TCM Teacher Created Materials

TIME FOR KIDS Nonfiction Readers

Lessons and Activities

Advanced

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TIME FOR KIDS

Nonfiction Readers

Advanced

Teacher's Guide

Teacher Created Materials

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Kit Components

Trio 1

Trio 2

Trio 3

Trio 4

Trio 5

Teacher's Guide

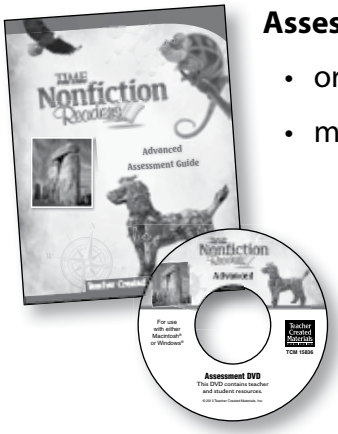
Easy-to-use, standards-based lesson plans

Digital Resource CD

- PDFs of books suitable for whiteboard use
- teacher resources
- student activity sheets

Audio CD

Professional recordings of books and poems



Assessment Guide

- oral reading records
- multiple-choice tests

Assessment DVD

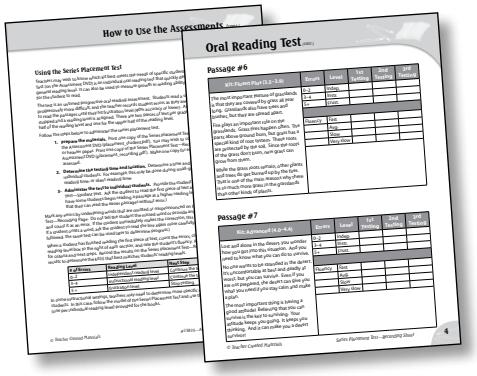
- placement test
- assessments in both electronic and printable form

Interactiv-eBooks Single Classroom Site License

Interactiv-ebooks with embedded audio, videos, and activities

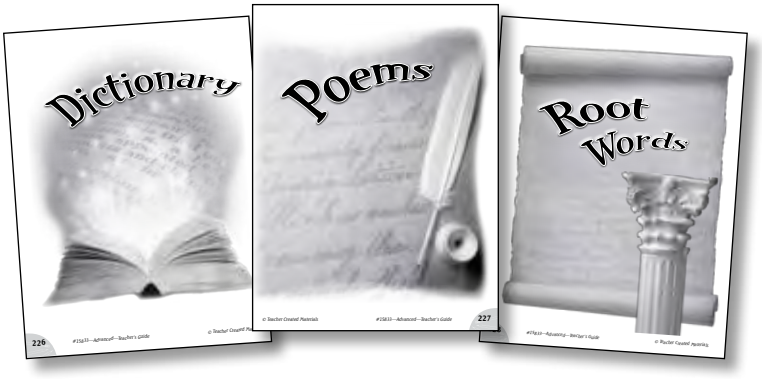
Getting Started

1. **Use the Series Placement Test.** Use the Series Placement Test (on the Assessment DVD) to determine which kit is most appropriate for students. For a complete overview of the placement test and directions for test administration, see page 7 of the Assessment Guide.



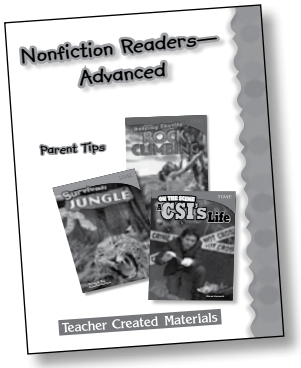
2. **Create reading groups.** If desired, place students in reading groups based on their reading levels or other instructional needs. See pages 29–30 for tips on using TIME For Kids *Nonfiction Readers* in a guided reading/ balanced literacy model.

3. **Prepare student resources.** As an option, create some student resources, including a personal dictionary and a poetry folder. These can be created with common classroom resources such as lined paper, construction paper, and spiral notebooks. See pages 226–228 (or the Digital Resource CD) for cover templates for these resources.



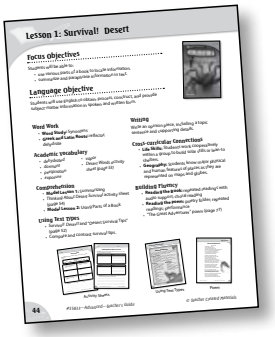
4. **Prepare assessment resources.** Depending on the amount of regular assessment planned, you may wish to create a simple assessment folder for each student. These folders can hold the student's placement test, oral reading records, multiple-choice tests, activity pages, and anecdotal records taken during the reading lessons.

5. **Make a home-school connection.** Send the Parent Tips booklet (found on the Digital Resource CD) home with students. The tips and activities in the booklet provide family members with the necessary tools to promote literacy development at home.

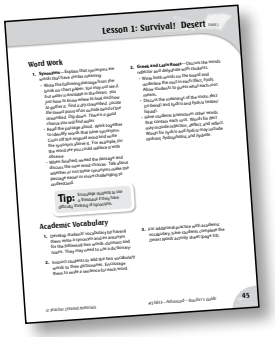


Teaching a Lesson

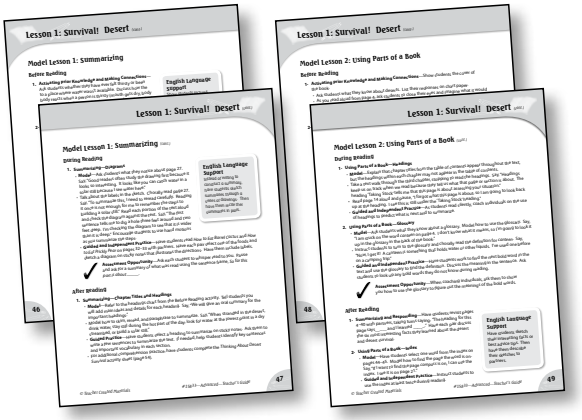
Each 11-page lesson is organized in a consistent format for ease of use. Teachers may choose to complete some or all of the lesson activities in order to best meet the needs of their students. The lesson begins with an overview page that provides key information for planning purposes.



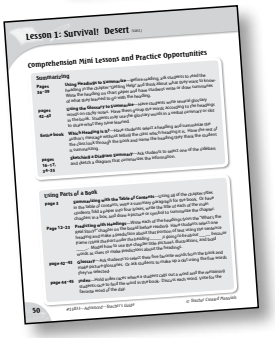
Lesson overview provides lesson objectives and key information for planning purposes.



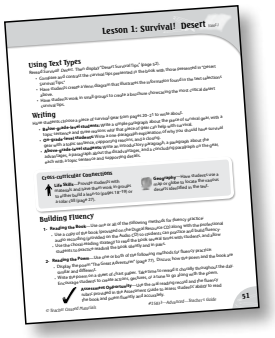
Word Work and Academic Vocabulary sections include activities and suggestions for teaching word patterns, parts of speech, Greek and Latin Roots, and key academic vocabulary.



Two Comprehension Model Lessons are carefully scaffolded and provide teacher modeling through think alouds as well as guided and independent practice opportunities for before, during, and after reading.

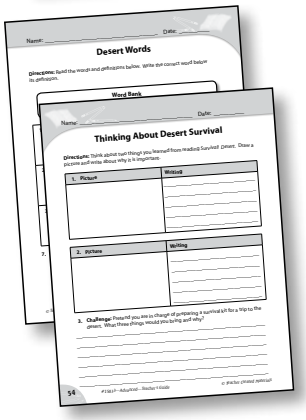


Comprehension Mini Lessons and Practice Opportunities provide teachers with simple and engaging activities that reinforce the comprehension skill addressed in the lesson.



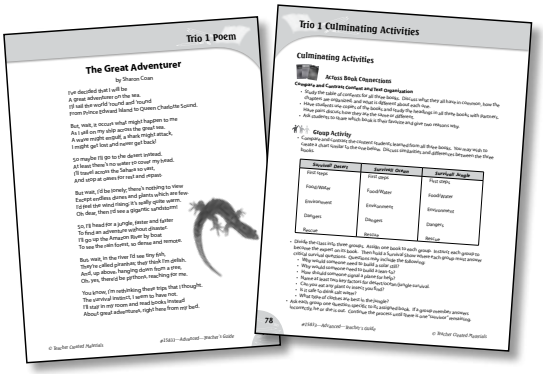
Using Text Types, Writing, Cross-curricular Connections, and Building Fluency sections offer additional activities for building comprehension and making connections.

Each lesson includes an **additional content-related text piece** (step-by-step instructions, primary sources, advertisements, magazine articles, etc.) to support comprehension. This text piece is used with the Using Text Type section of the lesson.



Student activity sheets can be used in a variety of ways to meet student's needs. They offer additional opportunities for practicing the skills addressed in the lesson.

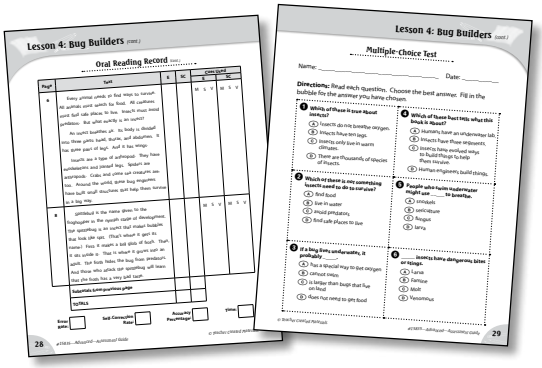
Using the Trio Resources



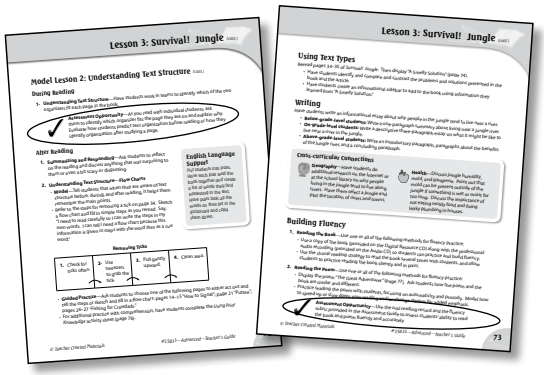
The fluency poem provided at the end of each trio provides a thematic connection to the book and can be used as a tool for building both content-area vocabulary and fluency. The Culminating Activities provide students with the opportunity to make across book connections and can be used as a tool for small-group interaction and for building comprehension.

Using Assessment Options

1. **Use formal assessments at the end of each lesson.** The oral reading record and multiple-choice comprehension test provided for each book offer opportunities to assess student learning and can be used to drive instruction. An overview of these assessments and the assessments themselves can be found in the Assessment Guide. The accompanying Assessment DVD offers two versions of the multiple-choice assessments: printable PDF form and electronic form, giving students the opportunity to take the test on the computer and print their results.



