually you can call on volunteers to identify main ideas and details.

Review and discuss the vocabulary words. Draw attention to the glossary at the back of the book.

Stop and have students carry out the Investigate! activities that are classroom appropriate. Assign others for homework.

Revisit the Book

Draw a circle on the chalkboard to represent the center of a flower, and add a few petals around it. Tell students that the main idea goes in the center of the flower and supporting details go in the petals. Have students draw their own flowers and write in a main idea and supporting details for a paragraph in the book. Ask questions to help students:

What is the main purpose of this paragraph?

Tell me in one sentence what this paragraph was about.

What is the most important idea from this passage?

Extend the Lesson

SCIENCE

Do a physical re-enactment of a solar eclipse with the class. Have one student be the sun, another be the moon, and the rest of the class gather together in a small circle to represent the Earth. Talk about how as the moon orbits the Earth, it sometimes blocks the sun. Explain that this is called a solar eclipse. Have students act out the solar eclipse. You might also do a lunar eclipse. This is when the sun, Earth, and moon are lined up, and the light from the sun is blocked by the Earth, so people can't see the moon.

WRITING

Have students choose a planet or another body in space and write a short research report. Remind students to include a main idea and supporting details in each paragraph that they write.

VOCABULARY

Assign each student two vocabulary words from the book. Tell students that they must use their words at least three times during the day. Have students write down the sentences in which they used the words.

SOCIAL STUDIES

Trace the equator on a globe or world map with students. Have students name the countries through which this imaginary line runs. Talk about why the equator is always pointing towards the sun.

READ ALOUD



The Magic School Bus Lost in the Solar System

By Joanna Cole and Bruce Degen

Book Features

Genre: Informational Fiction

Levels: DRA™—34-38; GRL—P; Lexile® Measure—480L

Format: 40 pages, narrative text, comic book style illustrations, reports, speech balloons, diagrams, charts

Vocabulary: asteroids, rotation, gravity, astronauts, sulfuric acid, compartment, atmosphere

Summary

This humorous and informative book is part of the *Magic School Bus* science series. The story focuses on a class field trip through the solar system. Under the “weird” guidance of their teacher Ms. Frizzle, students visit the moon, sun, planets, and some asteroids.

FYI

Materials

Drawing paper, crayons

Chart paper

Introduce the Book

Activate prior knowledge by asking if any students know the components of the solar system (sun, nine planets, moons, asteroids, comets). Have students work with a partner to talk about the topic. Each partner has one minute to tell the other anything he or she knows. Build background by explaining that Ms. Frizzle is a teacher who is a little different. She takes her students on wild field trips so they can experience science. Ask for a prediction about where Ms. Frizzle’s class will be going this time. Set a purpose during reading by asking students to write down three things they hope to learn from the book.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts: 1.03 Integrate prior experiences and all sources of information in the text when reading orally and silently. 2.08 Listen actively by asking questions to clarify the message. 3.01 Respond to fiction, nonfiction, poetry, and drama using interpretive, critical, and evaluative processes by relating plot, setting, and characters to own experiences and ideas.

Cognition: Text features

Interpretation: Draw conclusions

Critical Stance: Make observations of text

Connections: Text to self



Read the Book

If students are not already familiar with the *Magic School Bus* series, draw attention to the unusual format and the various text features. Read the main text first, the speech bubble conversations second, and the reports third. Show the illustrations and point out to the class that when you read informational text, you need to be sure to read all of it (captions, diagrams, labels, maps, speech bubbles, etc.) so that you can get the whole meaning. Encourage students to comment and ask questions. As you read, model reading and vocabulary strategies by thinking out loud. For example: *I can figure out that this word means _____ by ... I didn't really get the meaning the first time, so I reread the page. If I think about what I've read so far, I know that...*

Revisit the Book

Have students form a circle. Go around the circle and ask students to take turns telling about a connection they made between this book and another book, about their own life, the world, an observation (something they noticed or something they figured out), or a wondering (a question or "I wonder" statement).

Extend the Lesson

SCIENCE

Have the class make a solar system model like the one on page 4. Encourage students to be as realistic as possible when creating the planets by observing color, size, and other features. NOTE: For a more ambitious project, students could pattern their model on page 37 of the book.

1+2 MATH

Draw attention to the illustrations throughout the book that show scales with the comparative weights of someone on Earth versus the other planets and the moon. Have students extrapolate this information to create tables on chart paper. Working with a partner, students can then ask one another questions. For example: *On which planet would you weigh the most? Would you weigh more on Uranus or Pluto? How much more would an 85-pound person weigh on Earth than on the moon?*

WRITING

Students might write their own comic strip stories about an unusual trip on a school bus. Beforehand brainstorm possible topics with the class.

VOCABULARY

Using words from this book as a starting point, have students begin to compile a list of space words. For each word students should write a dictionary definition, a sentence from the book in which the word appears, and their own sentence using the word.

GUIDED READING



The Magic School Bus Sees Stars

Adapted by Nancy White

Book Features

Genre: Informational Fiction

Levels: DRA™—34-38; GRL—P; Lexile® Measure—580L

Format: 32 pages, narrative text, illustrations, speech balloons

Vocabulary: stellar, cruising, swirling, telescope, supernovas, mission, shuttle

Summary

Adapted from the Magic School Bus television show, this book presents factual information about stars in a fictional setting. Ms. Frizzle takes the class on a field trip into space to star shop and gain knowledge of stars along the way.

FYI

Materials

Constellation map

Foil stars

Black construction paper

White pencils

Introduce the Book

Write the book title on the board and ask: *What does it mean when someone “Sees Stars?”* Help students understand that the title is a play on words. Someone might actually see stars in the sky at night, while someone else is said to “see stars” after hitting his or her head. Ask students which meaning they think the book title refers to. Have students explain their thinking (the illustration on the cover, familiarity with the Magic School Bus books, etc.).

Introduce and review each of the vocabulary words. Ask students if they would expect to find a word such as *sneakapeekatron* in a dictionary. Have students predict what this word might mean.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine the author’s purpose. 3.03 Use text and own experiences to verify facts, concepts, and ideas.

Cognition: Locate specific information

Critical Stance: Compare and contrast



Read the Book

Explain to students that a book like this has nonfiction information but fictional characters. Ask: *What else in the book is fictional? Could a teacher take a class of students to the stars on a bus? Why do you think the books in this series use a magic school bus?* Have students compare this book to another that they have read on the same subject; for example, *A Book About Planets and Stars*.

Revisit the Book

Pose the following questions for students to answer. Ask them to tell if each refers to a nonfiction or fictional element of the book. Have students identify the place in the book that contains the answer.

1. *Are all stars alike?*
2. *What kind of shopping are the students in Ms. Frizzle's class doing?*
3. *Where does the story take place?*
4. *What is the purpose of a sneakapeekatron?*
5. *What are stars made of?*
6. *What are supernovas?*

Extend the Lesson

WRITING

Assign students to write reports on one of two famous supergiants, either Betelgeuse or Rigel. Students should include information such as where the stars are found, their color, size, other features, etc.

