

LEVELED Book • V

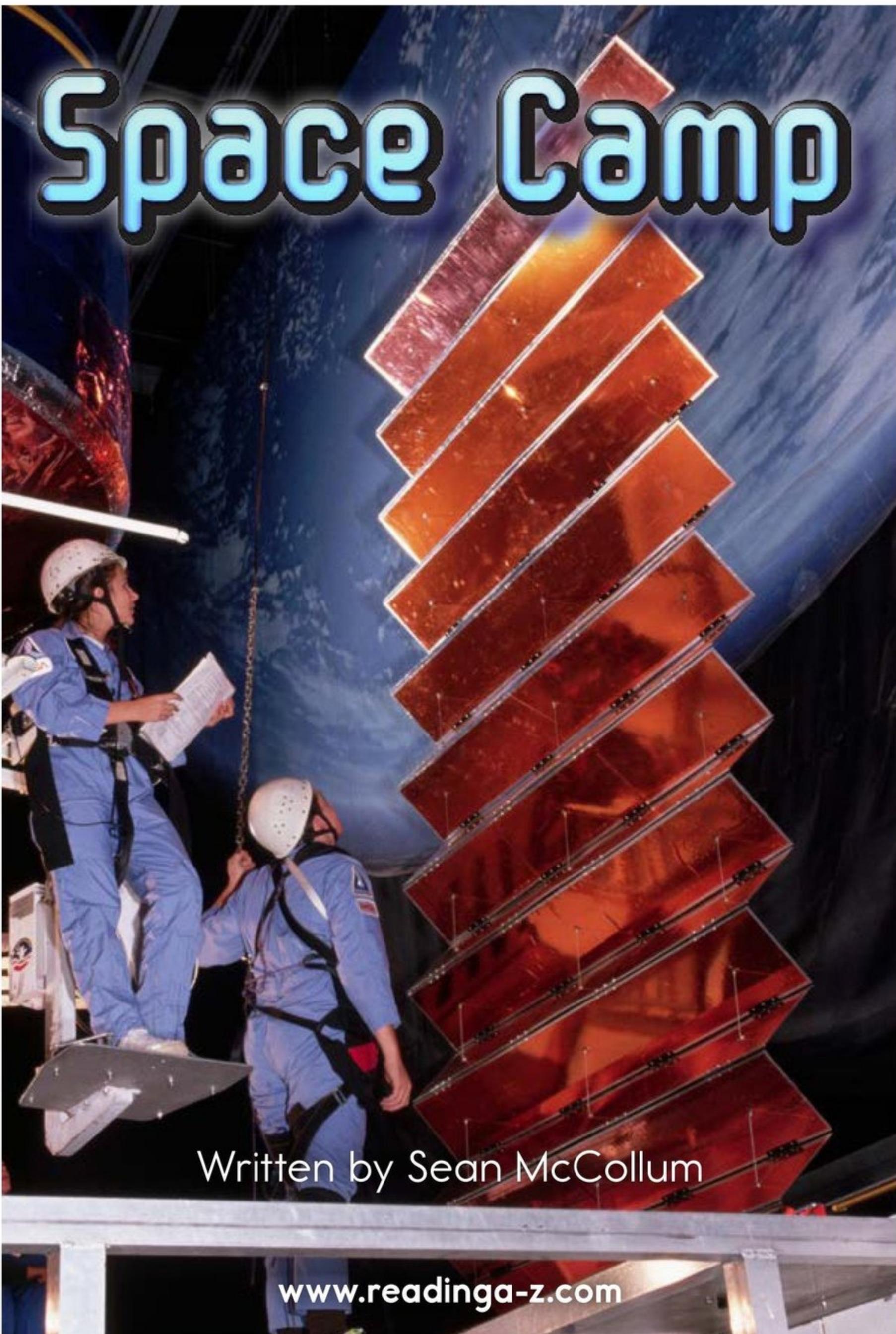
Space Camp

MULTI
level
S•V•Y

Written by Sean McCollum

www.readinga-z.com

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Focus Question

Why do people want to attend space camp?

Words to Know

aeronautics
counselors
exploration
g's
impairments
leadership

mock
rovers
simulators
spacecraft
technology
trainees

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Correlation

LEVEL V	
Fountas & Pinnell	R
Reading Recovery	40
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Table of Contents

Introduction: From Space Camp to Space	4
Space Camps Around the World	6
Going to Space Camp	8
Astronaut Training	10
<i>The Multi-Axis Trainer</i>	10
<i>The 1/6 Gravity Chair</i>	11
<i>The Space Shot and G-Force Accelerator</i>	12
Simulated Missions	13
Astronauts of the Future?	15
Glossary	16

Introduction: From Space Camp to Space

In 1990, sixth grader Kate Rubins went off to camp in Huntsville, Alabama. The camp she attended wasn't the kind of place where she built campfires or paddled a canoe, though. This was space camp. It was an in-depth program about the science and excitement of space **exploration**. She had told her parents that she dreamed of becoming an "astronaut, and biologist, and geologist—in that order."



