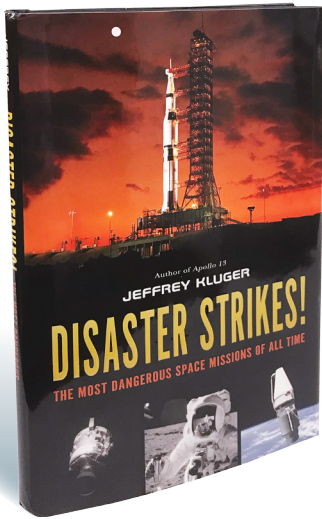


DISASTER STRIKES!

BY JEFFREY KLUGER



In space, just like on Earth, success often means learning from failure. **JEFFREY KLUGER** is a best-selling author and a science editor at *TIME*. His new book for kids, *Disaster Strikes! The Most Dangerous Space Missions of All Time*, is about 12 of the scariest moments in the history of space exploration. In the book, Kluger describes what went wrong during each of these missions and what we learned in the process.

Kluger spoke with TFK Kid Reporter Tiana Sirmans. He hopes the book will help readers understand the courage it takes to be an astronaut, and the role that perseverance plays in exploration. "Every single experiment, every single scientific discovery, is a million mistakes leading up to one great success," Kluger says.

Disaster Strikes! hits shelves May 7.

—By Tiana Sirmans, *TIME for Kids* Kid Reporter

QUICK TIPS TO GET STARTED

As with every book selected for your class, it is important to be aware of the individual dynamics among your students. Whether you choose to use this for read-aloud, book club, or guided reading, you'll want to be prepared.

- 1. Read the book.** Before introducing the book and leading your class in a discussion about it, you should be prepared. Questions will arise, and you'll want to be able to answer them.
- 2. Mark up the text.** While reading, annotate the text to help you go chapter by chapter and decide what questions to ask and how they connect to the overall theme.
- 3. Review nonfiction text features.** Have students do a text-feature walk of the book. Discuss similarities and differences between fiction and nonfiction text features. Make sure students understand how these features support their comprehension of the text.
- 4. Invest your readers.** Remember, part of your role is to hype the book before, while, and after students read it. This will secure their investment in the book and ensure their ability to think critically about it and to answer questions about it.
- 5. Set expectations.** Unlike with a novel, you may choose not to require students to read all the chapters or to read them in order.

ABOUT THE BOOK

- Released in May 2019
- 224 pages
- Ages 8 and up

ABOUT THE AUTHOR

Jeffrey Kluger is an editor at large for *TIME* Magazine and has written more than 40 cover stories for the magazine. He is the author of 11 books, including, *To the Moon!*, *Apollo 13*, and *Apollo 8*. Kluger was only 3 years old when he stepped outside to search the sky for Sputnik, the world's first satellite, and he has been hooked ever since. He has interviewed many astronauts over the years, including his childhood hero, Jim Lovell.

Guiding Questions



In *Disaster Strikes!*, author Jeffrey Kluger introduces readers to 12 of the most dangerous space missions of all time. No two missions of these are alike, and each meets with a disaster of some kind. Yet space exploration has continued, building on the detailed reports, copious notes, and numerous transcripts of each mission. The questions below are intended to be used as an aid to a discussion about the book.

1. Reread the book's introduction. How does the introduction prepare readers to think about the rest of the book? How does the author want you to view the astronauts featured in *Disaster Strikes!*? What evidence supports your thinking?
2. How does the author spark curiosity about space travel?
3. Choose one of the missions described. To what degree was the mission successful? In what ways did it fail? What was learned from this mission? How did it influence future missions?
4. Foreshadowing is a writing technique in which the author gives a hint about what is to come. Find an example in the text and discuss how it adds interest to the chapter.
5. TFK Kid Reporter Tiana Sirmans interviewed author Jeffrey Kluger for *TIME for Kids*. She asked which mission is most memorable for him. Which mission is the most memorable to you? Why is it the most memorable?

Extension Ideas

Illustrating Events

Select an excerpt from a chapter that you or your students found vividly described. Read it aloud to the class. Ask them to close their eyes and visualize the moment. Then ask students to share their visualizations. As do so, sketch the sequence of events on the board. Connect the excerpt to the popularity of graphic novels. If applicable, mention a popular title in your classroom or school library. As a class, determine how to enhance your sketch to mirror the features of a graphic novel (*examples might include inserting word balloons, sound effects, and dividing the action into panels*).

Challenge students to turn a chapter or excerpt of the book into a page from a graphic novel. The text in a graphic novel is minimal, and should be used for important quotes or thoughts. Emotions should be illustrated along with any sound effects. Students may use the resource on page tk to build out their page.

Create a Time Capsule

During the Apollo missions, astronauts collected moon rocks to bring back to Earth. For 50 years, the samples have been sealed off from exposure to Earth's atmosphere. This year, the rocks brought back by Apollos 15, 16, and 17 were made available for analysis. Nine teams were selected to study the rocks for what they can tell us about the geology of the moon.