SCIENCE

Give students a map of star constellations and some foil stars. Have students place the foil stars on sheets of black construction paper to create a constellation. Students can then exchange papers with a partner and try to identify one another's constellation. Later students can connect the stars with white pencil to make the constellations clearer.

SOCIAL STUDIES

Ask students if they have ever heard of the North Star. Help them find it on the constellation map—it is at the tip of the handle in the Little Dipper in the constellation Ursa Minor (Little Bear). Tell students that another name for this star is Polaris. Have students investigate how different people have used this star throughout history. For example, ask: *Why is the North Star important to astronauts and sailors? How did escaping slaves use the North Star in the 1800s?*

GUIDED READING



The Moon

By Carmen Bredeson

Book Features

Genre: Nonfiction

Levels: DRA™—14; GRL—H; Lexile® Measure—560L

Format: 32 pages, informational text, photographs, glossary, index

Vocabulary: volcanoes, crescent, craters, astronaut, gushed

Summary

This fact-filled *Rookie Read About Science* book contains information about how the moon moves in space, how its craters were formed, why it seems to shine, and how humans have been able to walk on its surface.

FYI

Materials

Drawing paper, photograph of moon, markers

Muslim and Jewish lunar calendars

Introduce the Book

Make a K-W-L chart (*What We Know; What We Want to Know; What We Learned*) on the board. Have students offer information that they already know about the moon and list this in the first column. Ask students what they hope to learn and write these questions in the second column. Tell students that you will fill in the last column after reading the book.

Have students preview the book and review the words at the end. Discuss other words that may be unfamiliar.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars. 3.05 Observe and record the change in the apparent shape of the moon from day to day over several months and describe the pattern of changes.

Language Arts: 2.02 Interact with the text before, during, and after reading, listening, or viewing by setting a purpose, previewing the text, asking questions, and making connections. 2.06 Summarize main ideas from written or spoken texts using succinct language.

Cognition: Set purpose, summarize

Connections: Text to world, text to self



Read the Book

As students read, ask questions such as:

1. *What causes the moon to look like it has a face?*
2. *How did the moon form?*
3. *What causes craters on the moon?*
4. *How does the moon get light?*
5. *Why does the moon seem to change shape?*
6. *Why was 1969 an important year in the moon's history?*
7. *What conditions did the astronauts on the moon have to overcome?*
8. *Why did the astronauts bring rock from the moon back to Earth?*

Revisit the Book

Return to the K-W-L chart to add information to the “L” column. If students have a lot of additional questions, make a fourth column on the chart titled *What Else We Want to Know*. Have students do independent research to complete this column. Encourage group discussion with prompts such as: *I thought it was interesting that... I didn't know that... I learned... I'm confused about...*

Extend the Lesson



TECHNOLOGY

Have students visit the website: <http://nssdc.gsfc.nasa.gov/planetary/planets/moonpage> to learn more about the moon. Students might create a large moon web with a photograph

of the moon in the middle and facts about it written in colored markers in the surrounding circles.

WRITING

Ask students if they've ever noticed the “man in the moon.” Suggest that they write a speech that this imaginary man might give to a third grade class about the moon.



SOCIAL STUDIES

Tell students that when astronauts went to the moon, they lived in a very small cabin on a spacecraft. Have students help you rope off an area of the classroom to approximate a spacecraft cabin. Then invite groups of five students to work in this area. Discuss what it would be like to spend a long period of time in such a confined space. Ask: *What kinds of problems might you have? Why would it be important to solve these problems? What kind of rules or guidelines might you need?*

1+2 MATH

Display pages 15 and then 16 in the book. Tell students that throughout history people have used the phases of the moon as a way to measure time. Explain that people in Muslim countries still use a calendar with 354 days and 12 lunar months. Likewise, the dates of religious holidays in the Jewish faith are established with a lunar calendar. Have students compare these calendars to a Gregorian calendar in your classroom.

GUIDED READING



Postcards from Pluto

By Loreen Leedy

Book Features

Genre: Nonfiction

Levels: DRA™—34-38; GRL—P; Lexile® Measure—490L

Format: 32 pages, text in different forms on postcards, illustrations

Vocabulary: asteroids, rotates, orbits, blotches, galaxy, suffocate, craters, meteor, canyons, kilometers

Summary

This original approach to presenting the solar system gives interesting facts and details as if written by students who are visiting the sun, planets, and other bodies in space. Each postcard reflects a student's style: some are in rebus form, some have poems, still others offer clues and pose questions.

FYI

Materials

Index cards

Sticky notes

Blackline master: Fact or Opinion?, p. 76

Blank postal cards

Introduce the Book

Elicit prior knowledge by asking students: *Have you ever received a postcard from someone on vacation? What sort of information is on a postcard?*

Explain that the book they will be reading has characteristics of two genres. It is a fictional story with a scientific premise about children who visit the solar system and then send postcards home. However the postcards give factual, or nonfiction, information about what the students learn on their visits.

To introduce the vocabulary, give each student an index card. Have students fold the index card in half width-wise. Assign each student a vocabulary word. Students should

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts: 2.02 Interact with the text before, during, and after reading, listening, or viewing by setting a purpose. 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine the point of view and fact and opinion. 2.05 Draw conclusions, make generalizations, and gather support by referencing the text.

Cognition: Point of view

Interpretation: Fact and opinion



write the word on the outside of the card, a definition on one side of the inside, and an illustration of the word on the other side of the inside. Then have students share the words, definitions, and illustrations.

Read the Book

Point out that since the book is both fiction and nonfiction, it would be easy to include opinions along with the factual information, because each postcard is written from someone's point of view. Discuss how when a book is written from a character's point of view, that is called writing in the first person. Tell students that as they read, their task is to find opinions and mark them with a sticky note. Give examples of fact and opinion. For example: Fact—The moon has no light of its own, but it reflects sunlight like a mirror can. Opinion—Wish you were here!

Revisit the Book

Ask students to share the opinions they noted, and justify why these statements are opinions. Discuss students' reasoning. To reinforce this skill have students complete the blackline master, Fact or Opinion? on page 76.

After reading, ask comprehension questions such as:

1. *How many planets are smaller than Earth?*
2. *Based on the information you read, could a person survive on Mercury? Explain.*
3. *Why is Earth the only planet that can support human life?*
4. *Would you weigh more or less on the moon than on Earth?*
5. *If your spaceship hits the ring around Saturn, would it explode? Why?*
6. *What would happen if an asteroid hit Earth? (Make a prediction.)*

Extend the Lesson

SCIENCE

Write down the planets' names on index cards (one name per card). Hand them out to students, and instruct them to line up in the order of their distance to the sun; you can be the sun. Go to a playground or gym and have students stay in their own orbit path as they orbit around you. Discuss how since Mercury is the closest to the sun, it takes the least amount of time to orbit.

