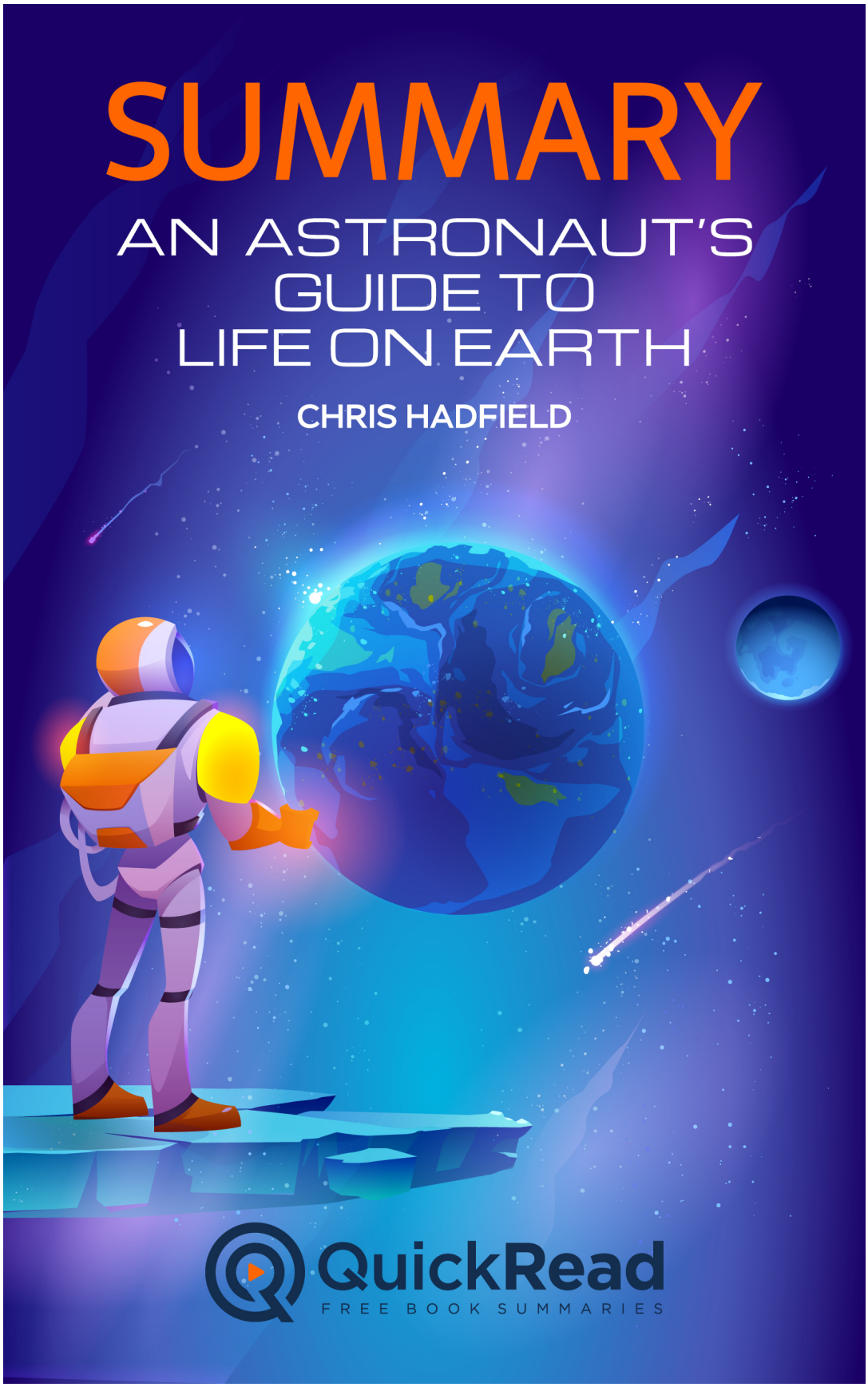
SUMMARY

AN ASTRONAUT'S GUIDE TO LIFE ON EARTH

CHRIS HADFIELD



QuickRead

FREE BOOK SUMMARIES

Summary of “An Astronaut’s Guide to Life on Earth” by Chris Hadfield

Written by Lea Schullery

What Going to Space Taught Me About Ingenuity, Determination, and Being Prepared For Anything

