

PBS Lesson Series

ELA, Grade 3, Lesson 9

Teacher Packet

Part Two: Liftoff



My wait ended at last on April 12, 1985. I boarded the shuttle *Discovery* on a cloudy morning with six crewmates. None of us had packed much for our trip. NASA gave us our clothes and food.



blastoff!

If you ever go to a shuttle liftoff, I hope you remember your earplugs! The roar of the engines and rockets can be heard from miles away. To protect their ears, astronauts wear helmets. The helmets also have headsets, which are used to keep in touch with mission control in Houston. Mission control plays a major role during every spaceflight by tracking the shuttle as it moves.

Reaching space takes only about eight and a half minutes. When the shuttle's two **boosters** fire and the three main engines light up, it is one amazing ride! After two minutes and thirty seconds, the *Discovery's* boosters popped off with a bang. During that time, I listened closely to mission control.



We were allowed to bring only two of our own things on the spaceflight. I brought along a photo of my family and a Tennessee bumper sticker to remind me of home.

I had faith that the engines would hold together and work correctly. My biggest fear was failing in my work and letting NASA down.

Six minutes later, at 200 miles above Earth and going 17,500 miles per hour, the engines cut off. Our crew waited excitedly to feel weightlessness and hear our commander say, "Welcome to space!"



the Nile River in Africa, at night

rocket
booster

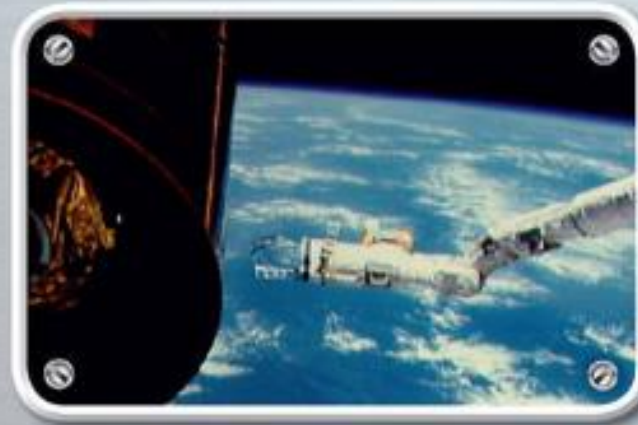


Part Three: The Mission



Our main job on this mission would be to launch two **satellites**. Satellites are machines that share information over thousands—even millions—of miles. They allow people on Earth to have television, radio, and the Internet. Like most machines, satellites have "on" and "off" switches. Our two satellites were supposed to flip on once we released them into space. Nothing to it, right?

Not exactly. When you're many miles above Earth, nothing is as simple as it might seem. One satellite worked. Unfortunately, the other wouldn't turn on. We couldn't leave the broken satellite without trying to fix it. Now was the time to think like a doctor and put my surgery skills to use.



my view from the shuttle

To move the “on” switch on the side of the satellite, we would need a hand. This wouldn't be a human hand, but a set of tools. First these tools would be attached to a long, robotic arm. I could control the arm from inside the shuttle and use the hand to knock the switch into the “on” position. In the 1980s, mission control was not yet able to send videos and pictures to astronauts. They could only send words through a special printer on the shuttle. Using the letters of the alphabet to create shapes, they drew a rough picture of the tools we needed. One piece looked like a stick with a pouch. The other was kind of like a flyswatter. We already had the first piece, but it was up to us to put together the space flyswatter. Time for a **scavenger hunt** ...



me with
my fellow
astronauts
and the
“flyswatter”

14 **scavenger hunt** a game where groups of people try to acquire specific items from a list, usually for free, within a time limit

In the front of the shuttle, we kept a thin, metal tube, useful for pressing switches when we were in our seats. It might work as the flyswatter's handle. What about the “swatting” piece? Plastic book covers had the right shape. I started sewing the covers together, using the needle that we kept to fix space suits. I'd stitched up plenty of patients after surgery. How much harder could this sewing job be?



My early training in sewing came in handy
in my careers as a doctor and astronaut!

15

Making our flyswatter was the first part of the puzzle. Next we needed to fasten our tools to the end of the arm. It had not been NASA's plan for anyone to go outside of the shuttle on this trip, but we didn't have much choice. My crewmates David Griggs and Jeff Hoffman, who had trained a great deal for space walks, went out into the darkness. Carefully, they strapped the hand to the end of the arm. Once they had safely returned, I began operating the arm.



*my makeshift
arm with the
"flyswatter"
attached*

Bo Bobko, our commander, and pilot Don Williams flew close to the broken satellite. After a few heavy swats, we could see that the switch was in the "on" position. Success! We waited for the machine to buzz into action, but ... nothing happened. Nobody wanted to give up. Yet we knew we had other important jobs to do. Mission control said we had to move on. On a later shuttle trip, the satellite would be **retrieved** by another crew, rewired, and sent on its way.

Key Details

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Lastly, the first satellite worked, but the second one would not turn on. Dr. Seddon and the astronauts made makeshift tools to turn on the switch, but it did not work, so NASA retrieved the broken satellite later.