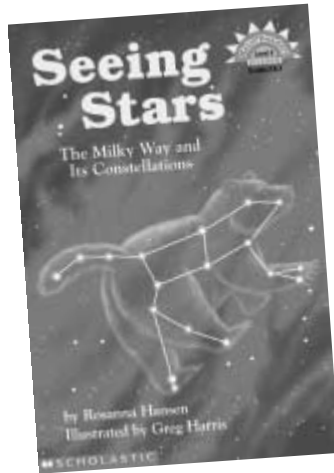
WRITING

Point out that the students in the book wrote their postcards in different styles. Ask: *Who used a rebus format? Who asked questions and offered clues? Who wrote poems?* Pass out postcards and tell students to imagine they have traveled somewhere in the solar system. Have them choose a style in which to write a card to a family member or friend about their trip. Set aside time for students to read their finished postcards to the class.

TECHNOLOGY

By accessing this website from the National Air and Space Museum, students can learn more about the planets: www.nasm.si.edu/etp. Encourage them to download and share information.

GUIDED READING



Seeing Stars

By Rosanna Hansen

Book Features

Genre: Nonfiction

Levels: DRA™—30; GR—N; Lexile® Measure—660L

Format: 40 pages, informational text, illustrations

Vocabulary: constellations, galaxy, astronomers, atomic, elliptical, universe, trillion, ancient, asteroids

Summary

This *Hello Reader Science* book tells how our solar system fits into the Milky Way galaxy. Readers also learn the stories behind some constellations and the seasons in which these stars appear.

FYI

Materials

Calendar

Paper with a grid for making a calendar

Introduce the Book

Model how to preview a nonfiction book by reading the title, looking through the pages for illustrations, reading the chapter titles, and noting words in italics. Have students practice previewing with *Seeing Stars*. Stop and discuss what each preview reveals about the book.

Introduce the vocabulary words. Have students work with partners to look up definitions. Then ask students to write a sentence, draw a picture, or act to demonstrate the meaning of each word.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts: 1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary through word study, listening, discussion, and role play. 4.01 Read aloud grade-appropriate text with fluency, comprehension, and expression.

Cognition: Main idea and supporting details

Interpretation: Text to world



Read the Book

Explain that it is helpful to look for main ideas when reading nonfiction. Remind students that the main idea is the big idea (the main thing) that the author wants readers to know. Details tell more about the main idea. As students read, point out that for informational text, it is a good idea to read at a slower pace than usual; that way readers can think about what they are learning. Remind students to use the illustrations to help understand the text, to make connections with what they already know, and to re-read parts they don't understand. Suggest that students pause after each page and review the main idea and details.

Use these questions as discussion points, written work, or assessment:

1. *What is the main idea of chapter 2?*
2. *What is the definition of constellation?*
3. *What is the main purpose of chapter 3?*
4. *What experience would most likely help you understand this book?*

Revisit the Book

Instruct students to choose one of the constellation stories in the book to read to a partner. Suggest that students practice reading their story beforehand to increase fluency. Listening partners should then summarize the story they have heard.

Extend the Lesson

1+2 MATH

Challenge students to write these numerals from the book as word names and the word names as numerals.

Numerals	Word Names
3,000	four
600,000	one hundred billion
30,000	a hundred
95,000	seven
4 1/2	two hundred fifty million
88	twenty-five trillion

✍ WRITING

Ask students to imagine that they have just discovered a star. Have students decide what they will name the star, and then write an explanation of the name and why they chose it. Set aside time for students to read about their star names to the class.

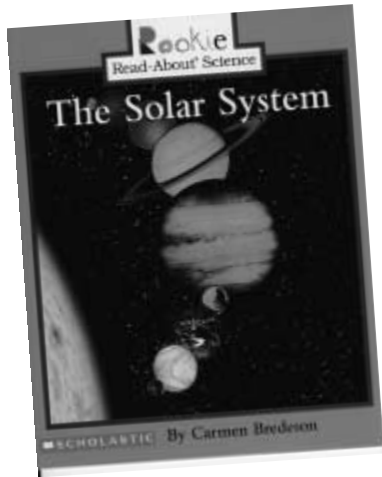
💻 TECHNOLOGY

To learn more about the constellations, students might access the National Air and Space Museum website at www.nasm.si.edu/etp.

🌐 SOCIAL STUDIES

Review how constellations once helped ancient farmers keep track of the seasons so they would know when to plant and harvest crops. Then have students work in four groups to make a calendar with a constellation theme. Assign each group a different season. Have students find at least three constellations for their season and use these as illustrations for the months in that season. Suggest that students think of other activities which are seasonal that students might incorporate into their calendars.

GUIDED READING



The Solar System

By Carmen Bredeson

Book Features

Genre: Nonfiction

Levels: DRA™—I 6; GRL—I; Lexile® Measure—490L

Format: 32 pages, informational text, photographs, glossary

Vocabulary: asteroids, meteoroids, solar

Summary

This *Rookie Read About Science* book is a basic introduction to the solar system. Students learn about comets, the sun, asteroids, and planets. Clear photographs accompany the text.

FYI

Materials

Blackline master: Planet Riddles, p. 77

Introduce the Book

Cover the book title and ask students to predict what the book will be about. Call on volunteers to tell something they know about space. Lead students into guessing the title of the book. Take a picture walk, allowing students to discuss each picture and to ask questions. Introduce the vocabulary and have students scan the book to find each word.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

Language Arts: 2.01 Use metacognitive strategies to comprehend text (paraphrase). 2.02 Interact with the text before, during, and after reading, listening, or viewing by previewing the text and locating information for specific purposes. 2.06 Summarize main idea(s) from written or spoken texts using succinct language.

Cognition: Summarize

Interpretation: Make predictions



Read the Book

As students read, ask them to write five questions based on the text. Explain that the questions shouldn't be easily answered by "yes" or "no" but should require some thinking. Model good questions such as:

Why is Mars red?

What kind of movement goes on in the solar system?

How do asteroids and meteoroids compare in size?

Revisit the Book

Have students exchange questions with a partner and answer one another's questions. Call on different teams to read aloud their questions and answers as a way of helping students to summarize what they have read.

Extend the Lesson

SCIENCE

Provide students with copies of the blackline master, Planet Riddles on page 77. Explain that most of the information is from the book, but students may need to do some research to answer all the riddles. Suggest that students consult other books in the library such as *A Book About Planets and Stars*, *Postcards from Pluto*, *The Earth in Space*, and *The Magic School Bus Lost in the Solar System*. When students have completed the page, let them take turns reading aloud the riddle they wrote, and have the class guess the answer.

WRITING

Review what students have learned about the planets. Then suggest that they invent a new planet. Have students write a description of this planet. Use prompts such as:

What is your planet's name?