Introduction

On the evening of July 20, 1969 author Chris Hadfield was just nine-years-old when his life changed forever. Sitting on the back of the couch craning his neck to see the television screen, Chris witnessed history as Neil Armstrong became the first person to walk on the moon. The image was grainy, but Chris understood what he was seeing: the impossible, made possible. Somehow, Chris felt that he was right there with Neil Armstrong, changing the world with him. It was that night that Chris decided that he wanted to become an astronaut. He also knew that as a Canadian, becoming an astronaut might be near impossible. All astronauts were American and NASA only accepted applications from U.S. citizens. Still, Neil Armstrong had done the impossible by walking on the moon, surely Chris could do the same. He started his training the very next day, ensuring each decision he made would launch him into space one day. He asked himself, “Would an astronaut eat his vegetables or have potato chips instead? Sleep in late or get up early to read a book?” From that moment on, Chris spent his life training to become an astronaut. Even when his dream didn’t seem like it could be possible, Chis never quit. Throughout his journey to space, he also learned some critical lessons that he applied to his life on Earth. So if you want to learn what it takes to become an astronaut and what it’s like to orbit the Earth from space, then keep on reading.

Chris' Training Began At the Young Age of Nine

In the fall of 1969, Chris threw himself into his studies. He entered an enrichment program that taught him to think more critically and analytically, not just arrive at the right answers. He was taught how to learn. Additionally, his father made sure his kids learned from their mistakes. With five kids and living on a farm, there wasn't room for many mistakes; their livelihood depended on their work. So when Chris hooked the drawbar behind the tractor and broke the bar, his father told him sternly he better learn how to weld the bar back together and get back to work. His father helped him with the welding and Chris was back on the tractor in no time. Later that same day, he broke the bar again in the same way. Frustrated, he welded the bar back together again and headed out to the fields. The farm taught Chris patience, and his rural life also afforded him the time to read and study during long commutes to school - 2 hours each way.

At the age of 13, Chris joined the Air Cadets, a cross between Boy Scouts and the Air Force; he learned about military discipline and leadership and was taught how to fly. At the age of 15, he received his glider license, and at 16, he started learning how to fly powered planes. He was hooked. He fell in love with the sensation, the speed, and the challenge of trying to execute particularly difficult maneuvers. Then, after high school, Chris applied to military college. Back then, the route to NASA was via the military, so he majored in mechanical engineering thinking that if he couldn't become a military pilot, he could at least become an engineer and figure out how things work.

Six months before graduating from college, Chris married his high school sweetheart Helene. Then, as soon as he finished his training to fly fighters, he was stationed at Bagotville, Quebec where he would fly CF-18s for the North American Aerospace Defence Command (NORAD), and intercept Soviet aircraft that strayed into Canadian airspace. The next three years

were difficult, and while he loved flying fighters, he now had two children and one on the way. Could this work be sustainable for his family? It was dangerous and his team was losing at least one close friend every year. So he decided to go to test pilot school. He loved to fly, but he wanted even more to understand airplanes: why they do certain things and how to make them perform better.

Eventually, he was selected to attend the U.S. Air Force Test Pilot School (TPS) at Edward Air Force Base in Southern California. This was 1988 and it became one of the busiest years of his life. Test pilot school was tough but he was finally around people who loved flying and engineering just as much as him. It is also no secret that TPS was a direct pipeline to NASA. But would it allow him the opportunity to join the Canadian Space Agency (CSA)? He wasn't sure but he was committed to the dream. Eventually, Chris was selected to work at the Patuxent River Naval Air Station in Maryland, one of the few major test centers in the world. His time there proved to be critical in launching his career as an astronaut.

During his time in Maryland, Chris tested F-18s, trying different techniques to control airplanes without sending them ripping all over the place. Meanwhile, he began earning a master's degree in aviation systems at the University of Tennessee. He then piloted the first flight test of an external burning hydrogen propulsion engine, an engine that would make a plane fly far faster than the speed of sound. As if that wasn't enough, he and Sharon Houck, another flight test engineer, wrote about their research and won The Society of Experimental Test Pilots' top award. Essentially winning an Oscar in the world of test pilots. Then, in 1991, Chris was named the U.S. test pilot of the year. But it wasn't until later that year when his dream came to reality. The Canadian Space Agency took out an ad in the newspaper, "Wanted: Astronauts."

