APOLLO 13
1. The command module, nicknamed Odyssey
2. The service module, site of the explosion
3. The LEM, used to shuttle the astronauts to and from the surface of the moon
The incredible true story of three astronauts fighting for survival 240,000 miles from Earth.

BY LAUREN TARSHIS

Think about the challenges the astronauts faced.

The three astronauts of Apollo 13 were doomed. That’s how it seemed on April 13, 1970. Commander Jim Lovell and officers Fred Haise and Jack Swigert were speeding through space when a violent explosion rocked their spacecraft. The blast tore apart one side of their ship. Within minutes, half their oxygen supply had bled out, and the ship’s power was draining fast.
Without power and oxygen, the astronauts would soon suffocate. And they would be stranded in the forever blackness of space.

Apollo 13 was supposed to be a research mission to the moon. Now, it would be a fight for survival hundreds of thousands of miles from Earth.

**A Mission to the Moon**

Two days earlier, Apollo 13 had blasted off from Florida's Kennedy Space Center. Lovell, Haise, and Swigert were strapped inside their small spacecraft, which was perched atop a 360-foot-tall rocket packed with millions of pounds of explosive fuel.

*Five, four, three, two, one...*

With a deafening roar and a brilliant flare of fiery gas, the rocket catapulted Apollo 13 into the sky. It streaked through the air at 24,000 miles per hour—14 times the speed of a bullet. The force strained the astronauts' hearts. It stretched back the skin on their faces until it seemed the skin would rip away from their skulls. The men felt as though their bones might shatter.

But this was normal. In fact, the launch was just about perfect.

Soon the astronauts had left Earth and were cruising toward their destination. Their mission was to land on the moon and explore a hilly section called Fra Mauro. They were to gather samples of the moon's sandy dirt and 4-billion-year-old rocks.

First, though, the astronauts had to get there.

The 240,000-mile journey would take three days, and it would not be a luxurious ride. The astronauts were crammed into Apollo 13's command module, a car-sized capsule, nicknamed *Odyssey,* that was part cockpit, part sleeping cabin. Meals were pouches of dried food, prepared by adding warm water and kneading for three minutes. There were no showers, no sinks, no toilets. (The astronauts urinated into bags, and then released their urine into space through a hatch. Solid waste was sealed up in odor-proof plastic bags to be brought back to Earth.) And, of course, there was no gravity to hold the astronauts—or anything else—down. Floating in their jumpsuits, the men looked like big fish stuck in a tiny tank.

But if space travel was uncomfortable, Lovell, Haise, and Swigert never complained. They felt thrilled and honored to be on this mission, and confident they would succeed.

After all, they had a team of brilliant flight engineers supporting them back at Mission Control in Houston, Texas. Like hovering parents, these engineers...
monitored every detail of the flight, from the ship’s position in space to each astronaut’s heartbeat. The astronauts and Mission Control stayed in constant contact.

Two days into the journey, the mission seemed flawless. There was no sign of the catastrophe to come.

Space Race

Only 15 years before the launch of Apollo 13, the idea of humans traveling through space was the stuff of science fiction. Then, on October 4, 1957, Russia shocked the world by successfully launching a satellite, Sputnik 1, into Earth’s orbit.

At the time, America and Russia (then part of the Soviet Union) were sworn enemies. The countries were vying to become the most powerful nation on Earth. Many Americans saw the launch of Sputnik as a national humiliation, a sign that the U.S. had fallen behind.

In the following years, America caught up with Russia and launched its own satellites. Soon the two countries were racing toward a new goal: to put a human being in space.

Leading America’s efforts was a new government agency called the National Aeronautics and Space Administration (NASA). NASA hired hundreds of brilliant scientists and engineers. They perfected rockets powerful enough to blast out of Earth’s orbit. They designed new aircrafts and developed cutting-edge technologies. And they began training astronauts, 20th-century Christopher Colombuses who would journey into the vast and uncharted frontier of space.