What, if anything, grows on your planet? How is this possible?

Does anything else live on your planet?

How far from Earth is your planet? How far from the sun?

What else is special about this planet?

Encourage students to draw pictures of their planet to show the class while reading their descriptions aloud.

SOCIAL STUDIES

Tell students that the names of the planets come from stories of the Ancient Greek and Roman gods. Have students work with partners or in teams of three, and assign each group a planet name to research. Ask each group to make a poster showing their planet and the god, goddess, or other being it is named for.

GUIDED READING

Stargazers

By Gail Gibbons



Book Features

Genre: Nonfiction; informational picture book

Levels: DRA™–34-38; GRL–O; Lexile® Measure–640L

Format: 32 pages, informational text, illustrations, diagrams

Vocabulary: astronomer, atmosphere, galaxy, constellation, binoculars, telescope, reflection, magnifying

Summary

This informative picture book gives lots of information on stars, such as why stars twinkle, patterns of stars in constellations, and how to view stars. Readers also learn about the history of stargazing.

FYI

Beforehand make up a sentence for each vocabulary word, leaving a blank for students to fill in the word.

Materials

Index cards

Telescope

Zodiac chart, sample horoscope

Blackline master: How Many Stars?, p. 78

Calculators, scissors

Introduce the Book

Introduce the book by reading the title and author. Ask students to describe the action in the illustration on the cover. Ask if students have ever had a similar experience. Read the back cover. Suggest that students jot down a question they would like to have answered about stars.

Introduce the vocabulary by writing the words on the board broken into syllables. Have students read aloud each syllable, then blend them into the whole word. After you have repeated this process with each word, display the sentences with blanks that you prepared. Have students put the correct vocabulary word into each sentence. Read the completed sentences out loud.

gal ax y The Milky way is an example of
a _____.

North Carolina Standard Course of Study Objectives

Science: 3.02 Observe that objects in the sky have patterns of movement including the sun, moon, and stars.

3.06 Observe that patterns of stars in the sky stay the same, although they appear to move across the sky nightly.

Language Arts: 2.05 Draw conclusions, make generalizations, and gather support by referencing the text. 4.02 Use oral and written language to share information and ideas.

Cognition: Vocabulary in context

Interpretation: Make inferences



Read the Book

While students read, ask questions such as these to help them make inferences:

1. *If it is a cloudy night, would you be able to see stars?*
2. *Can you see stars while the sun is out?*
3. *Are all points of light in the sky stars?*
4. *If a star ran out of hot gas, would it shine?*
5. *Do all stargazers know a lot about stars?*
6. *Why would some stars look brighter than others?*
7. *If you were on the moon, would stars appear to twinkle?*
8. *Is the moon part of the Milky Way?*
9. *Have astronomers discovered everything there is to know about stars?*
10. *Why is the viewing room in a planetarium circular?*
11. *Why weren't photographs taken of stars before 1840?*
12. *Where is a satellite when it takes pictures?*

Make sure students explain and justify their answers.

Revisit the Book

Have students write a *who*, *what*, *where*, *when*, *why*, or *how* question about the book.

Students should write the question on the front side of an index card and their answer on the back. Have a “game show quiz” using students’ questions to review the book.

Extend the Lesson

SCIENCE

If possible, bring in a telescope for students to examine. Have students refer to the diagrams in the book. (A possible source might be a local astronomy club. Check to see if someone can come in to talk to your class.)

WRITING

Display a copy of a zodiac chart, and explain that the zodiac is the name for a band of stars that appear to circle Earth. Mention that historians think that the first constellations identified were the 12 signs of the zodiac. Have students determine under which sign their birthdate falls on the zodiac. Explain that many publications carry daily horoscopes based on the zodiac, which offer advice about topics such as money, luck, friendship, and love. Read a few examples to the class. Point out that not everyone takes these seriously, but they are fun to read. Then suggest that students try writing a horoscope of their own.

MATH

To help students understand how scientists estimate the number of stars there are, have students complete the blackline master, *How Many Stars?* on page 78.

GUIDED READING



Bones! All Kinds of Hands, All Kinds of Feet

By Rosanna Hansen

Book Features

Genre: Nonfiction

Levels: DRA™—18-20; GRL—K; Lexile® Measure—530L

Format: 40 pages, informational text, illustrations, diagrams

Vocabulary: concrete, skeleton, X-ray, anklebones, wrist, penguins, sloth, armadillo

Summary

This *Hello Reader Science* book introduces readers to the subject of bones. Students learn about bones in the human body, particularly those in the hands and feet. Readers then go on to find out about the bones in the hands and feet of various kinds of animals.

FYI

Make a large copy of this chart to use when revisiting the book with students.

Animal	Body Part	Use	Description
Human	Hand		
Penguin	Foot		
Sloth	Front leg		
Gibbon	Hand		

Materials

Roll of white craft paper, pencils, markers

North Carolina Standard Course of Study Objectives

Science: 4.01 Identify the skeleton as a system of the human body. 4.02 Describe several functions of bones including support, protections and locomotion.

Language Arts: 1.03 Integrate prior experiences and all sources of information in the text when reading orally and silently. 2.01 Use metacognitive strategies to comprehend text. 3.05 Analyze, compare and contrast printed and visual information.

Cognition: Vocabulary in context

Interpretation: Make predictions

Critical Stance: Compare and contrast

Connections: Text to self



Introduce the Book

Read the book title and show the cover to students. Ask them to predict what this selection will be about. Think aloud how you could make a prediction: *I read the title and it says “all kinds of hands and feet.” Then I looked at the pictures and I saw a person and some animals. That made me think the story will probably be about how humans’ and animals’ hands and feet are alike and different.*

Review and discuss the vocabulary words with the class. Write these sentences on the board and read them with students.

Chapter 1: In fact, they are four times stronger than concrete! Together, all of your bones make up your skeleton. X-rays are special pictures of your bones.

Chapter 2: Now wiggle your wrist. In each foot, you have seven anklebones, five foot bones, and 14 toe bones.

Chapter 3: Penguins have wings, too. The sloth has two big claws on each front leg and three on each back leg. The bones in the giant armadillo’s front legs are short, but powerful.

Read the Book

Take a picture walk through each chapter prior to reading it. To build vocabulary and fluency, utilize strategies such as choral reading, echo reading, and reading to a partner. Ask questions as you go through the book, and have students explain their answers. Encourage students to refer to the text. If students have trouble with a vocabulary word, have them reread the sentence on the board and then try again.

Revisit the Book

Introduce the chart you made beforehand. Have students look in the book to find information to fill in the chart. Then use the completed chart to have students make comparisons.

Extend the Lesson

SCIENCE

Assign students to work in small groups to draw a human skeleton on a large piece of craft paper. Ask students to label the different bones. For a more challenging assignment, you might have some groups draw the skeletons for the different animals in the book.