2. **Use informal assessments during each lesson.** Refer to the assessment tips embedded throughout the lessons to gather information about students' reading skills. Record anecdotal records as they meet the needs of your classroom.



Using Technology Options

1. **Use the Audio CD as a model of fluent reading.** The Audio CD includes professional recordings of the books and poems in this kit. Play the audio tracks of the books to support students as a prereading activity, during fluency practice, or in a listening center. Play the audio tracks of the poems as part of the poetry section of the lesson.

2. **Use the Interactiv-eBooks to enhance the reading experience.** This kit includes interactiv-ebooks that guide students toward independent reading and engage them in a fully interactive experience. Students can hear the text read aloud, view video clips, record their voices, and complete interactive activities that build academic skills—from word study and vocabulary to comprehension and writing. The interactiv-ebooks can be used in a variety of instructional settings and help support numerous literacy and learning goals. For a detailed overview of how to use the interactiv-ebooks in the classroom, see pages 40–41.

About the Books

TIME For Kids *Nonfiction Readers* is designed to enhance any reading program. Each book motivates students to *want* to read with high-interest content and engaging photographs. The authentic reading experiences help students develop vocabulary, comprehension, and fluency skills.

The books are grouped by reading levels. Advanced readers (levels 4.0 through 4.4) are designed for students in the first semester of grade four.

Level 4.0: *Survival! Desert*; *Survival! Ocean*; *Survival! Jungle*

Level 4.1: *Bug Builders; Animal Architects; Wild Cities*

Level 4.2: *In the Game: An Athlete's Life; On the Scene: A CSI's Life; Behind the Canvas: An Artist's Life*

Level 4.3: *Unsolved! Mysterious Events; Unsolved! Mysterious Places; Unsolved! History's Mysteries*

Level 4.4: *Defying Gravity! Rock Climbing; Hang Ten! Surfing; Final Lap! Go-Kart Racing*

Leveling Components

Each reading level offers a variety of specialized features, including the following:

- complex language and sentence structures
- challenging vocabulary
- graphic features to support visual literacy
- text features, such as a bibliography to extend reading, "More to Explore" to extend and support the content, a glossary, an index, and a table of contents
- interactive spreads to prompt critical thinking
- 48 pages for a robust reading experience
- a reduced trim size of 5.25 x 8 inches

Special Features in the Books

Each reader includes the following special features to enhance the reading experience:

Think Link

- Introduces main concepts.
- Poses three critical thinking questions or key points to encourage reading with a purpose.

Dig Deeper

- Provides background knowledge to access a deeper understanding.
- Offers a variety of text types, including instructions, maps, diagrams, and interviews.
- Provides high-interest graphics and interaction.

Stop! Think

- Poses additional critical thinking questions.
- Guides students in expanding their visual literacy and comprehension, using information from charts, graphs, and more.

Word Counts and Level Correlations

Advanced Title	Word Count	TCM Level	Guided Reading Level	Early Intervention Level	DRA Level	Lexile® Measure
Survival! Desert	1489	4.0	Q	24	40	700L
Survival! Ocean	1475	4.0	Q	24	40	710L
Survival! Jungle	1489	4.0	Q	24	40	750L
Bug Builders	1471	4.1	Q	24	40	710L
Animal Architects	1433	4.1	Q	24	40	740L
Wild Cities	1426	4.1	Q	24	40	680L
In the Game: An Athlete's Life	1427	4.2	Q	24	40	740L
On the Scene: A CSI's Life	1302	4.2	Q	24	40	690L
Behind the Canvas: An Artist's Life	1302	4.2	Q	24	40	660L
Unsolved! Mysterious Events	1474	4.3	R	25	40	720L
Unsolved! Mysterious Places	1380	4.3	R	25	40	680L
Unsolved! History's Mysteries	1499	4.3	R	25	40	690L
Defying Gravity! Rock Climbing	1445	4.4	R	25	40	750L
Hang Ten! Surfing	1480	4.4	R	25	40	760L
Final Lap! Go-Kart Racing	1420	4.4	R	25	40	730L

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Using TIME For Kids *Nonfiction Readers* in a Guided Reading/ Balanced Literacy Model

TIME For Kids *Nonfiction Readers* is a supplemental leveled reading program that can be flexibly implemented in a guided reading/balanced literacy model. The high-interest books provide an engaging reading experience, while supporting the development of important reading skills including comprehension, fluency, vocabulary, and word work. The comprehensive Teacher's Guide with step-by-step, scaffolded model lessons and student activities can be easily incorporated into any block of a balanced literacy model including large group, guided reading groups, literature circles, or independent work time. Multiple assessment opportunities will diagnose students' needs and help direct teachers as they plan for differentiation and inform their instruction as they move students toward mastery of key reading and writing skills.

Guided Reading

Two key features of TIME For Kids *Nonfiction Readers* allow it to be effectively used within a guided reading program. First, it can serve to target specific word-work skills. Second, the high-interest leveled books make them ideal selections for use with groups who need practice at certain reading levels and with general reading skills.

The Time For Kids *Nonfiction Readers* are ideal to use with small teacher-led guided reading groups. The high-interest leveled books make them ideal selections to use with readers who read at levels 4.0–4.4. Oral reading records for each book are included in the Assessment Guide (and in digital format on the Assessment DVD) so that teachers can monitor the progress of students as they increase their reading level. The chart on page 28 indicates the reading levels of the books included within this kit.

The easy-to-follow lesson plan offers a carefully scaffolded format that provides explicit teacher modeling through think alouds as well as guided practice to use with peers and independently (Oczkus 2009). Teachers may use the Time For Kids *Nonfiction Readers* in a variety of small group settings including guided reading groups and as an intervention with struggling readers.

Additionally, the strong word work and rich language support make Time For Kids *Nonfiction Readers* an excellent program to use with English Language Learners.

Lesson Plan Structure

The core of the guided reading lesson is organized around Before, During, and After Reading activities and suggestions. Each book targets two main strategies or skills (refer to page 229 for a complete list of the skills addressed in this kit). Each comprehension strategy lesson is carefully scaffolded using teacher modeling, guided practice, and independent practice. The lessons are designed to provide a rich menu for teachers to pick and choose from as they differentiate instruction for students. If needed, the lessons can also be used as a quick review or mini-lesson.

Targeting Leveled Practice and Other Reading Skills

Each book included in the TIME For Kids *Nonfiction Readers* program has been leveled for use in small groups of students with similar reading levels. In addition to teaching the specific comprehension skills students need to read nonfiction, the lesson plans for the Time For Kids *Nonfiction Readers* also include carefully crafted instruction in the following areas of literacy:

Word Work: Students study word patterns, parts of speech, and Greek and Latin roots.

Guided Reading *(cont.)*

Academic Vocabulary: Students study key academic vocabulary through the use of dictionaries, graphic organizers, drama, sketching, and glossary use. Many of the activities are appropriate for whole-class work in a vocabulary session focusing on activities suggested in the lesson plans for vocabulary development or for word-knowledge practice.

Fluency: Fluency lessons are based on reading the book, a poem, or other content-related text.

Writing: The lesson plan for each book includes a writing activity. Additionally, writing is integrated into the activity sheets. Depending on the level of the TIME For Kids *Nonfiction Readers* kit a teacher is using in the classroom, the writing activities vary from requiring students to write sentences to writing short stories as a way to apply the new skills they learn, or as a way to show comprehension of the story.

In addition to nonfiction reading skill development, as students move through the books in the program they will encounter carefully written content designed to provide practice with many other areas of literacy, such as word knowledge and increasingly complex sentence structures and text features.

Progress Monitoring

Assessment options are found directly in the lesson so that teachers can keep ongoing formative assessment records and adjust instruction accordingly. Oral reading records and comprehension checks are included to help provide further opportunities to monitor student progress. During the lessons frequent assessment checks and suggestions for observing students while reading offer concrete ways to inform instruction and chart student progress in the program. The activity sheets that accompany each lesson also provide assessment checks for the teacher. The informal and formal assessments are in easy-to-use formats.

Other Blocks of a Balanced Reading Program

Learning Centers and Independent Practice

One of the challenges of a guided reading program is making sure the students who are not in the small instructional group with which the teacher is currently working are constructively engaged. TIME For Kids *Nonfiction Readers* lesson plans provide ample suggestions and materials for independent student use and for the development of centers. For example, two high-interest activity sheets are included for each book. Students may complete these practice pages independently after reading the book.

Independent Reading

Students who spend more time reading independently outperform their peers on standardized tests and other measures. Time spent reading independently is the best predictor of reading achievement (Anderson, Wilson, & Fielding 1988). The books from the Time For Kids *Nonfiction Readers* series provide easy-to-read and high-interest content. They can be added to classroom libraries for independent reading selections.

Using Text Types

Intertextuality is the way that one text might draw on or resemble the characteristics of another, causing the reader of the texts to make links between them (Anstey and Bull 2006, 30). Students need to be able to integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. They also need to be able to analyze how two or more texts address similar themes or topics to build knowledge or to compare the approaches the authors take (National Governors Association Center for Best Practices and Council of Chief State School Officers 2010). Each book in this kit has an additional content-related text selection to support this key skill.

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Lesson 10: Unsolved! Mysterious Events

Focus Objectives

Students will be able to:

- establish a purpose for reading.
- understand structural patterns or organization in informational texts.

Language Objective

Students will use English to obtain, process, construct, and provide subject-matter information in spoken and written form.

Word Work

- **Word Study:** Shades of Meaning
- *Shades of Meaning* activity sheet (page 158)
- **Greek and Latin Roots:** *geoglyph*, *epicenter*

Academic Vocabulary

- *geoglyphs*
- *phenomena*
- *theory*
- *man-made*
- *hoaxes*

Comprehension

- **Model Lesson 1:** Establishing a Purpose
- *Establishing a Purpose* activity sheet (page 159)
- **Model Leson 2:** Understanding Text Structure

Using Text Types

- *Unsolved! Mysterious Events* (pages 34–35) and "The Tunguska Impact 100 Years Later" (page 157)
- Write a cause and effect summary about the Tunguska event.

Writing

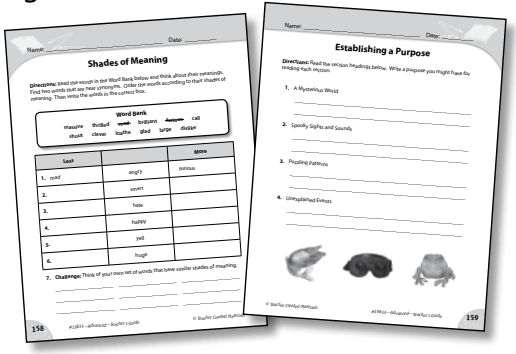
Write a media article about a mystery in your community.

Cross-curricular Connections

- **Geography:** Students know the location of major cities in North America.
- **Science:** Students know how the physical environment can impact personal health.

