

Grade 5 Informational

Life Inside the Space Shuttle

"Five, four, three, two, one. . . ." The engines fire with a thundering blast that sends the 4.5-million-pound space shuttle up, up, up. Forty-five minutes later, the astronauts are in a high orbit, circling the planet Earth. They stare out at the globe hanging in space below them. For the next two weeks, the shuttle will be their only home.

To live in space, astronauts need many of the same things a person on Earth requires. They must have oxygen, food, water, exercise, and sleep. But how do astronauts pack oxygen? And what is their daily life like?

Take a Deep Breath

The air on Earth contains a variety of different gases. But nitrogen and oxygen make up 99 percent of our atmosphere. However, the crew can't pack actual air. Instead, tanks of liquid nitrogen and oxygen are taken along. Then a system inside the shuttle mixes these gases together, and fans help the air move through the crew's cabin. Now the astronauts can all take deep breaths whenever they need to!

What's for Lunch?

Eating in space is more challenging than lunchtime on Earth. In space, the food can float away! Because of this, the astronauts use trays to hold their food containers in place. The trays also can be strapped to their laps or attached to a wall. Crew members eat with their own sets of silverware, and they're in charge of wiping the silverware clean after the meal. Everyone has a pair of scissors, too. Why? Scissors are needed to cut open food bags.

What's inside those food pouches? Some of the food is the same type you snack on—nuts, cookies, or granola bars. Other food has been specially prepared for space travel. The water is removed, so the food weighs less and lasts longer. For instance, scrambled eggs and spaghetti are processed this way. Before such food is eaten, the astronaut adds water to it. An oven is available to heat the meal, too!

But there is no refrigerator aboard the shuttle to keep food fresh. As a result, some foods are put through a heat process before they're packaged. This stops them from spoiling. Foods that go through the heat process include servings of tomatoes, ham, chicken, and pudding.

The astronauts also munch on tortillas instead of bread. Why are tortillas so popular? They don't make crumbs. Crumbs could cause problems. They could float off and stick inside air vents or other equipment. Salt and pepper might float off, too, so the astronauts use liquid salt and pepper!

Thirsty? Powdered drinks come in bags. The astronaut has to add water to mix his or her coffee, tea, or milk. Then a straw is used to poke a hole in the bag and sip the drink. If the astronaut wants to save some for later, the straw closes in the middle to safely store the drink.

Staying in Shape

Do astronauts really need to exercise? Yes, it's very important! Why? There is no gravity, so the astronauts float around inside the shuttle. They don't need to use their leg muscles to stand. Soon these muscles will begin to grow weak the same way muscles do when an arm or leg is inside a cast.

To prevent this from happening, astronauts exercise for thirty minutes each day. They have either a treadmill or an exercise bicycle to use. The crew must select the piece of equipment to bring on the mission. Crew members also have large rubber bands made for exercising. They can pull against them to work their muscles.

Good Night, Sleep Tight

Astronauts really do sleep tight—they have to strap themselves inside their sleeping bags! Otherwise they would float around in the cabin. They might bump into each other or the equipment.

The sleeping bags are zippered to pads. Elastic straps pull the astronaut against the pad. The pressure helps to make the pad feel more like a mattress when there is no gravity to pull the body down. Astronauts can even strap their heads to their pillows if they choose.

Zero gravity is not the only challenge to getting a good night's rest. Motion sickness and excitement can make a person's stomach flop. Also, the shuttle is not a quiet place. Fans whir and pumps make noise. A crew member might even snore! To add to that, every ninety minutes the sun rises and shines through the windows. How do the astronauts handle these problems? They have eyeshades and earplugs!

Time for Work

Life aboard the shuttle keeps the astronauts busy. Sometimes they have special jobs to do. They may have to capture a satellite or release one into space. One famous satellite released by a shuttle was the Hubble Space Telescope. Astronauts also perform experiments. Many of the experiments help scientists better understand how gravity affects the human body.