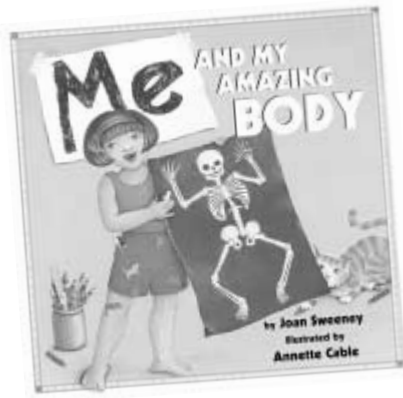
1+2 MATH

Remind students that the human body has 206 bones. Help students collect other numerical facts about bones and then create word problems to solve. For example: *If you have 7 anklebones, 5 foot bones, and 14 toe bones in each foot, how many bones are in one foot? How many bones are in both feet?*

WRITING

Students might write compare and contrast paragraphs in which they discuss the bones in a human hand or foot versus those of one of the animals covered in the book. Encourage students to do additional research for their paragraphs.

GUIDED READING



Me and My Amazing Body

By Joan Sweeney

Book Features

Genre: Nonfiction

Levels: DRA™—24-28; GRL—M; Lexile® Measure—710L

Format: 32 pages, informational text, illustrations, diagrams

Vocabulary: oxygen, nourishment, arteries, veins, energy

Summary

This book provides a playful introduction to anatomy. It explains all the important parts of the body, what the parts do, and why humans need them in order to live, breathe, work, and play.

FYI

Beforehand, draw a BDA (*Before, During, After*) Reading chart like the one shown here on poster paper.

Before	During	After

Materials

Craft paper, markers

Calculator

Poster paper

Introduce the Book

Start a discussion asking students what internal parts of the body they can name.

Ask: *Do you know how each part works?*

Record students' answers on the BDA chart in the "before" column. Then introduce the book.

Have students work with a partner to go through the book and list all the boldfaced words. Ask: *How do you know what these words mean?* Help students realize that they are defined in the text. Review the vocabulary words listed in this lesson as well.

North Carolina Standard Course of Study Objectives

Science: 4.01 Identify the skeleton as a system of the human body. 4.02 Describe several functions of bones including support, protection, and locomotion. 4.05 Observe and describe how muscles cause the body to move.

Language Arts: 1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary through word study. 2.05 Draw conclusions, make generalizations, and gather support by referencing the text. 3.06 Conduct research for assigned and self-selected projects from a variety of sources.

Interpretation: Draw conclusions

Connections: Text to self



Read the Book

Explain that as students read, they will be drawing conclusions. Review that when a reader draws a conclusion, the reader uses the author's information plus what he or she already knows to figure something out. To help students, pose questions such as:

1. *Why do you think skin covers your body?*
2. *If the outside (skin) of people can be different colors, is the inside different?*
3. *Why are your bones hard?*
4. *Why do you think your muscles stretch and shrink?*
5. *Why does the author call your brain "the boss" of your body?*
6. *Where does your blood get the energy to feed your body and brain?*
7. *Why does your heart keep beating even when you're asleep?*
8. *If your lungs fill like balloons when you breathe in, what would they be like when you breathe out?*
9. *If you ate only one type of food, what do you think would happen to your body?*

During reading, add information students learned to the middle column of the BDA chart.

Revisit the Book

Have each student pick a body part and do research to determine which body system it belongs to. Add students' information to the last column of the BDA chart. Tell students they must identify their information sources. Discuss the importance of verifying the accuracy of information.

Extend the Lesson

SCIENCE

Have students work with partners to draw a body outline on craft paper. One partner lies on the paper while the other traces around the outside of the body. Instruct students to draw the internal body parts on their outlines and label each one.

WRITING

Remind students that food provides the energy or fuel the body needs to run. Have students keep a food diary for a week. For each day they should write down what they ate for breakfast, lunch, dinner, and snacks. At the end of the week, discuss students' food intake and diet. Which foods help the body? Which foods can cause problems? How can students improve their diet?

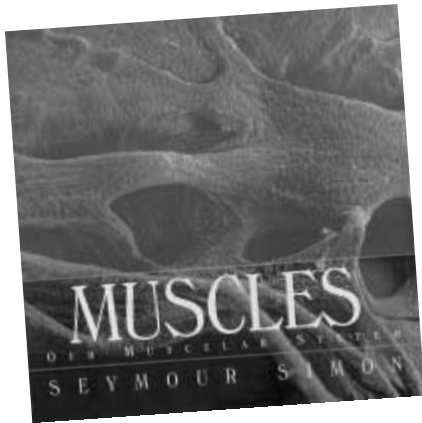
1+2 MATH

Use some of the amazing body facts from the book to create word problems. Students may need a calculator. Examples:

If one brain weighs 3 pounds, what is the total "brain weight" for your class?

If a stomach digests 2,190 quarts of food a year, how much food (in quarts) has each student digested in a lifetime?

READ ALOUD



Muscles

By Seymour Simon

Book Features

Genre: Nonfiction

Levels: DRA™—34-38; GRL—O; Lexile® Measure—1030L

Format: 32 pages, informational text, photographs, diagrams

Vocabulary: digestion, relaxes, electrical, consciously, intestines, cardiac, diaphragm, delicate, skeletal, tendon

Summary:

This book provides a close look at muscles in the human body. It discusses how muscles function, what they are made of, and how they enable people to move.

FYI

Materials

Stopwatch

Introduce the Book

Show students three different muscle movements such as making a fist, smiling, and flexing a foot. Ask: *What allows me to do these things?* Guide students to understand that you are using muscles for these actions. Display the book and have students take a

picture walk through it. Use the “photography note” located on the inside front cover to explain how the pictures were taken.

Introduce and define the vocabulary words. Tell students to listen for these words as the book is read.

Read the Book

Tell students that they will be “reading archeologists” who will “dig” through the book to uncover meaning. Give an example of “inferring” such as, “if the weather forecast is for snow and mom doesn’t wake you up in the morning, you might infer that school has been cancelled.” As you read, pose questions such as:

North Carolina Standard Course of Study Objectives

Science: 4.05 Observe and describe how muscles cause the body to move.

Language Arts: 1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary through word study. 2.02 Interact with the text before, during, and after reading, listening, or viewing by making connections. 2.05 Draw conclusions, make generalizations, and gather support by referencing the text.