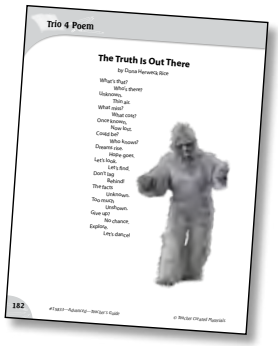
Building Fluency

- **Reading the Book:** repeated readings with audio support; choral reading
- **Reading the Poem:** poetry folder; repeated readings; performance
- "The Truth Is Out There" poem (page 182)



Activity Sheets

Using Text Types



Poem

Word Work

1. **Shades of Meaning**—Review the meaning of synonyms and antonyms.
   - Write the phrase *a massive tornado headed toward Joplin, Missouri* on the board and underline the word *massive*. Discuss synonyms for *massive*.
   - Explain that synonyms often don't have exactly the same meaning, but that the word you choose can reveal more descriptive detail.
   - Create a three-column chart. Label the first column *Less*, the second *Original Word,* and the third *More*. In the second column, write the word *massive* and then sort the other words that you come up with. For example, discuss where students would place the word *large* in relation to *massive*.
   - For additional practice with shades of meaning, have students complete the *Shades of Meaning* activity sheet (page 158).

Tip: If students struggle with understanding shades of meaning, design questions around personal interests.

2. **Greek and Latin Roots**—Discuss the words *geoglyph* and *epicenter* with students.
   - Write both words on the board and underline the root (geo) and prefix (-epi). Allow students to guess what each one means.
   - Discuss the meanings of *geo* (earth/soil) and *epi-* (on/upon).
   - Have students brainstorm additional words. Words for *geo* may include *geography*, *geology*, and *geode*. Words for *epi-* may include *epidemic, epilogue,* and *episode*.

Academic Vocabulary

1. Have students write a personal connection to one of the academic vocabulary words by using one of the following prompts: *Describe a time when you were involved in a hoax,* or *describe a theory that you have.*
2. Instruct students to add the two vocabulary words to their dictionaries.

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Model Lesson 1: Establishing a Purpose

Before Reading

1. **Establishing a Purpose**—Ask students to share reasons why they read nonfiction texts either online or in books. Explain that good readers often select nonfiction topics that interest them. Tell students that today they will have the opportunity to choose what interests them most in the book *Unsolved! Mysterious Events.*
   - Invite students to look through the entire text with partners. Have them review the table of contents, major headings, and pictures and illustrations.
   - Read pages 4–5 together. What do students already know about mysteries? Use the table of contents to discuss how the book is organized. Which chapter looks most interesting? Why?
   - **Model**—Tell students, "Good readers often read to answer the questions they have about a topic they are interested in."
   - Have students page through the book again and select one page or topic from pages that they are most interested in and tell why. List the topics students choose on chart paper.
   - Tell students they will be in charge of teaching their topic to the rest of the group after reading. Model for students by selecting your own topic and brainstorming the questions you have about it. For example: "I want to learn about the creepy crops because I've heard about crop circles before, and it looks interesting. I want to know why it is called a crop circle, why they happen, and where they happen."
   - Tell students you are glancing over the pictures, illustrations, and the text to figure out what you want to learn and to think of questions you have about crop circles.
   - **Guided Practice**—Invite students to work in pairs to help you come up with two more possible questions about the crop circles before reading. Add these questions to the chart. Tell students you will read the page carefully to answer these questions and any other questions that pop up in your head during reading.
   - **Independent Practice**—Ask students to look over their selected pages briefly to study the pictures, illustrations, and text. Encourage students to ask at least three questions about their topic. Have students write their questions in their reading notebooks or on sticky notes. Tell them they will return to their questions after reading to see if they've been answered.
   - For additional practice with comprehension, have students complete the *Establishing a Purpose* activity sheet (page 159).

English Language Support

Show students the photos on pages 36–37 of the book to familiarize them with mysterious events. Teach them the basic terms, such as *shower*, *rains*, and *bizarre*.

Model Lesson 1: Establishing a Purpose *(cont.)*

During Reading

1. **Establishing a Purpose**
   - **Model**—Say, "As I read, I look for answers to my questions."
   - Read page 16 aloud. Say, "I wanted to know why crop circles happen. This part doesn't tell me that, but it does tell me some information I didn't know before, like how they are too perfect to be made by people. By reading the sidebar 'One Theory' on page 17, I am able to figure out that some scientists think they are formed by vortices."
   - **Guided Practice**—Ask students to help you answer the rest of your questions as you read the page aloud. Have students read the page carefully, find the answer, and report back to the class. Students should be prepared to explain their answers with evidence from the text, whether it is "right there" or inferred.
   - **Independent Practice**—Have students turn to their selected topic in the book. Refer to the three questions they already established before reading. Remind students to read slowly and carefully to find answers.

Assessment Opportunity—Students share one of their questions and answers with you. Do students know how to find answers in the text and infer using clues?

After Reading

1. **Establishing a Purpose**
   - **Model**—Explain that readers are often asked to share what they've read with others. Say, "I am going to teach you about my page, so I need to reread it carefully to remember important points and interesting details."
   - Read the page aloud, pausing to note the ideas you want to remember. Say, "Here is my oral report: Crop circles are an interesting mystery. They are designs, or patterns that appear in crops, most often in a circular shape. They happen all around the world. Some people think they are hoaxes, or tricks, but some scientists think they happen because of spinning masses of air."
   - **Guided and Independent Practice**—Students reread their pages carefully so they can present their material to the group. Allow time for partners to practice before presenting.
     Note: You may prefer asking the students to present their "reports" to the entire class. Students may make visuals to accompany their presentations. They may use the websites on page 47 to do further research.

English Language Support

Put students in pairs. Have one person in each pair pick a topic to explain to his or her partner. Students should only describe their topics and not tell their partners what the topic is. Their partners will try to guess the topic using the clues their partners give.

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Model Lesson 2: Understanding Text Structure

Before Reading

English Language Support

Have students work with partners to reinforce oral language. One student will read a date from "Strange Rains" on page 37 and another will read the location and the object that rained.

1. **Activating Prior Knowledge**
   - Ask students to reflect on what they already know about the book. Have they learned something new? What connections did they make?
   - Ask students to share what they know about maps. Show students the world map on pages 22–23, discussing its purpose and features. Point out that world maps are often used to show you where you are in relation to other places in the world.
   - Say, "Today we will use a special kind of 'map' that will help us figure out how different pages and parts of this book are organized and where the author is 'going' with the information."
2. **Understanding Text Structure**
   - **Model**—Say, "Nonfiction authors use different text structures to help organize information. If we can figure out which text structures the author is using, then we will better understand the reading."
   - Show students the "Phenomenal Proof" diagram on page 9. Ask how the diagram is arranged (*chronological order*).
   - Then show students the first paragraph on page 8. Read this paragraph out loud and point out how it begins with a topic sentence and continues with supporting details (*concept and definition*). Explain to students that you will look for this structure in other places in the text while you read.
   - **Guided Practice**—Bring students' attention to pages 10–11 and have them predict how the pages are organized (*topic sentence and supporting details*). Tell students to skim the text for clues. Then read the pages and discuss the organization. Do this for other charts and diagrams throughout the book.
   - **Independent Practice**—Have students make an organizational prediction chart listing the title of each heading or subheading and the type of organization they believe it may have.

Model Lesson 2: Understanding Text Structure *(cont.)*

During Reading

1. **Understanding Text Structure—**During reading, ask students to reference their organizational prediction chart. Have them check to see if their predictions were correct.
   - **Model**—Say, "I am going to see if my prediction based on the heading 'Racing Rocks' is correct. I predicted that the book would discuss rocks that look as if they are racing one another. I gathered my prediction by reading the heading and looking at the picture of the track following the rock. I wonder if my prediction is correct."
   - Read page 26 to the class. Say, "After reading the text, it looks like my prediction is on the right track. It mentions the tracks make it look as though the rocks are racing."
   - **Independent Practice**—Have students choose a sidebar in the book to make a prediction about. Then have them read the sidebar to see if their predictions were correct. Monitor and assist students as needed.

Assessment Opportunity—As you read with individual students, ask them to identify which organization fits the page they are on and explain why. Evaluate how students predict text organization before reading or how they identify organization after studying a page.

After Reading

1. **Understanding Text Structure**
   - **Model**—Explain that when readers are aware of text structure before, during, and after reading, it helps them remember the main points.
   - Look at page 37. Say, "When I first looked at this page I didn't notice the organization, but it is actually organized. Can you look closely and identify how the author chose to organize this page? (*chronologically from left to right and then top to bottom*). How does this organization help you if you are looking for a date?"
2. **Summarizing and Responding**—Ask students to reflect on the reading and discuss anything that was surprising to them. Have them use the sentence frame *I felt _____ was surprising because _____.*

English Language Support

Have students reread page 9 in the book. Have them create a flow chart for how ball lightening is created. Students should be accurate in the amount of lightening from Steps 1–5.

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Comprehension Mini Lessons and Practice Opportunities

Establishing a Purpose

Any chapter	**Reading to Answer Questions**—Model how to look at each page within a chapter and how to ask questions in your head before reading. Demonstrate how to use the headings, key words, and visuals to prompt questions before you read. Have students practice this strategy. Then have partners share one question they asked and then found an answer to.
Entire book	**Reading to Choose a Topic**—Allow students to select something from the book they are interested in learning more about. Invite students to read more about their topics using the websites suggested on page 47 or by visiting the library. Before they begin reading, have students think of at least three questions they have about their selected topic. Were their questions answered after reading?
Entire book	**Mini Presentations**—Have students select one mystery from the book to report on. Have them create a big book of facts about their mystery to share with their peers. Guide students as they decide what information is most important to share and illustrate.

Understanding Text Structure

Entire book	**Questions for the Author**—Ask students if they could meet the authors of this book, what would they like to ask about the choices the authors made in organizing it.
Entire book	**Cue Word Hunt**—Text structures contain cue words that can help us figure out the structure the author used. As a class, go on a cue hunt through the first few pages of the book. Then let students work with a partner to cue hunt through the rest of the book.
Entire book	**Sidebar Information**—Ask students to take another look at the sidebar information throughout the book. Discuss how interesting the information is and how the sidebars allow authors to put additional information that is relevant to the text into the book. Ask students to identify which sidebar they think is the most interesting.
Entire book	**Sketch a Page**—Ask students to find their favorite page or two-page spread in the book and draw pictures that represent the main points. Remind students to reread the page and include main ideas, details, or steps in their drawings.

Using Text Types

- Read pages 34–35 of *Unsolved! Mysterious Events* and "The Tunguska Impact 100 Years Later" (page 157). Discuss the causes and effects of the event as recorded in both texts.
- Then have students write a cause and effect summary that reflects their thoughts on the event.