Over the next decade, the U.S. and Russia sent dozens of men into space; most came back alive and well. There were tragic accidents, though, like the deaths of three Apollo 1 astronauts in a launch-pad fire in 1967.

The space program became a source of enormous pride to Americans. And there was no moment more triumphant than when, on July 20, 1969, American astronaut Neil Armstrong became the first human
on the moon. Some 600 million people around the world tuned in to the TV broadcast to witness Armstrong’s boot making its mark on the moon’s sandy surface.

In the months after Armstrong’s celebrated step, however, something unexpected happened: Many Americans lost interest in space travel. At the time, the U.S. had big challenges at home. The Vietnam War was claiming the lives of thousands of U.S. soldiers every year. Millions of people were living in poverty. How could the government spend billions of dollars a year on space travel when there were so many problems to solve here on Earth? Besides, after a decade with dozens of successful missions, space travel had come to seem rather ho-hum.

That is, until 55 hours and 53 minutes into the Apollo 13 mission, when disaster struck.

A Catastrophe

On April 13, 1970, Lovell, Haise, and Swigert were preparing for the moon landing, which was about a day away. To get to the moon’s surface, they would use a second spacecraft: the lunar excursion module (LEM). The LEM and Odyssey were latched together like LEGOs. When Apollo 13 arrived in the moon’s orbit, the LEM would be detached and used as a shuttle to and from the moon’s surface.

The astronauts had just finished an inspection of the LEM when Mission Control asked them to perform a routine task: Turn on the fans inside the oxygen tanks. With a flip of a switch, Swigert completed the job.

Seconds later, there was a loud bang. The spacecraft moaned and shuddered.

“Houston, we’ve had a problem,” Lovell said.

In fact, it was a catastrophe. At first, nobody knew what had happened. Lovell suspected a meteor had hit them. Actually, faulty wiring in an oxygen tank had triggered an explosion. The blast drained the spacecraft’s power and sent the oxygen supply venting into space. Within hours, there would be no air left to breathe, and Odyssey would be dead.

News of the accident spread around the world. Predictions were grim. Few believed the astronauts would survive. But aboard Apollo 13, there was no time for dismal predictions. The three men had spent thousands of hours training for this trip. They knew rule number one in an emergency is to focus on the problem. Worry and panic do not get you closer to a solution. And so the astronauts got to work.

Scanning the Sky

At Mission Control in Houston, flight director Gene Kranz gathered his engineers. These men knew Apollo 13’s systems better than they knew their own bedrooms. Now they would do everything in
home would take four days, but the LEM didn’t have enough power or water to last that long. So the astronauts turned off all but the most critical systems, including the heat. Outside, the temperature was 280 degrees below zero. Soon the men were shivering. But the cold was the least of their worries.

Every minute, it seemed, new problems arose. The ship kept drifting off course. The LEM’s air filters stopped working, and the air became toxic with CO₂, the gas humans exhale with every breath.

With many systems damaged or powered down, the engineers had to use their ingenuity to find creative solutions. To correct the spacecraft’s position, they instructed the astronauts to fire the engine in short bursts. To clean the toxic air, the engineers designed a fix for the air filters using materials on board—cardboard from the flight manual, duct tape, and tubing from extra spacesuits.

The days passed. The astronauts barely slept. Neither did the NASA engineers back on Earth. The LEM became cluttered with trash and full urine bags that floated through the air. Meanwhile, on Earth, people crowded into churches to offer prayers for Apollo 13. Outside, they scanned the sky, wondering if the astronauts could make it home.

Free Fall to Earth

Apollo 13 approached Earth on the morning of Friday, April 17. The astronauts were about to face the most perilous part of their ordeal.

their power to bring the astronauts home. Soon, both Kranz’s team and the astronauts had come up with the same idea: to use the LEM as a lifeboat.

The LEM had its own supply of power, oxygen, and water. The astronauts would climb through a hatch into the LEM and stay there until they approached Earth. Then they would climb back into Odyssey for the final plunge through Earth’s atmosphere, during which the ship would be superheated to 5,000 degrees in the thickening air. (Unlike Odyssey, the LEM was not equipped with a heat shield. If the astronauts attempted to enter Earth’s atmosphere in the LEM, they would be incinerated.)