Cognition: Word study

Interpretation: Make inferences

Connections: Text to self



1. *Why don't you control your heart muscle?*
2. *How do muscles help you show emotions?*
3. *Why are leg muscles the largest and strongest in your body?*
4. *What would happen if you didn't eat enough food?*
5. *Why does it look like body builders have more muscles?*

Revisit the Book

To review information in the book and develop vocabulary, have students complete the sentences using vocabulary words from the book. Some examples are:

1. A muscle that you control is a _____ muscle. (voluntary)
2. Stomach muscles aid in the _____ of food. (digestion)
3. Narrow, ropelike tissues called _____ hold muscles to your bones. (tendons)
4. You cannot _____ control involuntary muscles. (consciously)
5. The trunk of your body is called the _____. (torso)

Extend the Lesson

SCIENCE

Have students try this test to see how muscles can be affected by fatigue. Afterwards have students explain why rest is important for the body. Divide the class into pairs and assign one partner to be the timer and the other to be the subject. Provide a stopwatch

for the timers. Have the subjects put one arm on a desk or table with their palm up. At the word "Go," the subjects open and close their fist as many times as they can for 30 seconds. Model how to do this by closing your hand into a *tight* fist and then opening it completely with the fingers stretched wide. Tell the subjects to count the number of times they can do this during the 30 seconds. Have students repeat this test three times. Ask: *What happens to the number of times they can make fists? Why? What would happen if you did this test one more time? What would happen if the subjects had a chance to rest?*

WRITING

Students might write directions on performing simple exercises to develop muscles. Suggest that students illustrate their directions. Then compile the directions into a class exercise book.

1+2 MATH

Model for students how to take a pulse rate at the wrist or side of the neck. Then have students determine their at-rest breathing rates for one minute. Record these on a chart. Next have students spend a few minutes in vigorous exercise such as jumping in place. Have students take their pulse rates again and compare the results. Add the data to the chart. Repeat a few more times using a different exercise each time. Ask students to explain the increase in heart rate each time. Ask: *What is happening to the heart muscle?*

GUIDED READING

Outside and Inside You

By Sandra Markle



Book Features

Genre: Nonfiction

Levels: DRA™—?; GRL—?; Lexile® Measure—730L

Format: 40 pages, informational text, photographs, diagrams, glossary/index

Vocabulary: cartilage, enamel, intestine, retina, larynx, saliva, villi

Summary

This book discusses the many parts of the human body, their purposes, and what might happen without them. Color enhanced and magnified photographs add to readers' understanding. The text also includes tips on caring for the body and staying healthy.

FYI

Materials

Saltines, paper towels

Introduce the Book

Elicit prior knowledge with questions such as:

What enables you to stand up? (Bones, muscles)

Why can you solve a math problem? (Use your brain)

How do you know what foods you like? (Because of how they taste)

Introduce the book and explain that the photographs of the body are magnified. Have students turn to the glossary/index on pages 35 through 38, and read over the words listed there.

North Carolina Standard Course of Study Objectives

Science: 4.01 Identify the skeleton as a system of the human body. 4.02 Describe several functions of bones including support, protection, and locomotion. 4.03 Describe the functions of different types of joints like the hinge, ball and socket, and gliding. 4.04 Describe how different kinds of joints allow movement and compare this to the movement of mechanical devices. 4.05 Observe and describe how muscles cause the body to move.

Language Arts: 1.04 Increase sight vocabulary, reading vocabulary, and writing vocabulary through discussion. 2.02 Interact with the text before, during, and after reading, listening, or viewing by setting a purpose and asking questions.

Interpretation: Cause and effect

Connections: Text to self



Read the Book

Write the following clues on the board, and ask students to read and find out what part of the human body each refers to:

1. Stretchy bodysuit (skin)
2. Tiny building blocks (cells)
3. Strong framework (skeleton)
4. Windows (pupils)
5. Talented muscle (tongue)
6. Message center (brain)
7. Kind of strainer (kidneys)
8. Holding bag (bladder)
9. Cell soup (blood)
10. Pump (heart)

Revisit the Book

Call on volunteers to identify the body part that each clue describes. Encourage students to think of their own clue for another body part. Have them take turns challenging the class to figure out their clue.

Extend the Lesson

SCIENCE

Pass out saltines and paper towels. Have students try the tongue drying experiment on page 21. Then explain that a person's sense of taste is greatly influenced by smell. Have students try eating a saltine while holding their nose. Ask: *Why does the saltine seem tasteless?*

VOCABULARY

Using the words at the end of the book along with others that they know, have students compile an ABC book about the human body. You might have students work with a partner and assign each team two or more letters. Instruct students to include a definition, part of speech, and sentence with their words. Students might also illustrate some words. Compile the finished pages into a class book leaving extra space for students to add more words as they learn them.

WRITING

Recall with students that the book says you are “a special, one-of-a-kind person from the inside out.” Have students write a paragraph or two describing the things that make them unique. Ask students to bring in a photograph of themselves to display with their written descriptions. Create a bulletin board of your unique class.

GUIDED READING



The Search for the Missing Bones

By Eva Moore

Book Features

Genre: Informational Fiction

Levels: DRA™–34-38; GRL–P; Lexile® Measure–550L

Format: 76 pages, chapter book, narrative text, illustrations, reports, diagrams

Vocabulary: ligaments, vertebrates, collagen, calcium phosphate, cranium, tibia, fibula, sternum, vertebrates

Summary

This chapter book is based on the *Magic School Bus* books. In this story, Ms. Frizzle and her students take a field trip to find the missing bones for their skeleton costumes. Along the way, readers learn about the different bones in the human body.

FYI

Materials

Picture of a skeleton

Prepare a chart like the one shown here.

Examples of a hinge, universal joint, and ball-and-socket joint from a hardware store

Joint Name	Hinge Joint	Universal Joint	Ball-and-Socket Joint
Fingers			
Shoulder			
Knee			
Neck			
Toes			
Knuckles			

North Carolina Standard Course of Study Objectives

Science: 4.02 Describe several functions of bones including support, protection, and locomotion.

Language Arts: 2.02 Interact with the text before, during, and after reading, listening, or viewing by making predictions. 2.03 Read a variety of texts, including fiction.

Cognition: Text features

Interpretation: Make predictions



Introduce the Book

Build background knowledge by asking questions such as: *Have you read other Magic School Bus books? Why does Ms. Frizzle take her class on field trips?*

Write the vocabulary words on the board and ask students what they have in common. Help students conclude that they all relate to bones. Tell students they will be reading a book about the bones in the human body.

Read the Book

Before reading each chapter, have students make predictions about its content. Students might use the illustrations and other graphic material as an aid. Confirm or revise students' predictions at the end of the chapter.

Revisit the Text

Use a picture of a skeleton to identify the different bones in the body and to review the vocabulary words.

Draw attention to the puns involving the word *bone*. Have students explain what each one means. For example: Get down to bare bones, no bones about it, we have a bone to pick with you.

Extend the Lesson

WRITING

Challenge students to write more verses to the song about the ghost of John on page 10. Students might lead the class in singing these verses.

Have students review the contents of each chapter in the book, and then write a good chapter title for each. Remind students that the title should in some way summarize the chapter contents.

