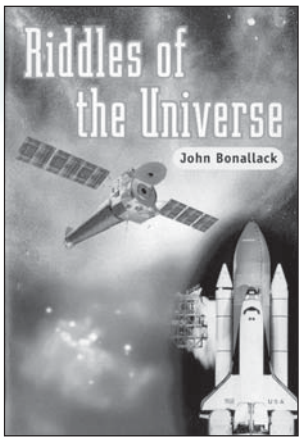
Riddles of the Universe



by John Bonallack

Book Summary

On 23 July 1999, Commander Eileen Collins took the space shuttle *Columbia* into orbit. Her mission: to launch the *Chandra* X-ray Observatory, which will help scientists find answers to some of the riddles of the universe.

Features of the Book

- Fact files
- Technical language – *dark matter, payload, sonic boom, supernova*
- Dramatic NASA photographs
- Labeled diagrams
- Captioned photographs
- Website references for further research
- Procedural text
- The format of the countdown sequence

Purpose

Riddles of the Universe can be used to introduce and reinforce the following skills:

- **S** drawing on students' background knowledge;
- **S** exploring technical vocabulary;
- **S** locating relevant information to support claims;
- **S** writing questions that encourage further research;
- **S** presenting information in different formats;
- **S** rewriting text from a different point of view.

The Guided Reading Lesson

- **S** Drawing on students' background knowledge
- **S** Exploring technical vocabulary
- **S** Locating relevant information to support claims

Introducing the text

Discuss the title with the students.

– *What is a riddle? Can you give me an example?*

Discuss the idea that a riddle is a curious question or situation that makes people think.

– *Do we know everything there is to know about the universe?*

– *What are some of the things that puzzle scientists?*

– *What do you think a riddle of the universe might be?*
The students may bring up the topic of black holes.

– *What do scientists think a black hole is?*

Record the students' ideas for later discussion.

Ask the students to discuss the blurb on the back cover.

– *Are the first three questions riddles?*

Discuss and clarify terms such as "mission," "shuttle," "orbit," and "observatory."

– *What do you think an X-ray observatory might do?*

Look at the first page of chapter 1 together.

– *What is happening here?*

– *Can you predict why the countdown has stopped?*

Reading and discussing the text

Ask the students to read the rest of chapter 1 independently. As they read, they could think about one or more of the following questions:

- *How does the author's style build tension for the reader?*
- *How might the astronauts be feeling in this chapter?*

Discuss the use of questions, short sentences, and pauses signaled by ellipses to heighten tension and keep the reader engaged.

- *What words would you use to describe how the astronauts might be feeling during the countdown?*

Ask the students to read chapter 2 independently. Before they do, look at the diagram on page 11 and discuss the concepts and use of vocabulary with them. Encourage the students to refer to the index to clarify words in bold and to make a note of any other vocabulary that they are unsure of.

When they have finished reading, discuss *Chandra*.

- *What is* Chandra*? Can you describe what it is made of?*
- *What is* Chandra *designed to do? How will it help scientists?*

Ask the students to support their ideas with references from the text. You could refer them to "Fun facts about *Chandra*" on page 28.

The students can now read the rest of the book independently. As they read, they could think about the following questions:

- *In zero gravity, even ordinary tasks become more difficult. What everyday activities might need special attention in space? How would you suggest that something like drinking a cup of coffee be made possible?*

Revisiting the Text

The suggested activities below can be used immediately after the guided reading lesson if appropriate or could be taken as a mini-lesson at a later time.

S Writing questions that encourage further research

Detailed information is given in the book, but students may have questions that they feel have not been answered. Encourage then to formulate questions as the basis for further research. For example:

- *How long will* Chandra *stay in orbit?*
- *What would have happened if the fuel leak were bigger and* Columbia *couldn't leave Earth's atmosphere?*
- *What happens to the space shuttle after the mission? You could direct the students to the website address and keywords on page 29.*

Suggest that the students present the answers to their questions to the class using a similar format to that used in *Riddles of the Universe*.

They could use the blackline master on page 85 to record their questions, sources, and findings.

S Presenting information in different formats

The book contains a lot of factual information in the form of figures such as, speeds, times, and distances. Sometimes, diagrams have been used to present these figures in a clear way because to present the information as narrative would be very complex.

Look at the diagram on page 5. It has been used to describe a step-by-step process. Ask the students to choose a section of the text and to present it as a procedural or explanatory diagram.

S Rewriting text from a different point of view

Ask the students to choose one of the crew and write a first-person account of their thoughts at a particular point in the mission, for example, at liftoff, during the launch of *Chandra* or on reentry to Earth's atmosphere.