Explain to students the purpose of time capsules, and discuss how much has changed in 50 years. Then have students brainstorm, on a separate sheet of paper, what they would include in a time capsule to be opened in 2069. Students should include the significance behind each of their choices.

Next, have students narrow down their selection to just one item and write about why they chose that item. Then have them create a representation of their item. Create a classroom time capsule containing the items students have created.

NAME: _____ DATE: _____



Mission Critical

Each chapter of *Disaster Strikes!* describes a different mission. While reading, use these questions to help extract key details about the mission.

1. What is the name of the mission? _____
2. In what year did the mission take place? _____
3. How long did the mission last? _____
4. Was there a flight crew on board? If so, who? _____

5. What was unique, or different, about the mission? _____

6. What was the disaster that struck? _____



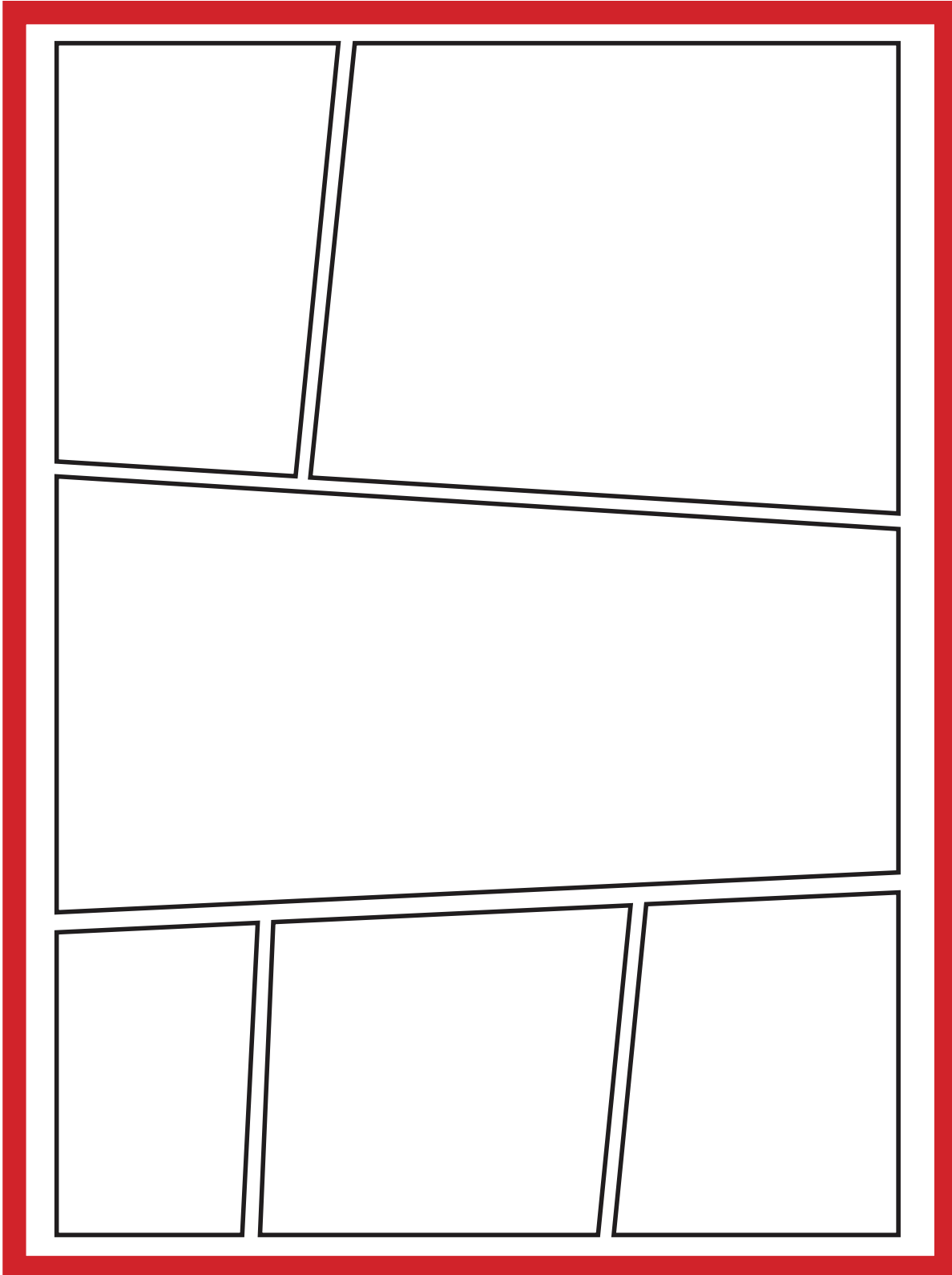
TRY IT! With a partner, read the answers to questions 2 through 6 and have them try to guess the mission you are describing. Then switch, and have a turn at guessing the mission described by your partner.