SCIENCE

Display an example of a hinge joint, a universal joint, and a ball-and-socket joint from a hardware store. Tell students that they represent most of the joints in the human body. Encourage students to handle the joints and discover the range of motion in each. Ask them to describe how each joint works. Then have students locate some of the major bones in their bodies such as the *tibia*, *patella*, *femur*, and *mandible*. Have students move the body part so they can locate the nearest joint. Display the Joint Chart and have students tell what kind of joint they think each body part is. (*Hinge*: fingers, knee, toes; *Universal*: neck; *Ball-and-Socket*: shoulder, knuckles)

SOCIAL STUDIES

Talk with the class about the different types of clothing and equipment that people wear to protect their bones in sports and certain kinds of jobs. For example, many athletes wear helmets; goalkeepers wear masks.

GUIDED READING



Skeletons! Skeletons! All About Bones

By Katy Hall

Book Features

Genre: Nonfiction

Levels: DRA™—34–38; GRL—O; Lexile® Measure—630L

Format: 32 pages, informational text, cut paper illustrations

Vocabulary: cartilage, marrow, spine, vertebrae, ligament, inflate, exoskeleton, fossil, slither, unhinge, socket, breathe

Summary

In this delightful book students not only learn about the skeletons of different animals, but they also get a chance to engage with the text by figuring out riddles. Readers learn that the bones of each kind of animal are suited to the way it lives. Word play and cut paper illustrations add to the appeal of the text.

FYI

Materials

Uncooked chicken bones, white vinegar, jars

Introduce the Book

Write these words on the board and ask students what they might have in common: *socket, rib, joint, spine*. (If students need extra help, add the word *skull*.) Summarize by explaining that all the words refer to the skeletons of humans. Tell students they will be reading a book about different kinds of skeletons.

Write the vocabulary words on the board and discuss their meanings. Have students think of ways to sort these words. For example, some words have prefixes and others don't. Some words are nouns that name body parts, while other words are verbs that describe actions the body does.

North Carolina Standard Course of Study Objectives

Science: 4.02 Describe several functions of bones including support, protection, and locomotion.

Language Arts: 2.04 Identify and interpret elements of fiction and nonfiction and support by referencing the text to determine the author's use of figurative language.

Cognition: Vocabulary in context

Critical Stance: Author's purpose

Interpretation: Make predictions, draw conclusions



Read the Book

As students read the book, pose these questions:

1. *Why do babies have more bones than adults?*
2. *How are your bones different from a dinosaur's bones?*
3. *Why is it important that your jawbone moves?*
4. *How is your spinal cord like an electrical cord?*
5. *What part of your body is like a rubber band?*
6. *What's inside your rib cage?*
7. *What are joints?*
8. *What is an outside skeleton called?*
9. *Why does a python's jawbone unhinge?*
10. *Why are bird bones hollow?*
11. *Why is the snout area of a dog's skull large?*
12. *How do tails help animals?*

Revisit the Book

Have students team up with a partner to discuss and answer the “riddles” in the book. Instruct students to address the author’s word play as well. For example, why does the author say that the owl “doesn’t give a hoot about staying home at night”? Ask students to answer the question: *What is the author’s purpose in adding a guessing element to the book?*

Extend the Lesson

SCIENCE

To help students understand the necessity of minerals in bones, have them conduct this experiment using uncooked chicken bones,

white vinegar, and jars. Be sure the chicken bones are clean and dry. Have students place the bones in their jars, then add enough vinegar to cover them. Students should replace the jar lids and let the bones stand undisturbed for a week. Have students predict what will happen to the bones during this period. At the end of the week, tell students to remove the bones from the jars and wash them. Ask students to test the flexibility of the bones for the next few days. As students note that the bones become soft and rubbery, explain that the vinegar takes the minerals out of them. Help students conclude that minerals play an important role in keeping bones hard.

WRITING

Have students write a paragraph about their favorite bone. Provide criteria such as:

1. The paragraph must include the name of the bone.
2. The paragraph must include the bone’s function.
3. The paragraph must include the bone’s approximate size.
4. The paragraph must include any other details that distinguish the bone.

SOCIAL STUDIES

Recall with students that a skeleton gives a body its shape. A skeleton is a kind of framework. Ask students to find pictures of other frameworks such as the steel framework for a building or a car. Create a bulletin board display of different kinds of nonliving skeletons or frameworks.

Date: _____

Senses of the Desert

The phrases in the box are from the book *Desert Giant*. Write each phrase on the chart under the best heading to show the sense it suggests. (You may use a phrase under more than one heading.) Then add another phrase from the book for each sense.

sharp spines	tap... tap-tap	soft flesh of cactus
sweet, juicy pulp	moisture	fruit is ripening
pigs grunt and snort	revealing its bright red insides	a bee circles around
flapping of wings	moon shines in dark sky	drink the nectar

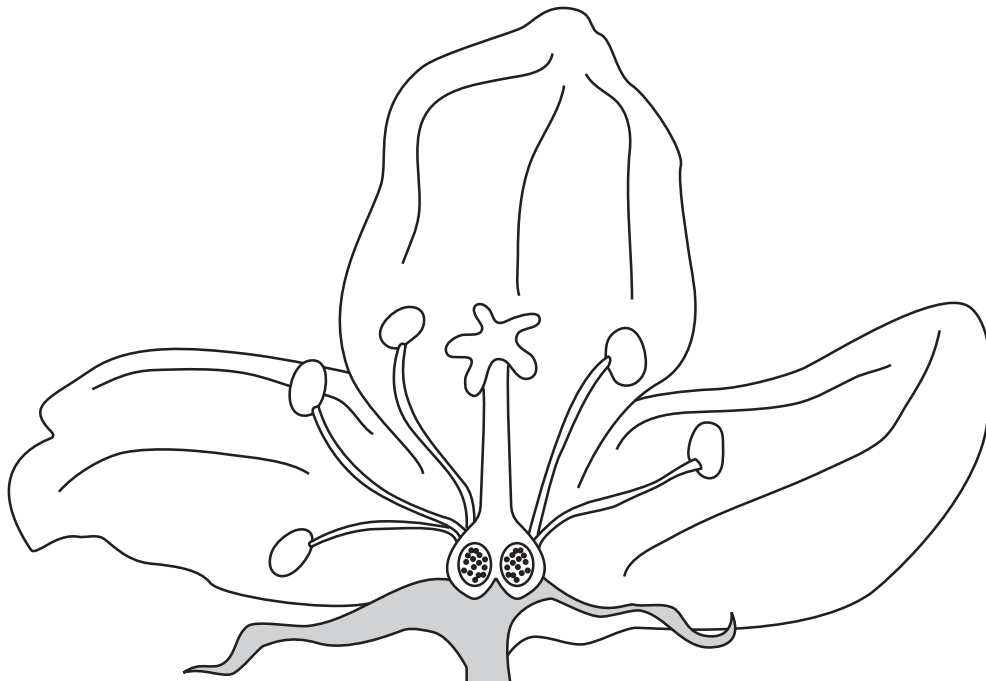
Sight	Sound	Smell	Touch	Taste

Name: _____ Date: _____

The Parts of a Flower

Use the words in the box to label the parts of the flower.

stigma	pollen	pistil	stamen
petal	sepal	ovules	stem



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Name: _____ Date: _____

Growing Peanuts

Number these steps so they show the order in which a peanut grows and goes to a factory.

a. After five months, farmers use machines to dig up the plants.

b. The seeds sprout into plants.

c. In the spring, farmers plant the peanut seeds in the ground.

d. The peanuts are packed into sacks and sent to factories.

e. The plants grow yellow flowers on pegs.

f. Peanuts begin to grow in the pods.

g. A combine harvester pulls the pods from the plants.

h. The pegs push their way down through the soil.

i. The flowers change into pods under the ground.

j. The pods are left to dry.