Applying For An Astronaut Position is a Long, Rigorous Process

Applying for the position of an astronaut is nothing like applying for an ordinary job. Chris had just 10 days to submit his resumé and he was set on making it the most impressive document anyone had ever seen. There were pages upon pages of everything he had ever done, every honor and award and course he could remember. He got it professionally printed on high-quality paper and even had it bound. But he didn't stop there. He had a friend translate the entire thing into perfect French, and had that version separately printed and bound. Finally, it was sent out and his application became one of 5,329.

A few weeks later, a letter arrived informing him he made it to the top 500 applicants. The next step was to fill out psychiatric evaluation forms. He did. The next few weeks he heard nothing. Fearing he was too psychologically unbalanced, he decided to call CSA and inquire about the status of his evaluation. The guy who answered said, "Hadfield. Here's Hadfield. Congratulations, you've made it to the next level." There were now only 100 left, and each one was asked to go to Washington D.C. for an interview with an industrial psychologist. When he arrived, he doesn't remember much other than meeting in the psychologist's hotel room and being asked whether he's ever wanted to kill his mother.

Another few weeks passed before Chris found out he had made it to the final 50. He was instructed to go to Toronto for more interviews. There, he underwent several medical tests to ensure he was healthy enough and then went through a lengthy panel interview with people from CSA, including Bob Thirsk, one of Canada's first astronauts. Chris traveled back to Maryland where he found out he made it to the final 20. The next step was to head to Ottawa in a few weeks to undergo even more tests. Chris knew his body would be put under the microscope, so he began exercising and eating carefully to ensure he was the picture of good health. He also figured

out the 100 things they might ask him, so he began practicing his answers. Then he practiced them in French.

The competition was fierce. The other 19 applicants were quite impressive. Some had Ph.D.s, some were military college graduates, and some had several publications to their names. There were doctors, scientists, and test pilots. Each day they were put to the test with mock press conferences, in-depth medical exams, and an hour-long panel interview with CSA bigwigs, PR people, and astronauts. After a particularly challenging question, he took a gamble by making a joke. The panel laughed uproariously as he took advantage of the time to form a decent answer. Afterward, he was told to wait for a phone call between 1:00 and 3:00 p.m. on a particular Saturday in May to see if he'd been selected or rejected.

That Saturday arrived and at 1:00 p.m., the phone rang. On the other end was Mac Evans asking Chris if he wanted to be an astronaut. He always had. His lifelong training and his hard work had finally paid off. In the end, only four astronauts were chosen and Chris felt as if he was finally reaching the summit of the mountain he'd been climbing since nine-years-old. Of course, he wasn't there quite yet. As Chris states, "Becoming an astronaut, someone who reliably makes good decisions when the consequences really matter, takes more than a phone call. It takes years of serious, sustained effort because you need to build a new knowledge base, develop your physical capabilities and dramatically expand your technical skillset. But the most important thing you need to change? Your mind. You need to learn to think like an astronaut." Chris was only getting started.

Preparation is Key in Space

Chris still remembers the first day he ever left the planet. He remembers thinking, “These are the socks I’ll be wearing in space.” It seemed surreal. As he and his crew prepared for take-off, they were hyperfocused, ensuring everything went smoothly for their survival. Suddenly, there were just six seconds to go. The engines started to light, and at that moment he felt an enormous, violent vibration. Christ stated, “It feels as though we’re being shaken in a huge dog’s jaws, then seized by its giant, unseen master and hurled strat up into the sky away from Earth. It feels like magic, like winning, like a dream.” In just 8 minutes and 42 seconds, Chris traveled through every layer of the atmosphere into space. In less than ten minutes Chris was no longer on planet Earth, but it took a few thousand days of training to get there.

People are often curious about what astronauts do when they *aren’t* flying in space. Are they just sitting at home waiting for their next mission? Of course not! These same people become disappointed when they hear that astronauts spend most of their life completing earthbound training. That’s because going up into space requires an incredible amount of skills. The ability to pilot a rocket, walk in space, and repair various instruments and pieces of the space station might seem like obvious skills, but astronauts also need to prepare for the less obvious tasks. While in space, astronauts find they are also surgeons, dentists, IT engineers, electricians, and more. They must prepare for every scenario, after all, a rescue crew certainly won’t be traveling through space to help them out or bring them home.

