

# Stars

by Bill Nagelkerke



## Overview

Scientists study the sun to help them understand more about stars. Using photographs and diagrams, *Stars* provides information about discovering and studying stars. The book concludes that scientists still have a lot to learn about stars! (Big idea: Scientists study Earth and space.)

### Suggested purposes

This book supports the following **comprehension strategies**:

- asking questions **AQ**
- visualising. **VS**

It supports the following **non-fiction strategies**:

- getting information from photographs
- gathering information from captions

### Key vocabulary

The vocabulary that is focused on includes:

- Anchor words – *Earth, planets, solar system, space, stars, universe*
- Content words – *core, distance, dwarfs, factory, flare, gas, giants, heat, life, light, names, night, patterns, photographs, scientist, sun, sunspots, telescope*
- High-frequency words – *about, another, feel, find, know, long, look, many, other, people, their, through, use*

## Features of the text

- Non-fiction features:
  - cover flap, which provides support for identifying the big ideas and anchor words
  - the topic (Earth and space), which expands on pages 10 and 11 of the anchor book *Being a Scientist*
  - preview question on the back cover
  - headings that introduce new aspects of the topic and support students to read sections
  - captions and labels that highlight features of the visuals
  - questions that focus attention on the topic
  - diagrams
  - cutaway diagram
  - comparative picture
  - fact file
  - glossary (boldface type)
  - index
- Word study:
  - multisyllabic words – *Galileo, photographs, telescope, universe, faraway, scientists, understand, discovered, factory, Antares*
  - comparative adjectives – *closest, hottest, big, small, biggest, bigger, smallest, smaller*
- Descriptive language:
  - similes – *like tiny dots of light, like a giant factory making heat and light*
- Historical information
- Pronunciation guide (page 19)



## Setting the scene

If you have already introduced the topic using the whole-class lesson plan and the anchor book (*Being a Scientist*), you can review the discussion and show the students pages 10 to 11 of the anchor book.

Ask the students what they know about space.

- *How do we know about these things?*
- *Who do you think found out about them?*
- *If you wanted to know more about space, what could you do?*

## ELL support

If you are getting a silent response from ELL students, it may not mean that they are not engaged in the learning. They may be processing information and developing understanding through oral discussions. Their vocabulary and conceptual understanding is developing.

## The first reading

**Pages 2 and 3** – *How many stars do you think are in space? What does “billions” mean to you? Why do you think an exact number hasn’t been given?* Discuss the meaning of “universe”. **(Visualising)** Encouraging the students to think about the vastness of space. (“Universe” is a broad term that includes everything in space, including the solar system and the galaxies.)

**Pages 4 and 5** – Prompt the students to make connections with the information about the constellations, for example, in horoscopes. *The text says that people gave the patterns names. Why do you think they did that?* **(Visualising)** Think about the patterns you have seen when you look at the stars at night. *What did you see?*

**Pages 6 and 7** – Read aloud the heading and ask the students to predict which star might be closest to Earth. *Why do you think it is difficult to study stars? Why do you think studying the sun would help scientists to learn about other stars?*

**Pages 8, 9, 10, and 11** – **(Asking questions)** Point out that this section starts with a question. *What questions would you ask if you were a scientist who studied the sun?* Write the students’ questions on the board.

As the students read these pages, provide support for reading the multisyllabic words (telescopes, photographs). Check that they are thinking about their questions as they read. Remind them that asking questions and searching for answers can help them to understand a text.

## Introducing the book

**Front cover** – **(Asking questions)** Discuss the title and the cover photograph. *What do you know about stars? What questions do you have about stars? Do you think you’ll find the answers in this book? Why?*

**Back cover** – Read aloud the preview question. Discuss the students’ predictions.

**Using the flap** – Read aloud the sentence on the flap, and (if relevant) remind the students that they have read this in *Being a Scientist*. Read aloud the anchor words on the other side of the flap. Tell the students that they can point out the words when they find them in the book. Ask them to leave the flap open as they read the book.

**Title page** – Read aloud the author’s name. *Who might have taken the photograph?*

**Pages 12 and 13** – Refer back to the list of questions. Ask the students if any of their questions have been answered. Discuss the reasons why their questions may or may not be answered, and help them to formulate further questions about stars.

Discuss any unfamiliar vocabulary, showing the students how they can use the glossary or a dictionary to check the meaning of words.