The astronauts had barely settled into the LEM when a new problem cropped up. The journey...
What if Odyssey’s electrical system couldn’t be powered up?
What if Odyssey’s heat shield had been damaged in the explosion?
What if the parachutes had turned to blocks of ice and didn’t open?
Incredibly, the astronauts had no trouble powering up Odyssey.
Even with frozen wires and walls dripping with condensation,
the electrical systems were soon humming.

But what about the heat shield?
If it failed, the ship would burn up.
The world would know the fate of Apollo 13 in four minutes. That’s how long communication with Odyssey would be blacked out as it fell to Earth.

“Gentlemen,” Lovell said.
“We’re about to reenter. I suggest you get ready for a ride.”
The men tightened their seat belts as Odyssey began its 25,000 mph free fall to Earth. Through the small windows, all they could see was fiery red.

At Mission Control, the command room was packed with engineers and visitors. Nobody spoke. The room was completely silent.
The minutes ticked by with agonizing slowness.
One minute.
Two minutes.
Three minutes.
Four minutes . . .

NASA’s Joe Kerwin tried to make contact.
“Odyssey, Houston standing by, over.”
Nothing.
“Try again,” Kranz barked.
“Odyssey, Houston standing by, over.”
Still nothing.
Five minutes.
Some engineers fought back tears.
Then, a voice crackled over the radio.
“OK, Joe,” said Swigert.

At Mission Control, joy and relief flooded the entire room. Kranz pumped his fist.

Inside Odyssey, Lovell, Haise,
and Swigert watched the sky outside the windows turn from angry red to soft pink and finally to blue. Their speed slowed as the air thickened.

Pop.
Odyssey’s parachutes opened.
The ship floated down to Earth, feather-like. It came to rest in the warm waters of the Pacific Ocean.
The Apollo 13 mission was over, a failed mission that would go down in history as one of NASA’s greatest successes.

Lovell looked at Haise and Swigert. “Fellows,” he said, “we’re home.”

**WRITING CONTEST**

The Apollo 13 mission is often described as “a successful failure.” Why might that be? Write a story that uses text evidence to support your answer. Send your response to APOL13@scholastic.com.

Five winners will each get One Small Step for a Commander. See page 2 for details.
Read, Think, Explain
Identifying Nonfiction Elements

Use this activity sheet with “Disaster in Space.” See Scope’s “Glossary of Nonfiction Terms” and “Glossary of Literary Terms” for definitions of the words that appear in bold.

Before Reading
Text Features and Inference

1. Read the headline and study the image on pages 4-5. What mood do they create?

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

2. Look at the photos and read the caption at the top of page 7. Why do you think they were included?

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

3. Study the photograph on page 10 and read the caption. What can you infer the astronauts were feeling when the photograph was taken?

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

4. Read the subheadings in the article. Based on your preview of the article, write one sentence predicting what the article will be mainly about.

_________________________________________________________________________
5. The section “A Mission to the Moon” describes the launch of Apollo 13 and explains that two days into the mission, everything seemed to be going perfectly. At the end of the section, the author writes, “There was no sign of the catastrophe to come” (p. 7).

**Mood** is the feeling the reader gets from a piece of writing. The sentence from page 7 creates a **mood of**
- [A] foreboding.
- [B] excitement.
- [C] disappointment.

6. According to information in the section “A Space Race,” what can you **infer** is the reason that the U.S. wanted to put a man on the moon in 1969?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

7. **Text structure** is the term for how an author organizes information. The author uses a problem-and-solution text structure in the section “Scanning the Sky.” Explain how you can tell.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

8. **Tone** is the author’s attitude toward the subject matter or toward the reader or audience.

Throughout the article, Lauren Tarshis uses an admiring tone when talking about the Apollo 13 astronauts. Which of the following lines from the article BEST shows Tarshis’s admiration for the astronauts?