Writing

Instruct students to write a media article about a mystery in their community (real or made-up). Have students discuss some ideas with partners before writing.

- **Below-grade-level students:** Write an article, including a headline and details about who, what, when, where, and how.
- **On-grade-level students:** Write the article in a one-paragraph form including a lead sentence that engages the reader.
- **Above-grade-level students:** Write a multiparagraph article including supporting details that are clear and specific.

Cross-curricular Connections

Geography—Have students plot the locations on pages 22–23 on a map. Then have them measure the distance between their town and where mysterious events took place. Have them use the bar scale to determine the approximate distance in miles.

Science—Discuss the Floating Balls of Fire from Chapter 2. Discuss the theory that gases from the river bottom rise to the surface and ignite. Then discuss how the gases (physical environment) may impact the people in the area (personal health).

Building Fluency

1. **Reading the Book**—Use one or all of the following methods for fluency practice:
   - Use a copy of the book (on the Digital Resource CD) along with the professional audio recording (on the Audio CD) so students can practice reading to build fluency.
   - Use the choral-reading strategy to read the book several times with students, and allow students to practice reading the book silently and in pairs.
2. **Reading the Poem**—Use one or both of the following methods for fluency practice:
   - Display the poem "The Truth Is Out There" (page 182). Ask students how the poem and the book are similar and different.
   - Write the poem on a sheet of chart paper. Encourage students to create actions, gestures, or a tune to go along with the poem. Reread chorally throughout the day to build fluency.

Assessment Opportunity—Use the oral reading record and the fluency rubric provided in the Assessment Guide to assess students' ability to read the book and poem fluently and accurately.

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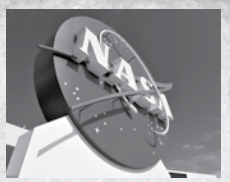
The Tunguska Impact 100 Years Later



June 30, 2008: The year is 1908, and it's just after seven in the morning. A man is sitting on the front porch of a trading post at Vanavara in Siberia. Little does he know, in a few moments, he will be hurled from his chair and the heat will be so intense he will feel as though his shirt is on fire.

That's how the Tunguska event felt 40 miles from ground zero.

Today, June 30, 2008, is the 100th anniversary of that ferocious impact near the Podkamennaya Tunguska River in remote Siberia—and after 100 years, scientists are still talking about it.

"If you want to start a conversation with anyone in the asteroid business all you have to say is Tunguska," says Don Yeomans, manager of the Near-Earth Object Office at NASA's Jet Propulsion Laboratory. "It is the only entry of a large meteoroid we have in the modern era with first-hand accounts."

While the impact occurred in 1908, the first scientific expedition to the area would have to wait for 19 years. In 1921, Leonid Kulik, the chief curator for the meteorite collection of the St. Petersburg museum led an expedition to Tunguska. But the harsh conditions of the Siberian outback thwarted his team's attempt to reach the area of the blast. In 1927, a new expedition, again lead by Kulik, reached its goal.

"At first, the locals were reluctant to tell Kulik about the event," said Yeomans. "They believed the blast was a visitation by the god Ogdy, who had cursed the area by smashing trees and killing animals."

While testimonials may have at first been difficult to obtain, there was plenty of evidence lying around. Eight hundred square miles of remote forest had been ripped asunder. Eighty million trees were on their sides, lying in a radial pattern.

"Those trees acted as markers, pointing directly away from the blast's epicenter," said Yeomans. "Later, when the team arrived at ground zero, they found the trees there standing upright – but their limbs and bark had been stripped away. They looked like a forest of telephone poles."

Such debranching requires fast moving shock waves that break off a tree's branches before the branches can transfer the impact momentum to the tree's stem. Thirty seven years after the Tunguska blast, branchless trees would be found at the site of another massive explosion — Hiroshima, Japan.

The massive explosion packed a wallop. The resulting seismic shockwave registered with sensitive barometers as far away as England. Dense clouds formed over the region at high altitudes which reflected sunlight from beyond the horizon. Night skies glowed, and reports came in that people who lived as far away as Asia could read newspapers outdoors as late as midnight. Locally, hundreds of reindeer, the livelihood of local herders, were killed, but there was no direct evidence that any person perished in the blast.

Note: This is not the full article. To view the whole article visit http://science.nasa.gov/science-news/science-at-nasa/2008/30jun_tunguska/

http://science.nasa.gov/science-news/science-at-nasa/2008/30jun_tunguska/

Name: _____ Date: _____

Shades of Meaning

Directions: Read the words in the Word Bank below and think about their meanings. Find two words that are near synonyms. Order the words according to their shades of meaning. Then write the words in the correct box.

Word Bank

massive **thrilled** ~~**mad**~~ **brilliant** ~~**furious**~~ **call**
shout **clever** **loathe** **glad** **large** **dislike**

Less		More
1. mad	angry	furious
2.	smart	
3.	hate	
4.	happy	
5.	yell	
6.	huge	

7. Challenge: Think of your own set of words that have similar shades of meaning.

_____ _____ _____

_____ _____ _____

_____ _____ _____

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Name: _____ Date: _____

Establishing a Purpose

Directions: Read the section headings below. Write a purpose you might have for reading each section.

1. A Mysterious World

_____

_____

2. Spooky Sights and Sounds

_____

_____

3. Puzzling Patterns

_____

_____

4. Unexplained Events

_____

_____

Oral Reading Record

Name:_____ **Date:** _____

Assessor: _____

Word Count	Codes				
229	E = errors	SC = self-corrections	M = meaning	S = structure	V = visual

Page	Text	E	SC	Cues Used	
				E	SC
4	There have been many advances in science and technology. But many things about our world remain mysterious. In Thailand, glowing balls of light rise up from a river once a year. In Honduras, fish rain down from the sky every summer. In the California desert, huge rocks slide across the ground when no one is watching. These strange phenomena may seem like science fiction. But the events in this book are scientific fact. They have been seen by many people. They have been photographed and studied by scientists. And yet they remain unsolved mysteries.			M S V	M S V
	SUBTOTALS				

GO ON

Oral Reading Record *(cont.)*

Page	Text	E	SC	Cues Used	
				E	SC
6	The world is full of strange sights and sounds. There are glowing orbs and balls of lightning that hover in the air. There are intense booms. And there are rocks that ring like bells. Millions of people have been lucky enough to see and hear these mysterious phenomena!			M S V	M S V
7	For a few nights every October, people in Thailand see a strange light show. Glowing orbs rise from the Mekong River. The lights range in size from tiny sparks to spheres as big as basketballs. They glow red and pink as they float into the sky. Locals call these Naga fireballs. The Naga are dragons believed to live in the river. Scientists say gases from the river bottom rise to the surface and ignite. It happens every year. But researchers are still trying to explain this event.			M S V	M S V
	Subtotals from previous page				
	TOTALS				

Error Rate: ☐ **Self-Correction Rate:** ☐ **Accuracy Percentage:** ☐ **Time:** ☐

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Multiple-Choice Test

Name: _____ Date: _____

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

1 **The Nazca lines are in _____.**

- (A) Peru
- (B) the United States
- (C) Egypt
- (D) Russia

2 **Which of these is *not* a tool scientists use to investigate strange events?**

- (A) microphone
- (B) Geiger counter
- (C) notebook
- (D) milk

3 **You can infer that if a rock is made of diabase, _____.**

- (A) it will catch fire quickly
- (B) it will be heavier than other rocks
- (C) it will ring when you hit it with a hammer
- (D) it will attract a lot of animals

4 **This book mostly tells you about _____.**

- (A) the Nazca lines
- (B) strange events and how scientists study them
- (C) people who hear strange noises
- (D) ESP

5 **If you have a strange feeling you've experienced something before, you might have _____.**

- (A) vapor
- (B) geoglyphs
- (C) silicon
- (D) déjà vu

6 **Scientists form _____, or ideas, to explain strange events.**

- (A) hoaxes
- (B) phenomena
- (C) hypotheses
- (D) playas

Multiple-Choice Test *(cont.)*

Name: _____ Date: _____

7 **When you don't understand something, you try to find a way to explain it. When you do that, you are forming a _____.**

(A) theory
(B) silicon
(C) vapor
(D) geoglyph

8 **Scientists think that ball lightning starts when _____.**

(A) the vapor floats through the air in small, glowing orbs
(B) lightning hits element-rich soil
(C) lightning hits water
(D) the glowing balls explode

9 **Why do you think the Nazca lines in Peru have never been erased?**

(A) Everyone wants the lines to stay.
(B) They are too small to see.
(C) They are in a desert where there is very little rain.
(D) They were built by aliens.

10 **This book would be a good resource for _____.**

(A) people who want to read about mysterious events
(B) people who want to tour Peru
(C) people who want to make their own crop circles
(D) people who want to learn how to survive in the desert

11 **The authors use words such as *strange*, *unusual*, and *eerie* _____.**

(A) to make you afraid to read the book
(B) to add rhyming words
(C) to help you learn what the words mean
(D) to tell you these events are odd

12 **What might happen if you discovered a new unsolved mystery?**

(A) You would not notice anything.
(B) Scientists would probably want to study it.
(C) No one would be interested.
(D) You would be able to explain it right away.

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TIME FOR KIDS

UNSOLVED!