The "habitat" where campers stay at United States Space Camp in Huntsville, Alabama



Takuya Onishi, Anatoly Ivanishin, and Kate Rubins fly to the ISS in July 2016.

Fast-forward twenty-six years to 2016. A group of young **trainees** took their seats in an IMAX theater at that same space camp. They watched in awe as the screen showed the live video feed of a real liftoff of a giant Russian rocket. On board were supplies and fresh crew for the International Space Station (ISS). The ISS orbits more than 322 kilometers (200 mi.) above Earth.

Watching the launch was particularly special for these space camp trainees. One of the three astronauts on board was Dr. Kate Rubins. She was the same girl who had attended that camp in her youth. For years she had worked as a biologist before starting to train with the National **Aeronautics** and Space Administration (NASA). Finally, she was blasting off to serve on a four-month mission on the ISS. She had fulfilled her childhood dream of becoming an astronaut.



The Pathfinder is a model of a space shuttle that is on permanent display near the space camp in Alabama.

Space Camps Around the World

Space camps allow participants to learn about space science. Programs teach about the history of space exploration. Hands-on projects focus on **technology** used in space. Campers also experience astronaut training. They get to try out equipment astronauts use to prepare for their missions.

Today, space camps have taken off in many places. The camp in Huntsville, Alabama, is located near the United States Space and Rocket Center. There, space camp trainees can see the giant rockets and space capsules that helped NASA astronauts reach the Moon in 1969. More than 750,000 trainees have attended that space camp since it opened in 1982. They have come from all fifty states in the United States and more than sixty other countries.

Some universities and museums in the United States host space camps during school breaks. Children can attend space camp at the Frontiers of Flight Museum in Texas. In Florida, there is Camp Kennedy Space Center. In Washington, D.C., the Smithsonian Association hosts several summer day camps. They offer space-related activities for children as young as kindergarten age.

Space camps are also popular around the globe. In Quebec, Canada, the Cosmodome hosts three-day camps. It offers many other space-related programs, too. Space Camp Turkey is located in Izmir, one of Turkey's biggest cities. Russian Space Camp includes talks about the country's amazing history of space exploration. The center honors Yuri Gagarin, who became the first human to fly into space in 1961.



Going to Space Camp

Space camps are available to nearly everyone who is interested. At some camps, younger children can participate with their family. Camps for older kids are grouped by age. Some space camps hold sessions for trainees with special needs, such as visual and hearing **impairments**.

Space camps mostly concentrate on the history, science, and technology of space travel. At many space camps, trainees study rocketry. They build and launch their own model rockets. At others, they study **spacecraft** design. Then they create their own ship for a space mission.