- [A] “But if space travel was uncomfortable, Lovell, Haise, and Swigert never complained. They felt thrilled and honored to be on this mission…” (p. 6)
- [B] “First, though, the astronauts had to get there.” (p. 7)
- [C] “Meanwhile, on Earth, people crowded into churches to offer prayers for Apollo 13.” (p. 9)
After Reading
Central Idea/Details and Objective Summary

9. A. Below is a central idea of “Disaster in Space” and three supporting details. Two details DO support the central idea. Cross out the detail that DOES NOT.

Central Idea
The engineers at NASA played a very important role in getting the Apollo 13 astronauts home safely.

Detail #1
“To clean the toxic air, the engineers designed a fix for the air filters using materials on board...” (p. 9)

Detail #2
“Predictions were grim. Few believed the astronauts would survive.” (p. 8)

Detail #3
“To correct the spacecraft’s position, they instructed the astronauts to fire the engine in short bursts.” (p. 9)

B. Briefly explain why the detail that you crossed out does NOT support the central idea above.

10. An objective summary is a short statement or paragraph that tells what an article is about. Draw a line through the three sentences below that should definitely NOT be included in an objective summary of “Disaster in Space.”

a. Gene Kranz must have been so relieved when the astronauts landed safely on Earth.

b. On July 20, 1969, American astronaut Neil Armstrong became the first human to walk on the moon.

c. Several days into the Apollo 13 mission, an explosion on the spacecraft drained it of power and oxygen.

d. The engineers at Mission Control helped the Apollo 13 crew solve various problems that arose after the explosion.

e. I would have been terrified if I had been on the spacecraft with the Apollo 13 astronauts.

f. The Odyssey landed safely in the Pacific Ocean and the astronauts survived.
Central Ideas and Details

A central idea of a text is one of the main points the author is making. (Sometimes a central idea is called a main idea.) A central idea can always be supported with details from the text.

Directions: Follow the prompts below to explore the central ideas and supporting details in “Disaster in Space.”

1. Read the central idea of the section “Scanning the Sky” stated in the box below. Then check the boxes next to THREE details that help support this central idea.

   Central Idea:
   The engineers at NASA played an important role in getting the Apollo 13 astronauts home safely.

   □ A. When the LEM kept veering off course, the NASA engineers instructed the astronauts to fire the engine in short bursts to correct the LEM’s position.
   □ B. When they faced a disaster, the Apollo 13 astronauts did not panic.
   □ C. Onboard the LEM, the Apollo 13 astronauts turned off all noncritical systems to save power.
   □ D. The engineers at NASA barely slept as the Apollo 13 crew journeyed back to Earth.
   □ E. When the LEM’s air filters broke, the NASA engineers came up with a fix that the astronauts could create using materials on board.

2. Read the details below. In the box, complete the central idea that these details support.

   Central Idea:
   The explosion on the Apollo 13 spaceship ____________________________

   Detail 1: “Within minutes, half their oxygen supply had bled out and the ship’s power was draining fast.” (p. 5)

   Detail 2: “Predictions were grim. Few believed the astronauts would survive.” (p. 8)

   Detail 3: “Apollo 13 was supposed to be a research mission to the moon. Now it would be a fight for survival hundreds of thousands of miles from Earth.” (p. 6)
Summarizing

An objective summary is a short statement or paragraph that tells what an article or a story is about. It does not include unimportant details or the opinions of the person writing it.

Directions: Follow the prompts in the margins to complete the summary of “Disaster in Space.”

On April 13, 1970, the Apollo 13 spaceship and its crew blasted off into space. They were headed ______________________. After 55 hours and 53 minutes, ______________________.

The explosion caused ______________________. The astronauts and NASA’s Mission Control engineers quickly came up with a plan. The astronauts would move into the LEM, which ______________________, until they approached Earth. Then they would ______________________. However, the astronauts’ problems were far from over; on the LEM, ______________________. But Mission Control and the astronauts worked together and successfully solved each problem. Against all odds, ______________________.