Mysterious Events

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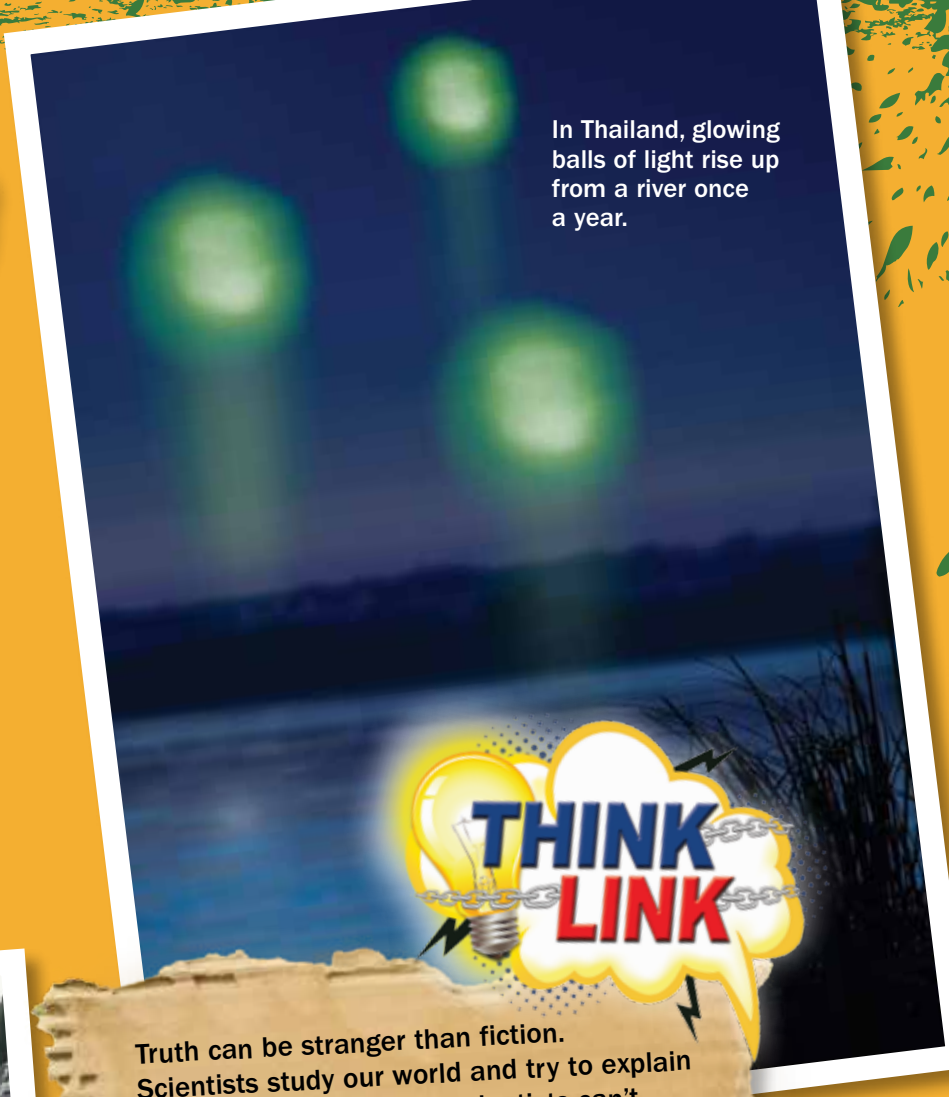
A Mysterious World

There have been many advances in science and technology. But many things about our world remain mysterious. In Thailand, glowing balls of light rise up from a river once a year. In Honduras, fish rain down from the sky every summer. In the California desert, huge rocks slide across the ground when no one is watching.

These strange **phenomena** (fi-NOM-uh-nuh) may seem like science fiction. But the events in this book are scientific fact. They have been seen by many people. They have been photographed and studied by scientists. And yet they remain unsolved mysteries.

In Honduras, fish rain from the sky every year.

In Thailand, glowing balls of light rise up from a river once a year.



THINK LINK

Truth can be stranger than fiction. Scientists study our world and try to explain why things happen. But scientists can't explain these freaky phenomena.

- Why do you think people see creatures that don't exist?
- How can we explain events when no one can see or witness them?
- Why is it important to investigate these strange events?

Spooky Sights and Sounds

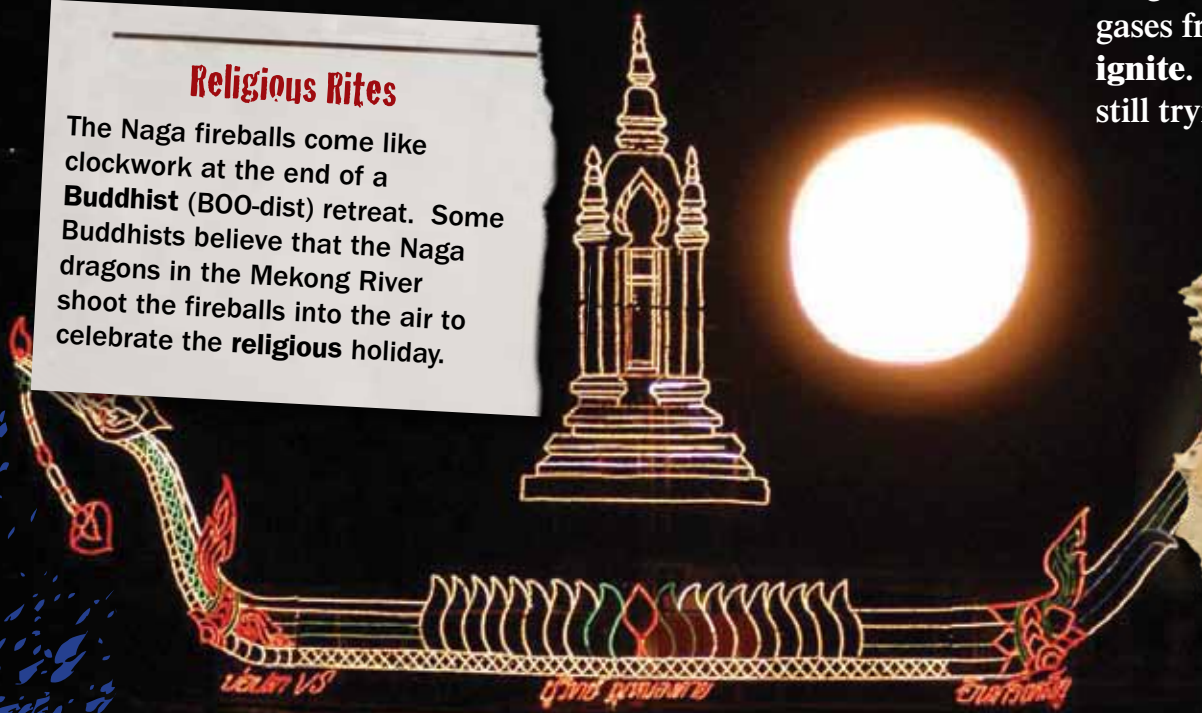
The world is full of strange sights and sounds. There are glowing **orbs** and balls of lightning that hover in the air. There are intense booms. And there are rocks that ring like bells. Millions of people have been lucky enough to see and hear these mysterious phenomena!

Floating Balls of Fire

For a few nights every October, people in Thailand see a strange light show. Glowing orbs rise from the Mekong River. The lights range in size from tiny sparks to spheres as big as basketballs. They glow red and pink as they float into the sky. Locals call these **Naga** fireballs. The Naga are dragons believed to live in the river. Scientists say gases from the river bottom rise to the surface and **ignite**. It happens every year. But researchers are still trying to explain this event.

Religious Rites

The Naga fireballs come like clockwork at the end of a **Buddhist** (BOO-dist) retreat. Some Buddhists believe that the Naga dragons in the Mekong River shoot the fireballs into the air to celebrate the **religious** holiday.



Nature's Jack-o'-Lanterns

In the United States and Canada, floating lights are often seen in swamps and bogs. They are called *will-o'-the-wisps, jack-o'-lanterns, hinkypunks,* or *fairy lights.* Scientists say that decaying plants emit chemicals. This process can produce flickering lights.

Boing, Boing, Zap

For hundreds of years, ball lightning has baffled scientists. Witnesses tell of glowing balls that hover in the air. Sometimes, they bounce off the ground, sizzle, spin, or spark. They can even melt through glass and metal! The lightning balls appear suddenly indoors and fade away quickly. Sometimes they even explode.

The orbs can vary in size. Some are as small as a tennis ball. Others are as large as a beach ball. They usually occur during storms. There are nearly 10,000 accounts of ball lightning. But scientists have been unable to explain this strange phenomenon.

Eyewitness Account

In 2011, Rose Bellamy was taking cover from a massive tornado headed toward Joplin, Missouri. A strange sight caught her attention. She told a local newspaper, "I saw balls of fire in the backyard, big balls of red fire about the size of basketballs bobbing along across the backyard. I have no idea what it was."

Phenomenal Proof

In 2007, scientists tested the **theory** that lightning strikes soil and makes a **vapor**. With this experiment, they were able to create ball lightning in the lab. Their results are giving scientists a better understanding of how this mysterious phenomenon occurs in nature.

Step 1

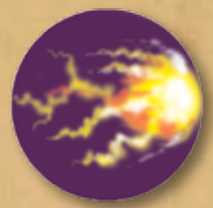
Lightning strikes soil that's rich in elements such as **silicon**, aluminum, or iron.

Step 2

Heat from the lightning transforms the soil into a vapor.

Step 3

The vapor combines with the air and begins burning.



Step 4

The vapor floats through the air in small glowing orbs.

Step 5

Within 10 seconds, the glowing balls disappear or explode.

Rock Music

Ringing Rocks State Park in Pennsylvania is a unique place. It is an open field of boulders in the middle of the forest. That is weird. But there is something even stranger at this park. The rocks make music!

The ringing rocks are made of **diabase**. Diabase is a type of rock in Earth's crust. When struck with a hammer, the rocks ring like bells. All the rocks are made of the same thing. But it appears only some of them make music. Some people believe all the rocks in the park can ring. But some may make sounds that are too low for humans to hear. Scientists have not figured out how the ringing happens.

In 1890, Dr. J. J. Ott gave the world's first rock concert, playing the ringing rocks with a hammer.

World Music

Ringing rocks have been found in Pennsylvania, Montana, Mexico, England, Scotland, and Australia.

Visitors may be tempted to take a ringing rock home, but they will be disappointed. The rocks lose their musical sound when they are away from the other rocks.

Sound Effects

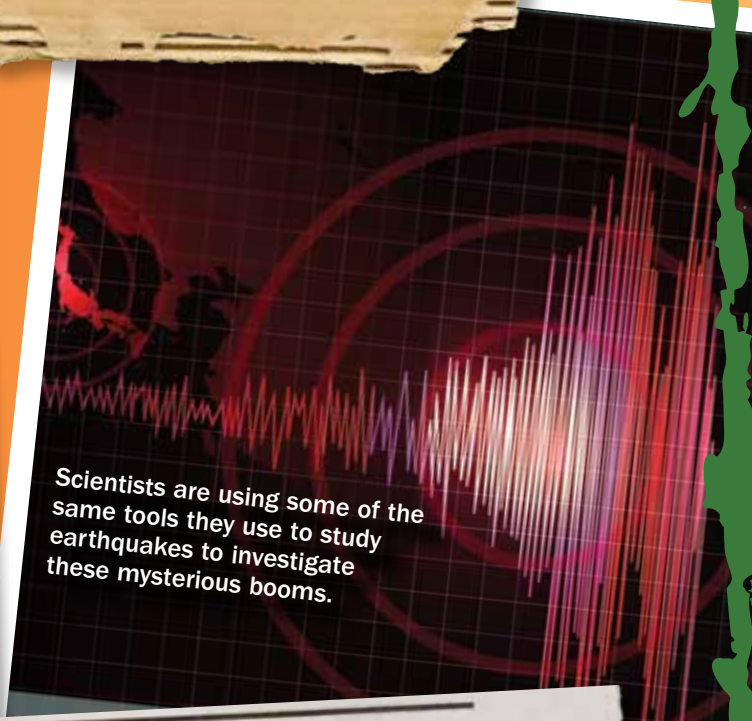
People around the world have reported hearing loud booms. The sounds were not made by storms. They were not made by humans. But they are strong enough to shake houses! Scientists have many theories about the booms. Some think they may be caused by small earthquakes. Others point to mud volcanoes. Still other people guess they may be from meteors or booming sands. But researchers have yet to find proof.