A Day at Space Camp

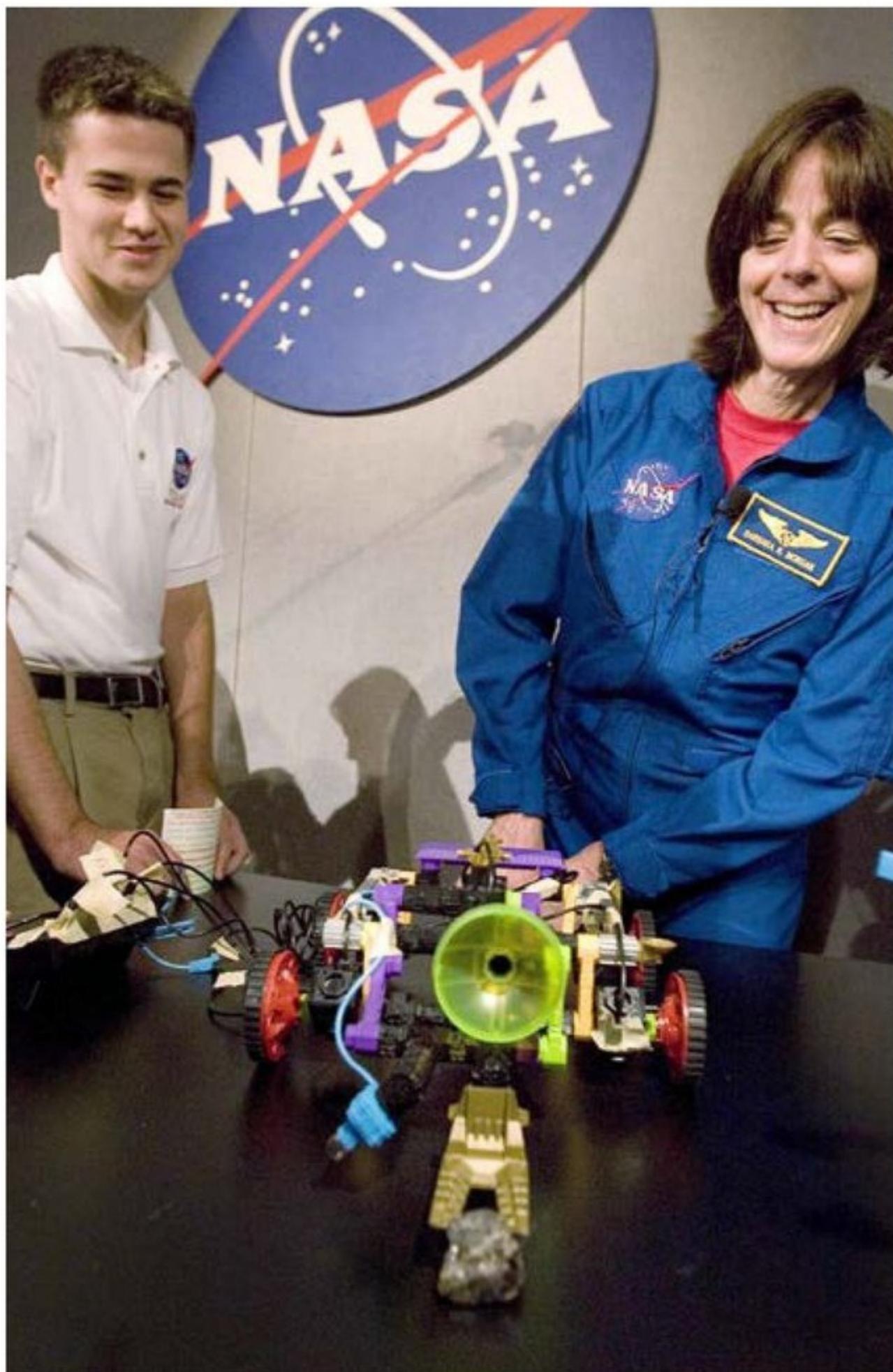
Below is an example of a day in the life of a space camper.

TIME	ACTIVITIES
8:00–9:00 AM	Get ready and eat breakfast
9:00–10:00 AM	Ride simulators
10:00–11:30 AM	Leadership and team-building activities
11:30–12:00 noon	Lunch in the crew galley
12:30–1:30 PM	Astronaut training simulator
1:30–3:00 PM	Rocket construction
3:00–4:00 PM	Movie showing
4:00–5:00 PM	Simulated mission training
5:30–6:00 PM	Dinner
6:30–7:30 PM	Learn about spaceflight history
7:30–8:30 PM	Engineering workshop
9:00–10:00 PM	Call home and prep for bed

Space camps that focus on robotics are also popular. Robotics has become an important part of space exploration. The Opportunity and Spirit **rovers**, which have explored Mars, are prime examples. Robotics trainees build robots to solve real-world problems. Teams may face off in a robotics competition at the end of camp.

Children aren't having all the fun, though. Many space camps host adults from around

the world. Some science teachers attend so they can bring new lessons back to their schools to energize future space explorers.



A NASA astronaut and educator test-drives a robotic rover built in a space camp program.



The MAT is designed so that trainees should not become nauseated or dizzy while riding.

Astronaut Training

Among the favorite activities at some space camps are **simulators**. Astronauts must practice for every situation they might deal with in space. For trainees, this equipment lets them experience some of the challenges astronauts face. While on the simulators, trainees are always under the watchful care of camp **counselors**.

The Multi-Axis Trainer

The Multi-Axis Trainer (MAT) was used in the early 1960s to test the first astronauts. It let them practice regaining command of a space capsule that was tumbling out of control. The MAT is a big metal ring set within a larger ring. The trainee is strapped in a seat in the center ring. Then the two rings spin wildly in different directions.

The 1/6 Gravity Chair

This simulator lets trainees feel the sensation of bounding around on the Moon. There, gravity is one-sixth that of Earth. The gravity chair helps trainees get used to moving around when their bodies feel much lighter than normal.



The 1/6 Gravity Chair is modeled after a similar chair astronauts used for moonwalk training.

Math Minute

If a person weighs 27 kilograms (59.5 lb.) on Earth, how much would that person weigh on the Moon?