Name: _____ Date: _____

Our State Flower

Every state in the United States has an official flower.

Our state is _____.

Our state flower is _____.

<p>Our state flower looks like this:</p>	<p>Some interesting facts about our state flower are</p> <p>1. _____</p> <p>_____</p> <p>2. _____</p> <p>_____</p>
<p>Here is a picture of our state (fruit, tree, seaweed):</p>	<p>Some interesting facts about this plant are:</p> <p>1. _____</p> <p>_____</p> <p>2. _____</p> <p>_____</p>

Name: _____ Date: _____

Rot or Not

Use the chart to record your predictions and observations about how different things rot over time.

Materials	Our Predictions	First Observations Date	Second Observations Date
Grapes			
Safety pin			
Paper			
Lettuce leaf			
Ballpoint pen			

Name: _____ Date: _____

Questions, Please

On this page you'll find some answers. Use the book to help you write a good question for each answer.

1. Answer: You need a rocket.

Question: _____

2. Answer: Sputnik

Question: _____

3. Answer: Neil Armstrong

Question: _____

4. Answer: NASA

Question: _____

5. Answer: black

Question: _____

6. Answer: the Hubble Space Telescope

Question: _____

Name: _____ Date: _____

Fact or Opinion?

A **fact** is a statement that can be proved. An **opinion** is a statement of someone's beliefs or feelings. Read the sentences below and write Fact or Opinion to tell what each statement is.

- _____ 1. The asteroids form a ring around the sun.
- _____ 2. Venus looks scary on the surface.
- _____ 3. It's a good thing we sent a robot camera to film it.
- _____ 4. Mercury has the shortest year.
- _____ 5. This moonwalk is great!
- _____ 6. Sometimes there are dust storms on Mars.
- _____ 7. I don't think you should bother wearing helmets.
- _____ 8. Jupiter is made of gases and liquids that swirl around.
- _____ 9. Jupiter is the biggest planet.
- _____ 10. I think Saturn is the prettiest planet.

Name: _____ Date: _____

Planet Riddles

Read the riddles and then write the name of a planet to answer each one. Write your own riddle about another body in space for question 10.

_____ 1. I am one of the rocky planets. I am closest to the sun.

_____ 2. I am just right for living things. I have air and water.

_____ 3. I am the red planet. I have iron in my soil.

_____ 4. I am the farthest known planet from the sun. I am small.

_____ 5. I have beautiful rings. They are made of ice.

_____ 6. I am the biggest planet. I have 39 moons.

_____ 7. I am between Mercury and Earth. I have no moons.

_____ 8. I am a gas planet. One gas make me look blue.

_____ 9. I am the seventh planet from the sun. I look green from space.

10. _____

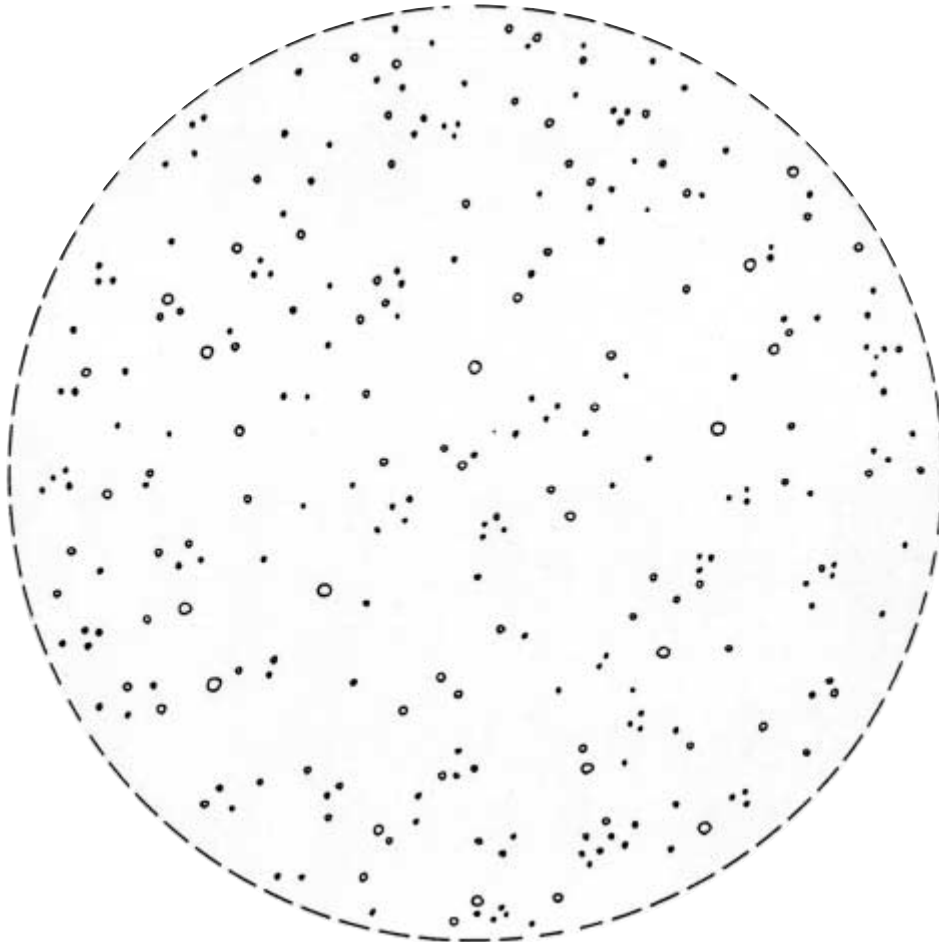
Name: _____ Date: _____

How Many Stars?

The picture shows stars that you might see through a telescope. However, there are too many to count. Scientists estimate, or guess, how many stars there are. You can try it too.

1. Cut out the circle on this page. Fold it in half so the stars show. Fold it in half again so the stars show.
2. Count the stars in the quarter of the circle that shows. Write the number here.

3. Multiply that number by 4. You can use a calculator. Write the total here. _____
4. Remember, this is an estimate. Can you explain why it is not the *exact* number of the stars? _____



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