These strange sounds have been heard all over. People on the North Carolina coast and in upstate New York have heard the booms. They have also been heard in Belgium and Italy. And booms have been heard in India and Japan, too.

Could volcanoes cause these mysterious booms?

One Phenomenon, Many Names

People in Belgium call the big booms *mistpouffers*, which means "fog belches." In Italy they are called *brontidi*. In the 1800s, author James Fenimore Cooper coined the term *Seneca guns* for the sounds that shake Lake Seneca in upstate New York.



Scientists are using some of the same tools they use to study earthquakes to investigate these mysterious booms.

"Ear"-Witness Account

In 2005, a powerful boom shook the North Carolina coast. One man described it to the local newspaper saying, "It felt like an earthquake. It shook every house in this neighborhood."

Puzzling Patterns

Strange designs cover the land in many parts of the world. Peculiar patterns can be seen in fields. Others show up in desert sands. In Peru, the desert floor is decorated with huge drawings. They show animals, plants, and people. Giant circles in cornfields appear around the world. Tracks in the soil from moving rocks puzzle visitors to California's Racetrack Playa. These strange markings leave more questions than answers. Who made the designs? How were they made? And why?

Mysterious patterns cover land around the world.

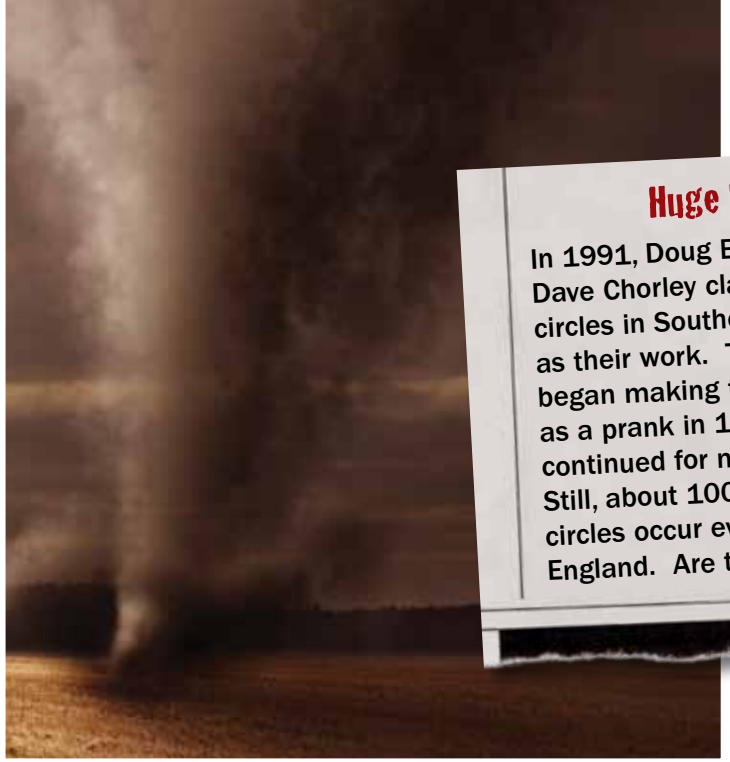
"You are a problem
And a rune;
You are mystery,
Writ on a stone."

—Hilda Doolittle, poet

Creepy Crops

Crop circles are designs that appear suddenly in farm fields. Inside large circles, crop stalks are flattened. The bent stalks and the standing stalks form a design. Crop circles can be a few simple circles or detailed patterns. They are best viewed from above.

Many crop circles appeared in England in the 1980s. But they have been seen around the world. Some crop circles have been hoaxes. But some researchers say many of the circles are too perfect to have been made by people.



Huge Hoax

In 1991, Doug Bower and Dave Chorley claimed the crop circles in Southern England as their work. They said they began making the designs as a prank in 1978. They continued for nearly 20 years. Still, about 100 new crop circles occur every year in England. Are they all hoaxes?

Unique Job

A **cereologist** (ser-ee-OL-uh-jist) is a person who studies crop circles. Many cereologists believe that crop circles are not man-made. They look for proof that **extraterrestrial** (ek-STRUH-tuh-RES-tree-uhl) beings made the designs.

One Theory

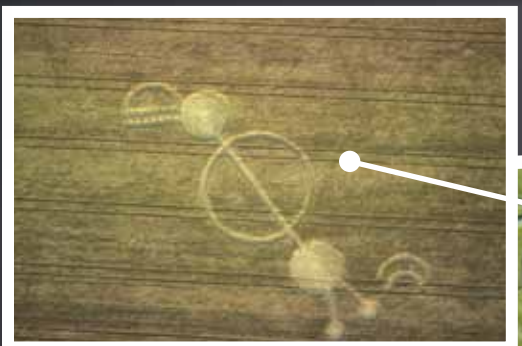
Scientists are looking for a link between crop circles and **vortices** (VAWR-tuh-seez). A vortex is a whirling mass of air that draws things toward its center. Crops on the ground could be gently bent over by these spinning air masses. The landscape of southern England lends itself to the formation of vortices.

DIG DEEPER!

Anatomy of a Crop Circle

What's the big deal? Is a crop circle just a bunch of broken grass? Read more to find out why these circles are so curious.

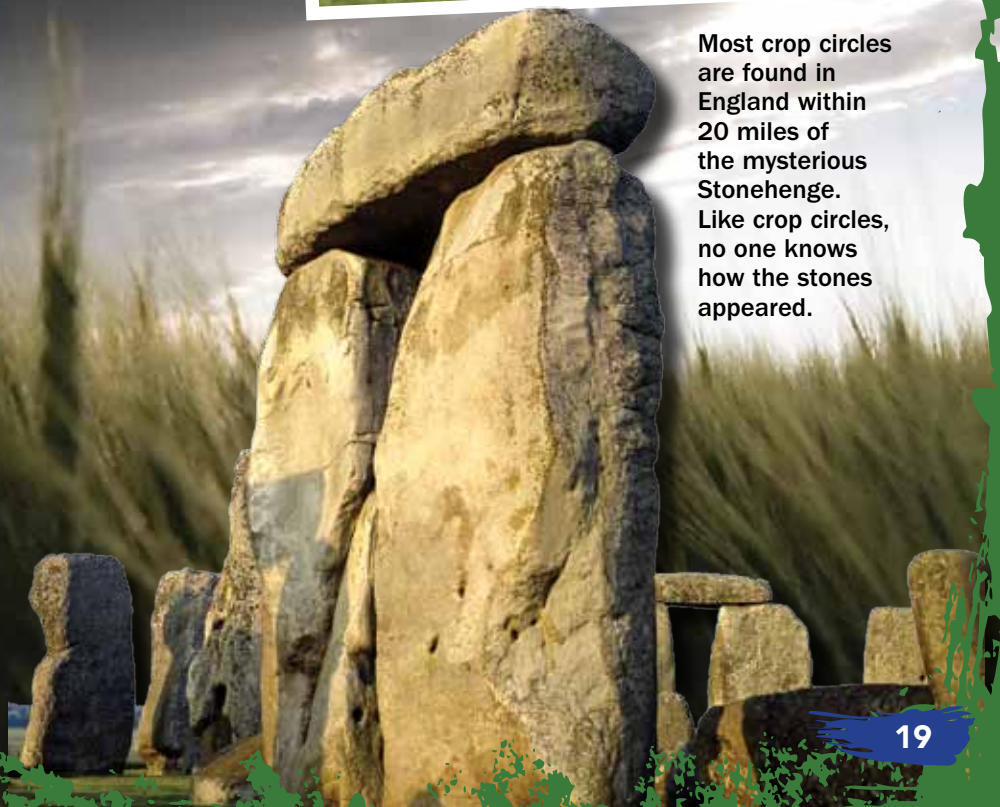
Crop circles can be beautiful and baffling.



Some fields have had multiple crop circles over the years.

Birds often avoid flying over the crop circle airspace.

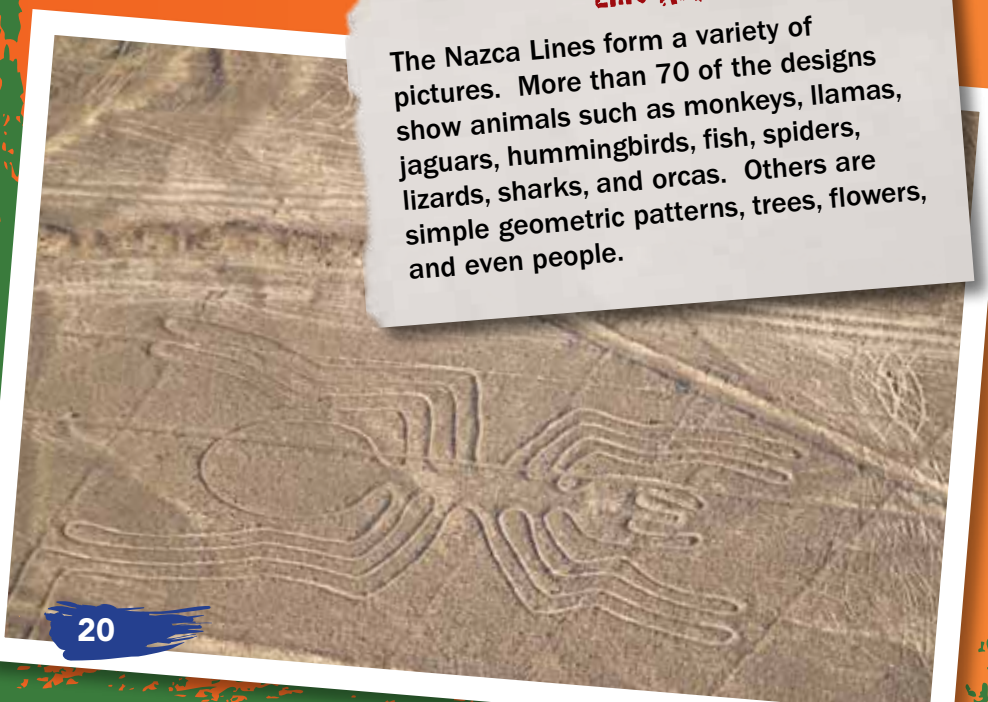
The stalks of the grain from a crop circle are often bent to a 90-degree angle without breaking.



Most crop circles are found in England within 20 miles of the mysterious Stonehenge. Like crop circles, no one knows how the stones appeared.

Drawings in the Desert

In the 1920s, pilots flew over Peru for the first time. They reported seeing huge designs on the desert floor. There were hundreds of drawings. They showed animals, plants, and people. The largest pictures are about as long as two football fields. These **geoglyphs** (JEE-o-glifs) make up the Nazca Lines. The Nazca people made them 2,000 years ago. They scraped away the top layer of earth to reveal the dirt below. But one question remains. Why did the ancient people make designs best seen from the sky?