1. Where was the spacecraft going?
2. What happened on the spacecraft?
3. What problem did the explosion cause?
4. Why did they decide to move into the LEM?
5. How would the astronauts reach Earth?
6. What problems did the astronauts encounter on the LEM?
7. What happened to the astronauts?
Exploring Mood

Mood is the feeling you get from reading a piece of writing. Another way to describe mood is atmosphere. When you walk into a place, it has an atmosphere that makes you feel a certain way; when you “walk into” a story, it too has an atmosphere that creates a feeling. Writers create mood through word choice, imagery, dialogue, setting, and plot.

In this activity, you will consider the mood of a passage from “Disaster in Space” by Lauren Tarshis. Here is the passage, which is from page 6 in the section “A Mission to the Moon”:

Two days earlier, Apollo 13 had blasted off from Florida’s Kennedy Space Center. Lovell, Haise, and Swigert were strapped inside their small spacecraft, which was perched atop a 360-foot-tall rocket packed with millions of pounds of explosive fuel.

Five, four, three, two, one . . .

With a deafening roar and a brilliant flare of fiery gas, the rocket catapulted Apollo 13 into the sky. It streaked through the air at 24,000 miles per hour—14 times the speed of a bullet. The force strained the astronauts’ hearts. It stretched back the skin on their faces until it seemed the skin would rip away from their skulls. The men felt as though their bones might shatter.

But this was all normal. In fact, the launch was just about perfect.

Soon the astronauts had left Earth and were cruising toward their destination. Their mission was to land on the moon and explore a hilly section called Fra Mauro. They were to gather samples of the moon’s sandy dirt and 4-billion-year-old rocks.

First, though, the astronauts had to get there.

Here are two words that could be used to describe the mood of the passage:

intense, dangerous

Now let’s look at what creates this mood.
The Situation

One thing that makes the mood intense and dangerous is the situation—in other words, what happens.

1. In 1-2 sentences, summarize what Tarshis describes in the passage from page 6 of the article.

Descriptive Details

It’s not just the situation that gives the passage an intense and dangerous mood. The way Tarshis brings the situation to life also helps to create the mood. Let’s take a look at some of her descriptive details.

2. Sentences: “Lovell, Haise, and Swigert were strapped inside their small spacecraft, which was perched atop a 360-foot-tall rocket packed with millions of pounds of explosive fuel. *Five, four, three, two, one...*”

Check the TWO statements that best explain how the sentences above create a feeling of danger.

☐ A. The liftoff countdown (“*Five, four, three, two, one...*”) draws out the moments before the ship blasts off. This creates suspense and tension, which increases the intensity and the feeling of danger.

☐ B. Tarshis writes that the fuel tank was completely full. This creates a feeling of danger.

☐ C. When Tarshis describes “a small spacecraft... perched atop the 360-foot-tall rocket,” she creates an image of the spacecraft as tiny and fragile. It doesn’t sound like the astronauts are well-protected from the powerful rocket below them.

3. Sentence: “With a deafening roar and a brilliant flare of fiery gas, the rocket catapulted Apollo 13 into the sky.”

Check the TWO statements that best explain how Tarshis’s word choice in this sentence creates a mood of either intensity or danger.

☐ A. Tarshis’s use of “catapulted” to describe the rocket sending Apollo 13 into the air causes readers to imagine the feeling of being shot into space with great force and power—a very intense and perhaps frightening feeling.

☐ B. When Tarshis writes “with a deafening roar,” the reader can imagine how intense the sound was as the ship lifted off.

☐ C. Tarshis includes the name of the spaceship—Apollo 13—in her description. This creates a feeling of danger.
4. Sentence: “It stretched back the skin on their faces until it seemed the skin would rip away from their skulls.”

Write one statement explaining how this sentence creates a feeling of intensity and/or a feeling of danger.
Exploring Text Structures

“Text structure” is the term for how an author organizes information. Authors use different text structures to achieve different purposes, and one piece of writing often has multiple text structures.