NAME: _____ DATE: _____



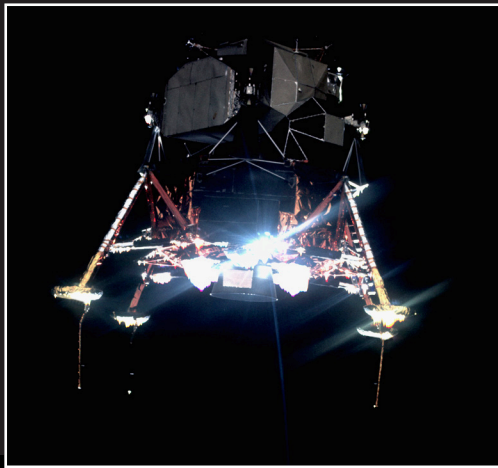
Depicting Danger

Take a chapter or excerpt from the book and turn it into a page for a graphic novel. The text in a graphic novel is minimal, and should be used for important quotes and thoughts. Emotions should be illustrated.



On July 20, 1969, astronauts Neil Armstrong and Buzz Aldrin landed safely on the moon in Eagle, Apollo 11's lunar module. After some tense moments, the module touched down on a flat area NASA had named the Sea of Tranquility. Engineering kept the astronauts inside the module safe and sound. A rocket motor in the lower part of the module slowed the rate of descent. If the module had landed at high speed, it would have crashed and broken apart.

Tell students it's their turn to become engineers. Challenge them to build their own lunar module. Their goal is to construct it so that it can be dropped from a height and land upright without breaking an egg that will be placed inside. Students can use the resource "All Systems Go," on page 7 of this guide, to begin planning the construction of their module. Additionally, they will need the "Lunar Module Rubric" for this activity. You can find this resource under Teaching Materials at timeforkids.com.



This photo shows the Apollo 11 lunar module Eagle, just before its descent to the surface of the Moon.

POTENTIAL MATERIALS

- Raw egg
- Paper
- Toothpick
- Cotton
- String
- Newspaper
- Tape
- Balloon
- Paperclip
- Scissors
- Straw
- Chalk or colored tape to create a drop target
- Cotton ball
- Ruler or yardstick to measure the distance from the target to the impact areas
- Pipe cleaner
- Rubber band

Engineering Design Process

Students will follow the engineering process as they create and test their landers.

1. Ask: What is the problem that needs to be solved?
2. Imagine: Come up with a design that will solve the problem.
3. Plan: Sketch the design. Consider what materials you will need.
4. Create: Build a prototype, or model, of the design.
5. Test: Try out the prototype. Does it work?
6. Improve: How can you improve the design? Repeat steps 3 through 6 as necessary.

NAME: _____ DATE: _____



All Systems Go

Read “Stepping into History” (May 3, 2019). Then use the engineering process to construct a lunar module that can be dropped from a height to land upright without breaking an egg that’s been placed inside.

Goals

Based on the rubric, what goals do you have for your lunar module?

Design

Draw your model below. Label the materials used in your design.

A large, empty rectangular box with a red border, intended for drawing the lunar module design. The box is currently blank.

Explain

Describe why you think your design will be effective in protecting an egg.

Test and Revise

After testing your lunar module, decide what needs to be changed. Complete a new planning sheet with your adjustments, but keep the original to document your revisions.

NAME: _____ DATE: _____



Lunar Module Rubric

This rubric is to be used with the “Moon Landing” activity and the “All Systems Go” resource published with our cover story “Stepping into History” (May 3, 2019).

	Planning and Effort	Design	Egg Survival
0 (Incomplete)	Student(s) did not complete planning sheet, and were off task during the entire project.	Lunar module was not completed.	Lunar module was not tested.
1 (Poor)	Student(s) submitted a sloppy and/or incomplete planning sheet. Student(s) made no adjustments to their designs and were often off task.	Lunar module did not land upright or broke upon landing. Removing the egg required the lunar module to be rebuilt.	Egg fell out of the lunar module or broke.
2 (Fair)	Design planning sheet is mostly complete but is missing important details. Student(s) were off task about half of the time and did not make adjustments to their design.	Lunar module landed sideways or was not neatly constructed according to plan. Opening the lunar module required some parts to be rebuilt.	The egg cracked and might be leaking but is not completely broken.
3 (Good)	Student(s) completed the design planning sheet but it is sloppy. Student(s) were off task occasionally but made adjustments to their design as needed.	Lunar module was neatly done and followed the plan. Lunar module landed upright but might have fallen over upon landing. It remained fully intact upon landing and when the egg was removed.	Eggshell is cracked but not leaking.
4 (Excellent)	Student(s) completed planning sheet with a neatly drawn and labeled model. Student(s) tested their lunar module and made necessary adjustments. Student(s) were on task at all times.	Lunar module is well constructed and followed the planning sheet. The device landed right side up. Lunar module is fully intact upon landing and egg removal.	Egg remained inside the lunar module and completely intact.