Line Art

The Nazca Lines form a variety of pictures. More than 70 of the designs show animals such as monkeys, llamas, jaguars, hummingbirds, fish, spiders, lizards, sharks, and orcas. Others are simple geometric patterns, trees, flowers, and even people.

The Nazca people fished in the ocean 15 miles away. Heavy rains, flooding, and storms in the ocean may have led to the death of the Nazca people 1,500 years ago.

Religious Rites

Most researchers agree that the lines are related to the Nazca's religious beliefs. Some say the lines are sacred paths leading to places of worship.

Mystery Map

Check out these mysterious locations in our world.

Pennsylvania

The official Ringing Rocks State Park can be found in Pennsylvania. Rocks have also been heard in Mexico, England, Scotland, and Australia.

England

Crop circles were first reported in England. Today, they appear to be a worldwide phenomena.

Missouri

Perhaps 1 in 150 people has observed ball lightning. It was recently seen in Joplin, Missouri in 2011.

North Carolina

Mysterious booms have been heard off the coast of North Carolina as well as in New York State and countries around the world.

Peru

The Nazca lines can be found south of Lima, Peru. The oldest lines date back to 500 BC.

Thailand

This country has celebrated a religious holiday with the Naga fireballs for hundreds of years.

- What places would you like to explore?
- What mysterious event do you think has had the biggest impact on history?
- Why do you think there are no mysterious events shown in Africa?

The Crooked Forest

In a small forest in Poland, 400 strange pine trees grow crookedly. Each tree bends 90 degrees to the north. The mysterious trees were planted in 1930. Hundreds of normal trees grow around them. Those trees grow straight up. Some people believe the bend in the trees was made by people. They think people somehow held the trees down until they grew in a different direction. Scientists have studied the trees' size. The bend must have happened 7 to 10 years after they were planted. It's still not clear why or how someone would do this.

In the ancient art of bonsai (bahn-zahy), trees are planted in small pots and intentionally bent to look old and weathered.

Some people believe the trees in Poland were designed to be used as bent panels in boats.

Racing Rocks

Death Valley is the hottest place in North America. In this desert with the spooky name, mysterious rocks baffle scientists. Within Death Valley is a place called Racetrack Playa. The name comes from the tracks left by rocks. The rocks range in size. Some are just pebbles. But the largest is a 700-pound boulder. Some trails are more than 1,000 feet long. Somehow these rocks move across the flat land. No one has ever seen the racing rocks in motion. But visitors can see the trails they leave behind.

A Fitting Name

Death Valley is located in the Mojave (moh-HAH-vee) Desert of California. The area usually receives less than two inches of rain each year. Death Valley holds the record for the highest temperature in the western hemisphere—134 degrees!

Eyewitness Account

In 2010, a group of students visited the rocks at Racetrack Playa. One student, Andrew Ryan, said, "It's surprising when you see how big some of these boulders are. You think, *How can something that big get blown around?*"

Unexplained Events

The events in this chapter are varied and strange. But they all defy logic. One occurs only in the mind. Another happened more than 100 years ago. The third shocks people every year.

Been There, Done That

Déjà vu (DEY-zhah VOO) is a French term. It means "already seen." It refers to a strange event in the brain. From time to time, people get an odd feeling. They can feel some place is familiar—even if they haven't been there before. They are sure they have seen it before. People often describe the event as *eerie*.

Brain researchers are studying déjà vu. They are just beginning to solve the mystery. They say it might be caused by an overlap of a person's short-term and long-term memories.

The Opposite of Déjà Vu

Jamais vu (ZHA-me VOO) is a French term that means "never seen." It describes a familiar situation that a person does not recognize. A person with *jamais vu* feels that he or she is experiencing something for the first time even though it is a familiar event.

I Knew That!

Have you ever known something without knowing how you knew it? Perhaps you learned it long ago and forgot. Or maybe you were using **extrasensory perception** (**ESP**). It means being able to know things without using normal senses. Usually, we use touch, sight, hearing, taste, or smell to learn about the world. But some people say they are able to predict the future using ESP. Other people say they can use ESP to communicate with close family and friends.

Scientists test the power of ESP by asking people to predict what shape is on a random card.

Intuition

ESP may not exist, but intuition does. When people understand something intuitively, they understand it instantly. Scientists believe people who use intuition draw on past information and very small clues to make decisions.

Scientists test ESP by asking people to predict the future. They want to ask questions that could only be answered using ESP. It is hard to be sure the people are not receiving any hints. Scientists are still unsure if ESP really exists.

Extra Information

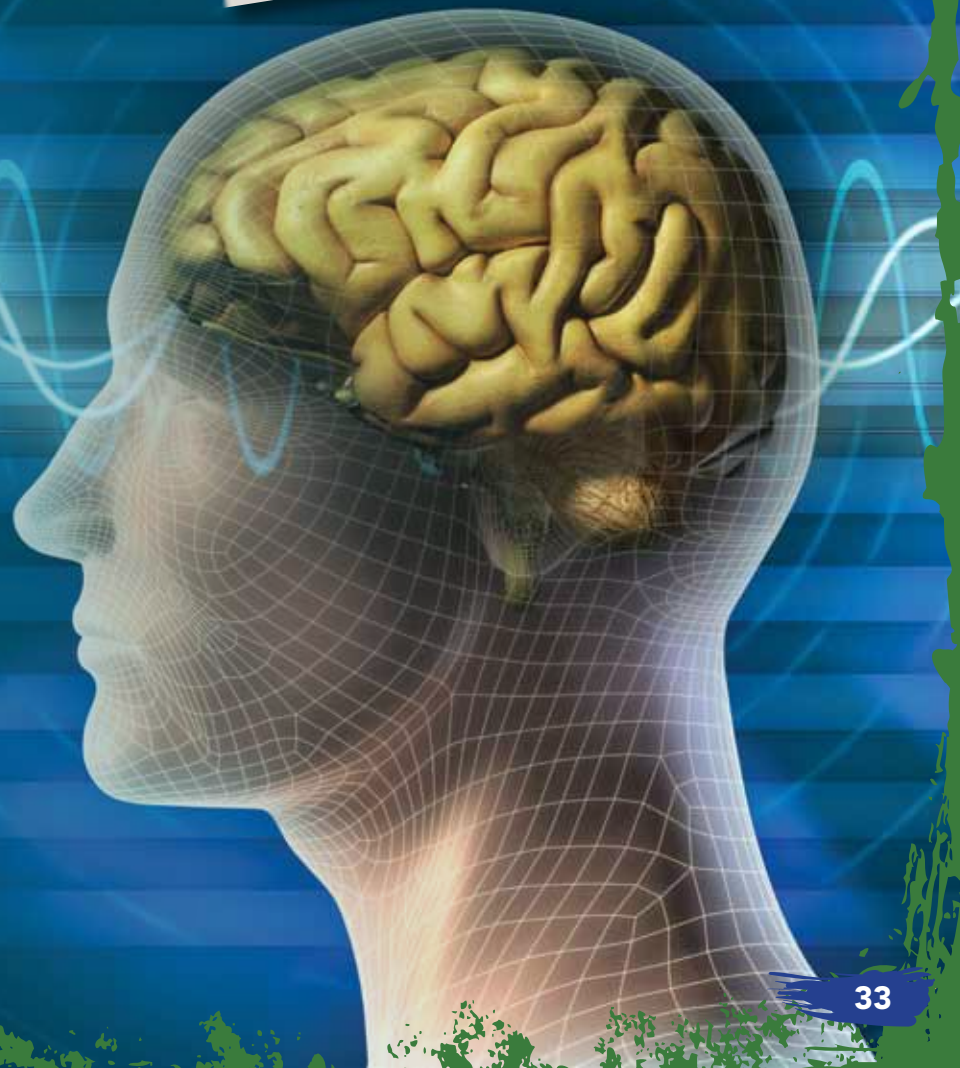
Some people think ESP exists, but most scientists doubt it. It may be that it appears ESP is happening when it's really something simpler. Some people may be really good at reading others' expressions and body language. Others believe that ESP happens when someone is able to feel waves of thought in the air. Still others think that ESP is only a strange coincidence. What do you think?

Close Connection

Have someone you are close to try to guess what you're thinking about. Is your friend able to read your thoughts?

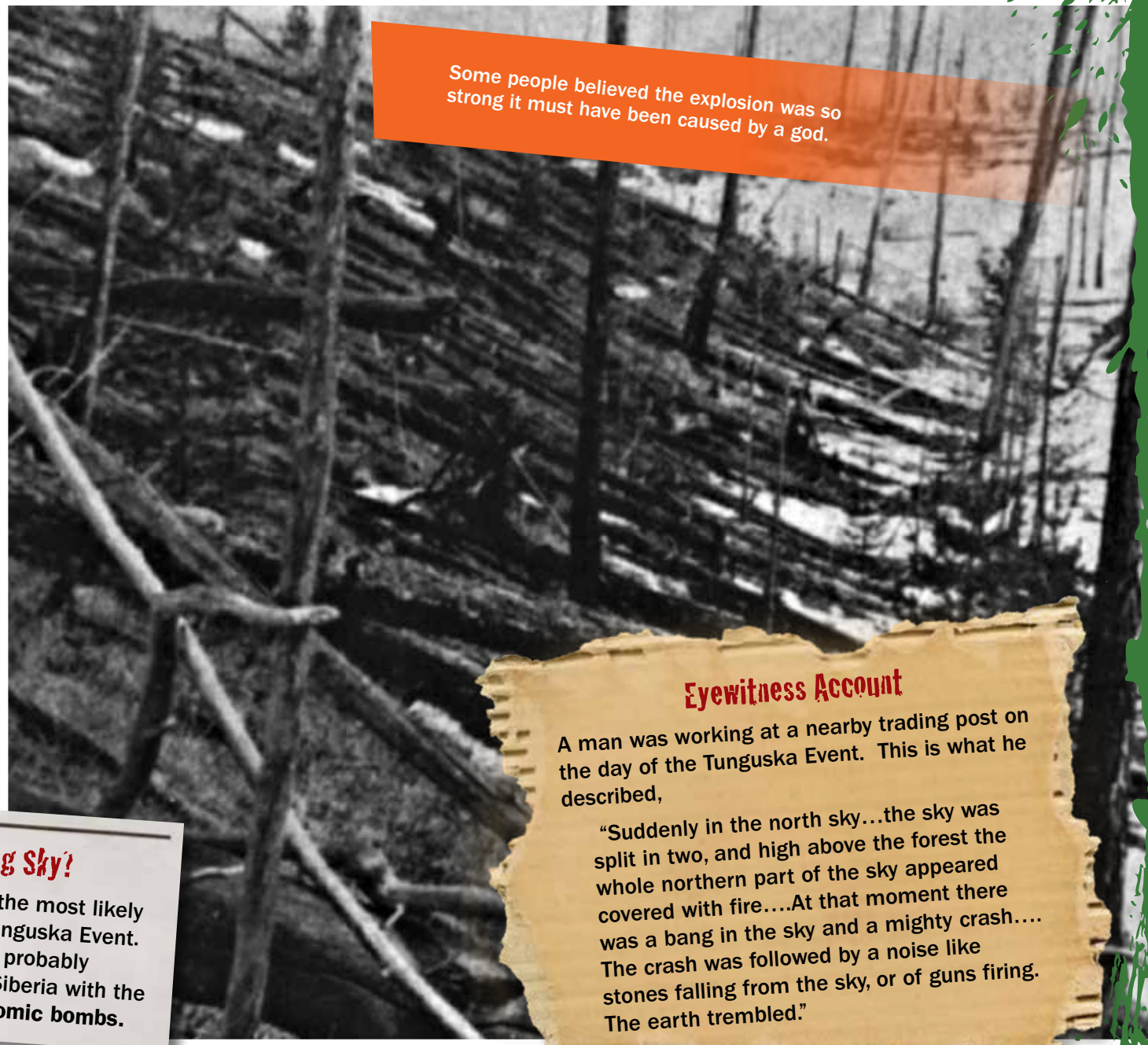
John Edward

John Edward is best known for his ESP abilities. Ever since he was a child, people believed he had special powers. People who have lost loved ones ask him for help. Over the last 20 years, John Edward has tried to use ESP to connect thousands of people to those who are no longer alive. Many people think his findings are accurate. Other people believe he is correct only 10 to 20 percent of the time.