Directions: Common text structures are listed in the boxes on the right. Use the information in these boxes to help you answer the questions below about the text structures in “Disaster in Space.”

1. The author uses **description** in the section “A Mission to the Moon.” What is the author describing?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

2. A. In the section “Something Unexpected,” the author explains why many Americans lost interest in space travel. Circle the text structure she used to do this.

   *problem and solution*    *cause and effect*

B. Explain how you know, using evidence from the text.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Description or List
Includes details to help you picture or get to know a person, a place, a thing, or an idea

Cause and Effect
Explains why something happened (cause) and what happened as a result (effect)

Problem and Solution
Presents a problem and explains how it is solved

Compare and Contrast
Presents the similarities and/or differences between two items, such as a pair of events, time periods, ideas, or places

Sequence of Events
Describes events in the order in which they happen (also called chronological order)
3. The section "Scanning the Sky" presents solutions to the problems the Apollo 13 astronauts encountered during their mission. Write two problem-solution pairs below.

Problem 1: ____________________________________________

_________________________________________________________

Solution 1: ____________________________________________

_________________________________________________________

Problem 2: ____________________________________________

_________________________________________________________

Solution 2: ____________________________________________

_________________________________________________________

4. A. In the last section, "Free Fall to Earth," the author describes the events of the morning of April 17, 1970. Which text structure does she use?

_________________________________________________________

B. Explain how you know, using evidence from the text.

_________________________________________________________

_________________________________________________________

C. The mood of this section is suspenseful. How does the text structure you identified help the writer create suspense?

_________________________________________________________

_________________________________________________________
"Disaster in Space" Quiz

Directions: Read "Disaster in Space." Then answer the questions below.

1. The opening section of the article describes an emergency. Which section of the article explains what caused this emergency?
   A. "A Mission to the Moon"
   B. "A Space Race"
   C. "Something Unexpected"
   D. "A Catastrophe"

2. According to the article, how did competition between Russia and the U.S. affect space travel?
   A. It sped up the progress of space travel.
   B. It caused the U.S. to take dangerous risks in early space travel.
   C. It slowed down the progress of space travel.
   D. It caused Americans to lose interest in space travel.

3. Which line from the text best supports your answer to question 2?
   A. "At the time, America and Russia (then part of the Soviet Union) were sworn enemies." (p. 7)
   B. "The countries were vying to become the most powerful nation on Earth." (p. 7)
   C. "Soon the two countries were racing toward a new goal: to put a human being in space." (p. 7)
   D. "...Many Americans lost interest in space travel." (p. 8)

4. On page 8, author Lauren Tarshis explains that at the time of the Apollo 13 mission, Americans' interest in space travel was low. Why was it low?
   A. Americans thought Russia was too involved.
   B. Americans were more focused on problems like war and poverty.
   C. Americans didn't think it was possible to walk on the moon again.
   D. Americans were worried about the danger of the Apollo 13 mission.

5. On page 8, Tarshis writes, "These men knew Apollo 13's systems better than they knew their own bedrooms." Tarshis is saying that the engineers
   A. did not know Apollo 13's systems well.
   B. knew Apollo 13's systems very well.
   C. did not know their bedrooms well.
   D. worked so much that they hardly slept.

6. Tarshis wrote "Disaster in Space" mainly to
   A. convince readers that we should stop sending people into space.
   B. teach readers how to handle an accident aboard a spacecraft.
   C. inspire and amaze readers with a story about human survival.
   D. inform readers about the science of space travel.

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**Constructed-Response Questions**

Directions: Write your answers to the questions below on the back of this paper or type them up on a computer.

7. The section "Free Fall to Earth" is full of tension (a feeling of worry). Describe one way author Lauren Tarshis helps create this tension. Use text evidence.

8. Think about how the astronauts and engineers handled the explosion on Apollo 13. What can we learn from them about how to handle an emergency? Support your ideas with text evidence.