Answer: 4.5 kilograms (10 lb.)

8=3+5+2= 14x2-3=25-5-5+2=3+5+2=10-4+10÷2=8x2+6=22-19=3-1+2x2=8x2=1
6-1÷5=3+9x2÷8=3+5+2
20÷2-7=16-1÷5=3+9x2÷8=1
10+8+10÷2=14x2-3=25-5-5+2=3+5+2=10+8+10÷2=14x2-3=25-5-5+2=17+3x2-
=10+8+10÷2=14x2-3=25-5-5+2=3+5+2=10+8+10÷2=14x2-3=25-5-5+2=17+3x2-

The Space Shot and G-Force Accelerator

Anyone who has ridden a roller coaster will recognize the sensation these rides create. The Space Shot shoots riders upward at a rate of four g's, or four times the force of Earth's gravity. Another way to think of it is that if you weigh 23 kilograms (50.7 lb.), you will feel as though you weigh 92 kilograms (202.8 lb.) while riding the Space Shot.

The G-Force Accelerator is a spinning ride. It creates a force that pushes against the body due to the fast speed at which it spins. The G-Force Accelerator reaches three times the force of Earth's gravity, or three g's. That is the same force astronauts feel during a rocket launch.



The Space Shot shoots riders 42.7 meters (140 ft.) high in 2.5 seconds.