A Powerful Blast

In 1908, a sudden blast shook Siberia, Russia. The explosion flattened 800 square miles of forest. Eighty million trees lay on the ground. All of them were pointing away from the **epicenter**. Forty miles from the center, the blast threw a man from his chair. He said flames filled the sky. He got so hot he thought his shirt was on fire. This explosion became known as the Tunguska Event. It has puzzled scientists for more than a century.



Some people believed the explosion was so strong it must have been caused by a god.

Falling Sky?

An **asteroid** is the most likely cause of the Tunguska Event. The space rock probably exploded over Siberia with the force of 185 **atomic bombs.**

Eyewitness Account

A man was working at a nearby trading post on the day of the Tunguska Event. This is what he described,

"Suddenly in the north sky…the sky was split in two, and high above the forest the whole northern part of the sky appeared covered with fire….At that moment there was a bang in the sky and a mighty crash…. The crash was followed by a noise like stones falling from the sky, or of guns firing. The earth trembled."

It's Raining *What?*

Imagine walking down the street when frogs begin to fall from the sky like rain. After a few minutes, the shower ends. The ground is covered with frogs. It may sound like fiction, but animal rains are a fact!

People have reported **bizarre** rains for thousands of years. Frogs, fish, worms, and mussels have fallen around the world. Scientists accept the fact that animals rain from the sky. Yet they are unable to explain how this happens.

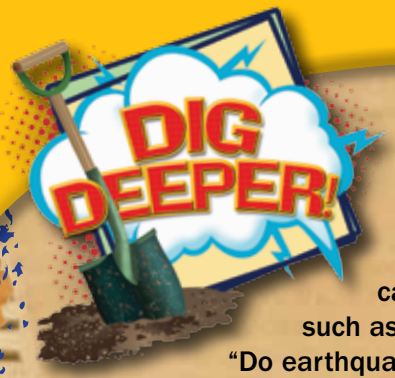
Rain of Fish

It rains fish every summer in Honduras. To make it even stranger, the fish that fall from the sky are not **native** to the region. Locals mark the event by cooking and eating the fish.

Strange Rains

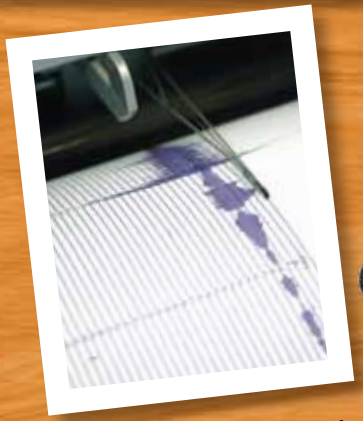
Check out some of the strangest weather our world has ever seen.

- 1861 Singapore **fish**
- 1873 Missouri **frogs**
- 1877 South Carolina **baby alligators**
- 1894 England **jellyfish**
- 1901 Minnesota **frogs**
- 1947 Louisiana **fish**
- 1989 Australia **fish**
- 2007 Argentina **spiders**
- 2009 Japan **frogs**
- 2011 Scotland **worms**



Tools of the Trade

Scientists are trained to ask questions, form **hypotheses**, and test their theories. This scientific method can be used to answer questions such as "What causes Naga fireballs?" or "Do earthquakes affect the weather?" Scientists use a wide variety of tools to observe mysterious phenomena and test their theories. The work of these researchers helps us discover the truth about our strange world.



A seismograph records vibrations in the Earth.

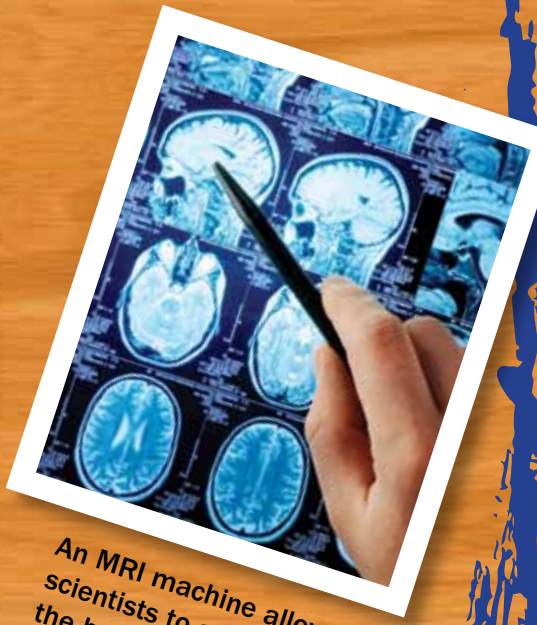
Microphones allow scientists to record odd sounds. Video cameras can capture events while people are at a safe distance.

Some things need to be seen to be believed. A camera is an important tool in recording strange events.

A Geiger counter detects energy that may be greater or smaller than normal.

Night vision goggles allow researchers to see in the dark.

Investigators should always carry a notebook with them. It's useful for recording observations in the field.



An MRI machine allows scientists to see how the brain works.

The Truth Is Out There

Many years ago, the brightest minds in the world said the Earth was flat. People thought fevers and earthquakes were caused by angry gods. Science has **debunked** those myths. But many mysteries are unexplained even today. Researchers have solid theories about ball lightning and déjà vu. But that is not the case with ringing rocks, crop circles, and animal rains. These events are harder to explain. One thing is certain. Future scientists will have plenty of questions left to answer about this wild world!

What do YOU think caused these events?

Glossary

asteroid—a rock that orbits the sun

atomic bomb—a highly dangerous nuclear weapon

baffled—confused or puzzled

bizarre—strange or unusual

Buddhist—a person who practices the religion of Buddhism

cereologist—a person who studies crop circles, especially those who believe the circles are not man-made

crop circles—large geometric designs created by flattened stalks in fields of grain, best viewed from above

debunked—proven false

déjà vu—a brain event that causes a feeling of having experienced something before

diabase—a type of rock that makes up Earth's crust and is also found in Ringing Rocks State Park in Pennsylvania

epicenter—the exact center or focal point

extrasensory perception (ESP)—the possible ability of some people to know about the environment without using their five senses

extraterrestrial—outside the limits of Earth

geoglyphs—large designs created on the ground

hoaxes—tricks designed to get people to believe something is true when it is not

hypotheses—ideas created to explain some unexplained phenomena

ignite—to set on fire

jamais vu—a brain event that causes a feeling of never having experienced a familiar event before

Naga—dragons that are believed to live in the Mekong River in Thailand

native—living naturally in a place

orbs—spherical objects

phenomena—things that are out of the ordinary and excite people's interest and curiosity

religious—relating to a belief in a higher power

silicon—a nonmetallic element found in Earth's soil

theory—a set of facts or principles analyzed and used to explain a phenomenon

vapor—moisture visible in the air as mist, clouds, fumes, or smoke

vortices—spinning air masses; plural of *vortex*

Index

Bibliography

Allen, Judy. *Unexplained: An Encyclopedia of Curious Phenomena, Strange Superstitions, and Ancient Mysteries*. Kingfisher, 2006.

Read about many of the phenomena discussed in this book, including raining frogs and crop circles. You will also learn about other phenomena that have baffled scientists for years.

Dennis, Jerry. *It's Raining Frogs and Fishes: Four Seasons of Natural Phenomena and Oddities of the Sky*. HarperPerennial, 1993.

This book investigates strange weather and storms that have occurred throughout history. It discusses the phenomena of raining frogs and fishes.

Helstrom, Kraig. *Crop Circles*. Bellwether Media, 2011.

Investigate crop circles around the world in this book. You will learn about different hypotheses on where the designs come from and explore the history of their sightings around the world.

McMullen, David. *Mystery in Peru: The Lines of Nazca*. Contemporary Perspectives, 1997.

This book discusses the mystery of the Nazca Lines in Peru. It makes hypotheses on what they were used for in ancient times by the Incas.

More to Explore

Poland's Crooked Forest

http://news.discovery.com/earth/polands-crooked-forest-mystery-110628.html

Search for "Poland's crooked forest" to learn more about this mystery and see more photographs.

Nazca Lines

http://www.go2peru.com/nazca_lines.htm

Read all about the Nazca Lines on this website. Information and a photo gallery are provided.

Ringing Rocks

http://www.unmuseum.org/ringrock.htm

This article tells about the ringing rocks in Pennsylvania. It even contains a link to recordings of the ringing so you can hear for yourself what the rocks sound like.

National Geographic for Kids

http://kids.nationalgeographic.com/kids/

National Geographic's website for kids provides information on a variety of topics from around the world and provides photos and videos of natural landscapes and wildlife as well as games and other activities.

About the Authors

Lisa Greathouse grew up in Brooklyn, New York, and graduated from the State University of New York with a bachelor's degree in English and journalism. She was a journalist with The Associated Press for 10 years and covered news on everything from science and technology to business and politics. She has also worked as a magazine editor for the food industry, a website editor for a university, and an author of many education publications. She is married with two children and resides in Southern California. She always carries a notebook so she can record mysterious events as they happen.

Stephanie Kuligowski has a bachelor's in journalism degree from the University of Missouri and a master's degree in teaching from National Louis University. She worked as a newspaper reporter and columnist before becoming a teacher. Stephanie taught fifth grade for seven years. She lives with her husband and their two children in Crystal Lake, Illinois, where she loves to practice ESP.