*What other facts about the sun do you know? How do you know if these facts are true?* Discuss how we rely on scientists to prove that something is true, for example, by using photographs taken by telescopes.

**Pages 14 and 15** – Work through the information to ensure the students have understood it. **(Visualising)** If they struggle to make sense of the diagram, compare it with the layers of an onion. Discuss the temperatures inside a star. *Why might the inside be hotter than the outside?*

**Pages 16 and 17** – Observe the students as they read, noticing if they need support with the words or concepts. Refer back to page 12 if the students are having difficulty with understanding “orbit”.

**Pages 18 and 19** – **(Asking questions)** Discuss the comparative sizes of the stars. Ask whether the students have any further questions.

**Pages 20 and 21** – *I wonder how scientists know that stars get smaller every second? Should we be worried that the sun will burn out? Why/why not?*

**Page 23** – *What questions might scientists have? Would you like to be a scientist who studies the stars? Why/why not?*

## Vocabulary activity

### Focus word: discovered (page 8)

1. Turn to page 8 and reread the text. *What have scientists discovered about the sun?*
2. Say “discovered” with me.
3. Explain that discovered means “found” or “learned”. *What facts did you discover when you read this book?*
4. Tell the students to listen carefully as you describe a scenario. *Imagine you are an explorer and you’ve been hiking across the desert for days. You climb a small hill and suddenly you discover something you’ve never seen before. Tell a partner what you discovered.*
5. Prompt the students to use the starter “I discovered ...” as they share their ideas. After a few moments, have one or two students share their responses with the group.
6. *What is the word we’ve been learning that means “found” or “learned”? Say the word with me.*  
Over the next few days, provide similar scenarios and prompt the students to use “discovered” as they share their responses.

## ELL activity

### Language objective: using visuals to connect the visual information, text, and conceptual understanding for English language learners.

- Point to the image on page 3 (the black sky). Read aloud the text.
- *Look at the sky ...* (Point to the sky.) *on a clear night.* Point to “clear”. (Sweep your hand over the sky.) *You can see the stars.* (Point to your eyes and then to “stars”.)
- Go back to “clear”, and say: *There are no clouds.* You could draw a sketch of clouds and then erase or cross them out.
- Point to “clear” and to “stars”. *What can you see on a clear night? When can you see stars?*

## Ideas for revisiting the text

### 1. Review and check

- Listen to the students reread the text. Observe their fluency and confidence with the anchor and the content words.
- Check that the students are able to infer that all stars produce heat and light and that Earth’s distance from the stars affects the amount of heat and light we receive. *Which is stronger – the heat or the light? Why?*
- Review the anchor and content words.
  - Check that the students know what each word means and how the words are used.
  - Discuss the ways that some of these words are used in different contexts, for example:
    - flare (page 11)
    - solar (page 12)
    - core (page 14)
    - giants and dwarfs (page 18).

### 2. Stop and learn

#### a. Decoding/word attack activities

##### BLM – Identifying comparative words

Focus on the use of adjectives to compare similar objects and attributes (see pages 12 to 14 and pages 18 and 19). The students can add endings to the adjectives to make comparisons. They can then write a sentence using adjectives. (ELL students may need help with the instruction words, such as “change.”)

Review the multisyllabic words: Galileo, telescope, universe, faraway, scientists, understand, discovered, factory, photographs, Antares.

- Clap the rhythm of the words (above) to find the number of syllables and where they break.
- Write the number of syllables after each word.

#### b. Comprehension activity

##### BLM – Finding the main ideas

The students can reread *Stars*. They can then identify the main idea of each section of the text. (ELL students may need help with the instruction words, such as “reread” and “write”.)

### c. Writing activities

Choose from the following ideas:

- List the things that would happen if the sun stopped burning.
- Imagine what might happen if the sun was burning out. Write a story full of adventure.
- Write a poem in free form about the sun.
- Brainstorm a list of words for the sun.
- Combine words and phrases to make a poem. Write each word and phrase on a separate line.

### 3. Suggestions for further activities

- The students can research their unanswered questions using the Internet or a library.
- Have the students create a fact chart about telescopes, using the Internet or a library. They could use page 12 of *Stars* as a model.
- Discuss how telescopes have changed since Galileo's time. Put this information in a Venn diagram to indicate what is the same and what is different about these telescopes.