On a mission in 2013, Chris and his team saw “fireworks” or “fireflies” coming off the left side of the Station. Initially believing they sustained damage after being hit with a meteorite, they took some pictures and sent them back to Earth. After a few hours, they received word that the International Space Station (ISS) had an ammonia leak on the port side. Ammonia cools the Station’s huge batteries and power conversion systems, as well as the living quarters. In other words, this was a big deal. As the

hours went by, they received more bad news. The leak was increasing and the Station was losing its lifeblood. The next morning, they awoke to the news that they would be prepping for EVA day (extra-vehicular activity or spacewalk). EVAs are typically planned years in advance, maybe months for an “unplanned” walk. Chris and his team didn’t have time for the luxury to plan for months or years in advance. They only had one day.

The team decided EV1 and EV2 would be Tom and Chris (not the author Chris), they would be the ones completing the EVA. The first step was to work on their diets, they needed to consume more carbs so they would have enough energy if they ended up spacewalking. Then, they needed to recharge batteries for the spacesuits, gather the necessary tethers and equipment, pre-stage the airlock with all they needed, and re-size a spacesuit for Tom. And this was only the beginning of preparation. Meanwhile, Mission Control created the choreography for EV1 and EV2, determining the moves they would make and the tools they would need. Chris spent the day creating something that looked like an oversized dental mirror that could be used to inspect enclosed spaces for a leak. He simply used tape, zip ties, and an existing mirror.

The preparation didn’t end there. They had to prepare for everything that could go wrong. For instance, one possibility was ammonia contamination; therefore, they had to prepare to decontaminate Tom and Chris when they came back into Station. Since ammonia decontamination isn’t a common procedure, Chris had to complete a mini-simulation where he looked at all the hardware and worked through the whole matrix of possible scenarios. The next day, the team completed the 5 1/2 hour spacewalk. Chris recalls that during that time he felt like a choreographer watching dancers perform. Even better, the EVs came back uncontaminated and had fixed the problem. It was an overall success. They had beaten the odds, done the job, and perhaps even saved the station.

Making Mistakes is Unacceptable But Can Provide Life-Saving Lessons

As mentioned in the previous chapter, a major part of an astronaut's job is completing Earthbound training. Much of this training involves completing simulations to become 99% prepared for every mission. Making a mistake or screwing up can't even be in an astronaut's vocabulary. You can only screw up in a simulation, but even then, astronauts try to avoid making a mistake. After all, "No one wants to die in the simulator." Simulations are all about creating experiences that astronauts may never encounter but should be prepared for. These might include things like engine trouble, computer meltdowns, explosions, and fire.

Preparation is key for any mission in space, but Chris believes this training will be useful on Earth too. Life is anything but predictable so planning for life's obstacles is one of the best ways to tackle them. Chris calls this the *power of negative thinking*. Once you've prepared for anything that can go wrong, you'll have peace of mind knowing that you'll make the right decisions no matter what happens. For Chris, his training has transformed into an everyday mental discipline. For example, if he enters a crowded elevator, he thinks, "What are we going to do if we get stuck?"

Preparing for a mission comes with criticism as well. When you think about criticism, you probably think of people attacking you just to get you down. For astronauts, however, accepting criticism and giving constructive criticism is a crucial skill for survival. This simply means that astronauts must be able to point out mistakes in an objective manner, while also accepting their own without taking it personally. Learning from other people's errors and accepting criticism is a matter of life and death. This often means sharing mistakes openly in an environment where errors are unacceptable.

As a result of this criticism, a list of Flight Rules is created that outlines the steps to take when problems do arise. Flight Rules prepare astronauts to

face problems with confidence and protect them from taking dangerous gambles that could have catastrophic consequences. After all, when you're in space, you only have each other to rely on for survival. You can take this lesson to Earth and use it in your everyday life as well. In other words, it's important to create an environment that encourages people to learn from their mistakes. Teams should learn from past failures and avoid blaming a single person; you should rely on one another for the survival of your business, company, family, or relationship.

Life In Space and Prioritizing Time With Your Loved Ones

Being an astronaut is certainly exciting and allows people like Chris to do something only a few dozen people have ever done. But choosing the life of an astronaut also means giving up spending time with your family. For instance, one of Chris's missions included spending 144 days on the ISS, the International Space Station. But before we discuss the difficulties of being away from family, let's talk about something you're all very interested in: life in space. What exactly is it like to live on the ISS for months at a time?