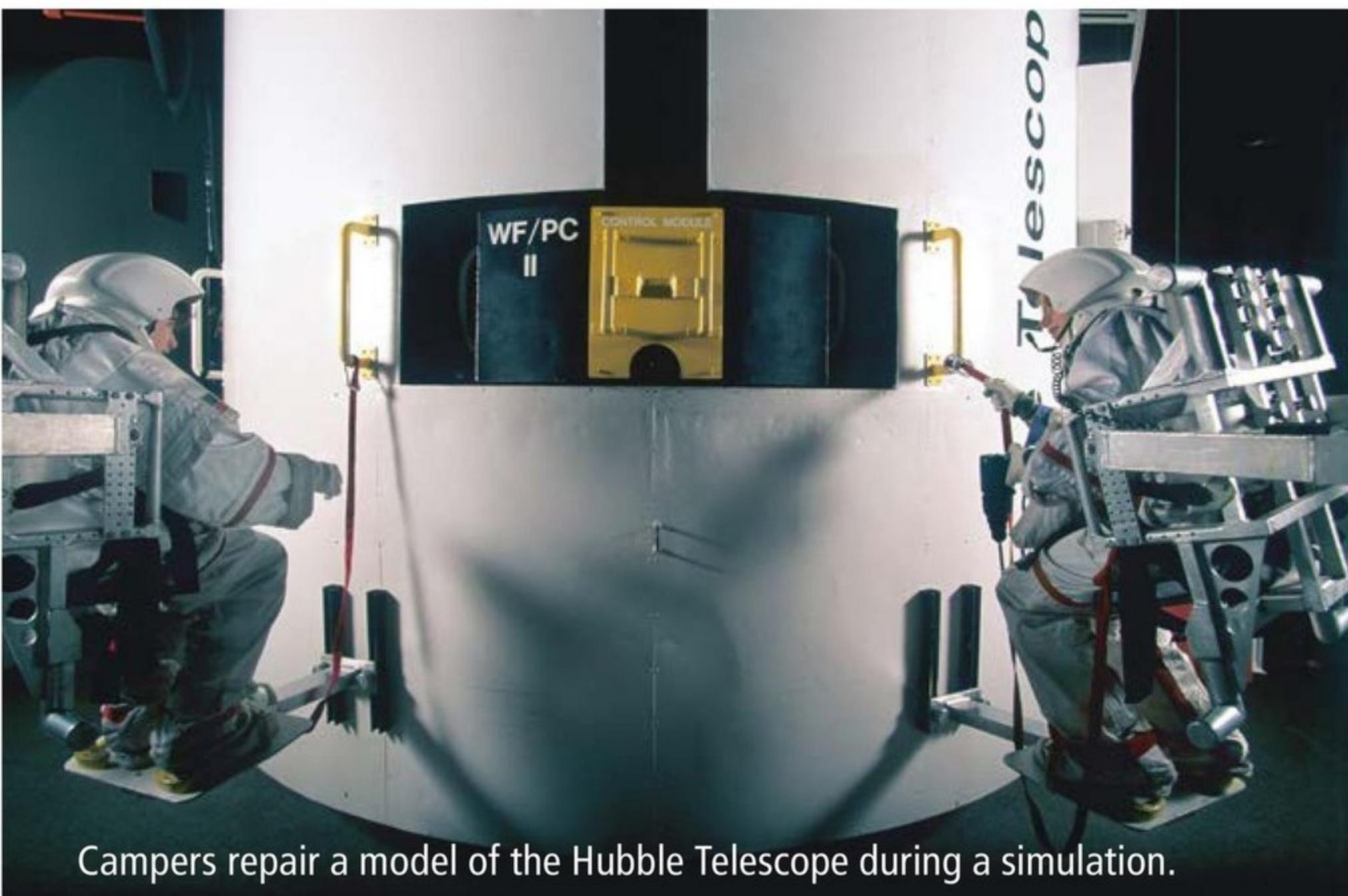


Some trainees work inside the simulators and operate controls as if they are flying a shuttle.

Simulated Missions

Another highlight at many camps is simulated space missions. Teamwork and **leadership** are important qualities in real astronauts. Mission simulators allow trainees to practice both skills. At some camps, they even take part in video game-like simulations.

One mission has participants launch the shuttle. They fly it to the International Space Station and dock with the ISS. Team members perform a variety of duties, but they must communicate on their headsets. Just like a real crew, they run through checklists. These lists ensure that they remember exactly what to do and when to do it. Some trainees work as astronauts. Others work in Mission Control, the command center back “on Earth.”



Campers repair a model of the Hubble Telescope during a simulation.

Some simulated missions include **mock** voyages to the Moon. Others take place on models of a space station. The crew must be prepared to think fast if the simulator creates an emergency. For example, they might have to deal with a simulated engine problem or sudden meteor shower.

For older trainees, a few space camps have created simulations for the future. These include a mission to Mars. Crews work together aboard life-size models of the *Orion* capsule and a Mars lander at the space camp in Alabama. Real astronauts will live on *Orion* during the planned voyage to and from Mars. They will use the lander to fly to the Martian surface and return to *Orion* in orbit.

Space Camp Heroes

Here are a few astronauts and scientists who have either graduated from space camps or supported programs that help young people learn about space.

- Dr. Leroy Chiao: This veteran NASA astronaut is now head of the Houston Association for Space and Science Education. Chiao does live-streaming visits with students and trainees around the world.
- Bobak Ferdowsi: An aeronautical and astronautical engineer, Ferdowsi is planning a future mission to send a robotic probe to Europa, one of Jupiter's moons.
- Samantha Cristoforetti: This space camp trainee became a fighter pilot for Italy's air force. In 2014–2015, Cristoforetti served on the ISS for 199 days.
- Robert "Hoot" Gibson: Robert Gibson, a big supporter of space camps, is a veteran of five space shuttle missions in the 1980s and 1990s.
- Michael E. Lopez-Alegria: Michael Lopez-Alegria served on four space shuttle missions. He has also been a speaker at Space Camp Turkey.

Astronauts of the Future?

Much like Dr. Kate Rubins, today's trainees from space camps around the world may be the astronauts of tomorrow. NASA is collaborating with other space programs to plan a mission to Mars. They hope the mission will take place as soon as the 2030s. If everything goes as planned, current space camp trainees could one day be some of the astronauts on board the *Orion*. They could be the first people to leave footprints in the soil of the Red Planet. They will continue humanity's reach for the stars.

Glossary

aeronautics (<i>n.</i>)	the science and practice of flight (p. 5)
counselors (<i>n.</i>)	people who supervise at a camp (p. 10)
exploration (<i>n.</i>)	a journey through unfamiliar territory to learn more about it (p. 4)
g's (<i>n.</i>)	units of force that equal gravity's pull on an object at Earth's surface (p. 12)
impairments (<i>n.</i>)	conditions in which certain faculties are damaged or not working well (p. 8)
leadership (<i>n.</i>)	the ability to guide and direct other people (p. 13)
mock (<i>adj.</i>)	not real; done for practice or as a simulation (p. 14)
rovers (<i>n.</i>)	vehicles used to explore the surface of objects in space, such as planets or moons (p. 9)
simulators (<i>n.</i>)	machines that model or imitate the appearance or condition of something, usually for training or practice (p. 10)
spacecraft (<i>n.</i>)	a vehicle used for traveling in space (p. 8)
technology (<i>n.</i>)	scientific knowledge or tools to make or do something (p. 6)
trainees (<i>n.</i>)	people who are being taught a particular job (p. 5)

Space Camp

A Reading A-Z Level V Leveled Book

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Connections

Writing

Pretend you are attending space camp. Write a letter to a friend telling him or her about your experiences. Be sure to include details from the book.

Science

Research a space mission. Make a brochure about the mission, including its goal, what resulted from it, and other important information. Present your brochure to the class.



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