Time for Play

Not all the astronauts' time is spent working. Can you guess what their favorite fun activity might be? It is looking out the window! The astronauts can watch sunrises and sunsets, shooting stars, and lightning storms. They can see the reddish color of Australia and

the sandy yellow deserts of Africa. From the shuttle, they get a two-hundred-mile-high view!

Today, people live not only aboard the space shuttle, but also on space stations. Here they spend ever-increasing amounts of time! Are you ready for the challenges of life in space?

Grade 5 Narrative

Wagon Wheel Tracks

Miles grinned when Ms. Hennessey announced a history project about the Oregon Trail. He knew entering the words "Oregon Trail" into a computer search engine would produce a large amount of information. He thought he would be able to finish the project quickly. Then he would be able to start reading his new mystery book. As Miles listened to Ms. Hennessey, he realized that the project would require more work than he had expected.

"We are fortunate to live near Chimney Rock National Monument," stated Ms. Hennessey. "Tracks carved in the earth by covered wagons more than 150 years ago are still visible. We are going to gain an understanding of how pioneers must have felt on their journey by taking a field trip."

The class was becoming excited about taking a field trip. Ms. Hennessey continued, "Some of you may have ancestors who traveled on the Oregon Trail and passed Chimney Rock. Your assignment is to gather information at the monument and from your family, if possible. We will build a display that records the importance of Chimney Rock."

As Miles walked home after school, he thought about the project assigned in history class. Miles wondered how events that happened long ago had a connection to his life, but he could not think of any ways.

Miles gave his dad the field trip permission form. Then handing it back to Miles, his dad said, "This will be an excellent way for you to experience history firsthand. It will be much more exciting than reading a book or using a computer."

"At least I'll have time on the bus to read my mystery book," Miles said.

After a short ride the next day, the bus arrived at the monument. Miles reluctantly set his mystery book aside and stepped off the bus. He was amazed by the unusual shape of the rock formation nearby. It looked like an upside-down funnel.

"Chimney Rock stands 470 feet high," recited a park ranger. "Pioneers traveling west could see it from miles away. The rock marked the end of the Great Plains and the beginning of rugged-mountain travel."

Miles followed his classmates through exhibits. He attempted to pack a wagon at the hands-on demonstration, but a red light blinked to announce that the wagon was overloaded. The afternoon included watching a film about the Oregon Trail and hiking to the track site. Each student placed a foot in the deep ruts made by wagon wheels long

ago.

Miles pretended to walk beside a covered wagon loaded with his family's belongings. He imagined how the pioneers felt—not knowing what waited beyond the next hill. He wondered what it was like to sleep on the ground and cook meals on a campfire. He thought about wild animals, perilous river crossings, sickness, and unpredictable weather. On the bus trip back to school, Miles could not focus on his book. He kept thinking about the information he learned that day. He wondered whether he had ancestors who had traveled exactly where he had stood today.

When Miles returned home from the trip, he was surprised to see his grandmother. She had arrived for a visit with the family. Miles told her about his field trip and asked her if she knew any information about Chimney Rock.

“When I was a little girl,” Grandma Lucy said, “I used to pretend I was a pioneer heading west on the Oregon Trail. My parents used to tell me stories about how my great-grandparents traveled west to follow dreams of a better life.”

“Grandma!” Miles interrupted, “are you saying I have relatives who traveled on the Oregon Trail?”

“That’s exactly what I’m telling you,” said Grandma.

“Did they have a covered wagon? Did they meet any Native Americans? Do you have a photograph I can use for my school project?” Miles asked excitedly.

“I can do better than that,” Grandma said with a smile. “I have my great-grandmother’s diary.” She opened her handbag and pulled out a slim, leather book with ragged edges. Grandma Lucy carefully lifted the cover. Miles spotted handwriting so old the ink was golden brown against the yellowed pages.

“As a girl, I read this book so many times, I had it memorized. It tells the story of a perilous trip,” Grandma said.

Miles could hardly wait to hear more. He finally realized how exciting history could be.