Well, similar to that of a boat, everything you need is on board the rocket ship. There's no running water, considering the lack of gravity would simply make the water form into blobs and float around, ruining the equipment on the ship. No running water also means there are no long, hot showers. Instead, astronauts wash their hair by scrubbing their scalps with a non-rinse shampoo. Then, they have to dry it very carefully to prevent stray hairs from floating all over the spacecraft. Additionally, astronauts must exercise for two hours a day. Exercise is an essential part of their routine as muscles and bones will waste away if they are not used. Moving through the ISS requires so little energy, astronauts must use specialized equipment for exercise training.

Of course, living on the ISS is more than just weightlessly floating around and exercising. Their missions also involve researching more about space and how to explore areas not yet discovered while staying alive. But much of their research helps life here on Earth too. For example, experiments and research conducted in space have influenced the fields of medicine and robotics. Furthermore, much of the data gathered on the ISS helps power something you likely use every day: Google Maps. Spending all that time in space, however, means that astronauts must complete months, and even years, of training that doesn't occur at home.

For instance, from 2007 onward, Chris spent six months of the year training in Moscow. Chris has completed training all over the world in places like the United States, Japan, Germany, Canada, and Kazakhstan. For many years, Chris only spent about 15 weeks at home, which meant he missed many birthdays, holidays, and major life events. As a result of missing out on so much family time, Chris details the importance of making up for time lost with your loved ones.

Because his wife Helene supported his dream of being an astronaut, she supported his career wholeheartedly despite the sacrifices Chris had to make. One year, the couple sat down to plan the times in which Chris would be away. He realized that he would be gone for Valentine's Day, so he knew he had to do something special for his wife. That year, he arranged a gift and a card in advance to be delivered on that day. Additionally, he realized that the launch of his ship was happening on his son's 16th birthday. He didn't want his mission to overshadow his son's milestone birthday, so during interviews, Chris announced that his crew would be lighting the biggest candles, the rocket's engines, to celebrate his son's birthday.

Astronauts aren't the only people who have stressful, demanding jobs that require them to be away from their families. Even those who don't spend time away might not appreciate the time they do get together. Therefore, Chris believes it's important to prioritize family no matter what your career is. Find ways to make up for the time lost with them, and as a result, you'll feel more connected as a family. Even when you do go away, they'll be reminded of your love and understand that you can't always be there.

Returning to Earth and Readapting to Gravity

As you've learned so far, launching off into space takes years of preparation and training. When the time finally comes, take-off is an exciting event, gathering thousands of spectators and media who broadcast the rocketship taking off into space. The spaceship rumples, flames erupt, and in less than ten minutes, the crew is up in space. But how do they return? Well, let's just say it's not as *smooth* as taking off - if you can call being jolted around violently smooth.

Today, most space shuttles land on the Russian Soyuz spacecraft since the American Space Shuttle stopped its service in 2011. Unfortunately, Soyuz landings are also notorious for being rough. Re-entry into the atmosphere takes approximately one hour and nearly every astronaut has an incredible story involving a rough landing. For example, astronaut Yuri Malenchenko detailed the events of his 2008 landing on the Soyuz. During the landing, the parachute designed to decelerate the re-entry capsule caught fire and completely burned up. Luckily, the crew survived despite landing far away from their intended target. As a result, no one was around to rescue them; eventually, many locals followed the smoke asking the astronauts where their "boat" came from!

Surviving the landing is only the beginning. After being in space, the body must readjust to gravity. They say it takes a day on Earth to recover from each day in space. When floating in space, your body is completely weightless, so when you return to Earth, your body feels as if it has aged. Simple things like sitting in a chair and feeling your weight can become uncomfortable and painful. While it may take a long time to adjust, returning to Earth has become a transformative experience for many astronauts, and they often find a new appreciation for life on Earth. For Chris, he realized that space is both fascinating and lethal to life. This realization helped him develop a new perspective and helped him apply the crucial lessons he's learned as an astronaut to his everyday life on Earth.

Final Summary

Growing up, many children dreamed of going to space and becoming astronauts, and Chris Hadfield was no different. At just nine-years-old, he became determined to turn that dream into a reality. Training for Chris began the morning after he witnessed Neil Armstrong walk on the moon, and every decision he made from that day forward was aimed at helping launch him into space someday. His years of preparation worked out. Becoming an astronaut is no easy feat. It takes years of preparation, continuous criticism, and even time away from your family. Even more, your body goes through physical stress and much medical testing to ensure your body is healthy enough for space. Once you're in space, you only have yourself and your crewmates to rely on for survival. Despite the difficulties and hardships, being an astronaut is both fulfilling and rewarding, allowing people like Chris to gain a better appreciation for life on Earth.