DOWNLOAD PDF ASTRONAUT, LIVING IN SPACE

Chapter 1 : 20 Facts About Astronauts And Living In Space | Obsev

Living in space is not the same as living on Earth. In space, astronauts' bodies change. On Earth, our lower body and legs carry our weight. This helps keep our bones and muscles strong.

Space Exploration Living Out In Space Have you ever wondered what life would be like for an astronaut living out in space? Astronauts have to get special training to learn how to live in space. And everything else in the spacecraft would be weightless too! Instead, they float along and pull themselves with their hands or push off the walls with their feet! Astronaut Stephanie Wilson floats on the space shuttle Discovery. This is why astronauts have a really hard time standing and walking when they get back from space! Astronauts from the ISS have to be carried away from the landing site! Or that any of your astronaut friends brought with them. A week before they go into space, they are put in quarantine. The astronauts in this photo are behind the glass wall. Certain types of radiation can damage living organisms. Since the ISS is outside the atmosphere, they get exposed to ten times more radiation than we do here on Earth. The ISS orbits the Earth 16 times a day, so astronauts there see 16 sunrises and sunsets each day! ISS astronauts get to see lots of sunsets like this! NASA You can probably imagine that this makes it hard for astronauts to keep track of when they should be asleep. Normally, our bodies are pretty good at reminding us that we should be asleep at night and awake during the day. To help them stay asleep, astronauts often sleep with eye covers and earplugs. These two astronauts are sleeping peacefully on the ISS. Astronauts on the ISS stay there for a few months or up to a year. The whole station is big, but the parts that the astronauts can stay in are long and narrow. Some astronauts get claustrophobic on the space station. This is one of the bedrooms on the ISS! NASA Astronauts often also get homesick. Because of these challenges, astronauts have to take extra care to stay mentally and socially healthy. Many astronauts take pictures of friends and family with them to space. They also have a phone so they can call home whenever they want!

Chapter 2 : NASA - Living in Space

Life in space also means living with a distinct lack of space. The ISS is vastly larger than any previous space structure, but even so it is no mansion. Astronauts can enjoy the finest views imaginable, with the whole planet stretched out before them amid the starry immensity of the universe.

Living in space Yuri Gagarin on his way to the launch pad Like every other living creature we know of, humans evolved at the bottom of a gravity well. What is surprising is that humans turn out to adapt remarkably well to zero-g more precisely, microgravity. Since then, scientists around the world have had the benefit of years of data on the effects of long-term space living. The record for a long-duration mission is still held by Russian cosmonaut Valeri Polyakov, who completed a day tour of duty aboard the Mir space station in The crews of the ISS are already making full use of that experience, and will certainly add to it. Weightlessness itself is the most important and the most obvious influence on life in space. Most astronauts find their freedom from gravity exhilarating, especially as they adapt to their new environment. But weightlessness enormously complicates the business of daily life, from eating to sleeping. And space adaptation involves some very complex changes in the human body, both short-term and long-term. These changes can cause health problems both in space and on return to Earth. There are other factors, too. Mostly, these have minor and long-term effects: But during occasional solar flares, the sleet of radiation from the Sun can be immediately life-threatening. Human psychology plays an important part in the story, too. Life in space also means living with a distinct lack of space. The ISS is vastly larger than any previous space structure, but even so it is no mansion. Astronauts can enjoy the finest views imaginable, with the whole planet stretched out before them amid the starry immensity of the universe. But their living quarters are pretty cramped, and they must share them with their fellow crew members for months at a time. Still, there is no shortage of applicants for astronaut positions. And virtually everyone who has had the chance to live in space is keen to return. Besides, as our knowledge increases, and space medicine develops throughout the 21st century, the men and women in orbit - and hopefully beyond - should have a more comfortable time in future. Fortunately, the effects are seldom more than temporarily disabling: And when astronauts return to Earth, they normally re-adapt very quickly to the customary, gravity-bound environment. The vestibulary system and "Space Adaptation Syndrome" We take our ability to stand upright just as much for granted as we do the force of gravity that holds us to the Earth. In fact, the human sense of balance depends on an extremely sophisticated sensor system that provides a constant stream of information to the brain. The key motion sensors are the subtle organs of the vestibulary system inside the inner ear. These function as super-sensitive accelerometers feeding the brain with a steady stream of signals that indicate motion and direction. There are also pressure receptors in the skin and in muscles and joints. Our senses of sight and hearing complete the data stream. In the absence of gravity, signals from the vestibulary system and the pressure receptors are wildly misleading. The effect usually leads to immediate disorientation: This disorientation is the main cause of the so-called Space Adaptation Syndrome, which one astronaut wryly described as "a fancy term for throwing up". Half or more of all space travellers suffer from space sickness, which brings with it headaches and poor concentration as well as nausea and vomiting. Usually, though, the problems disappear within a few days as astronauts adapt. It is their brains, not their stomachs, that do most of the adapting. The confusing signals from the inner ear are largely ignored and vision becomes the prime source of "balance" information. In space, "down" is where your feet happen to be. When they return to Earth, astronauts have to re-adapt just as painfully. Back at the bottom of the gravity well, most have difficulty maintaining balance - and if they close their eyes, they are very likely to fall over. Because of the effects of weightlessness on bones and muscles, they may have difficulty standing at all. But disorientation itself usually only lasts a few days, and there seem to be no long-term effects. There is one re-adaptation that can take somewhat longer to accomplish, although the consequences are more likely to be amusing than crippling. Several long-duration Russian cosmonauts have reported that months after their flight, they still occasionally let go of a cup or some other object in mid-air - and are quite disconcerted when it crashes to the floor. Heart, circulation and body fluids The human heart Almost two-thirds of the average body

weight is made up of water, in the form of intercellular fluid, blood plasma and the interstitial fluid between blood vessels and surrounding tissue. On Earth, all this liquid tends to settle downward in the body. Blood pressure at our feet, for example, is about mm of mercury higher than blood pressure in our chests. And the need to pump blood against the force of gravity requires the muscles of a big, powerful heart. In space, there is nothing to pull body fluids down: The first effects are almost immediate. Without the restraint of gravity, fluids migrate from the legs to the head. Inside a day, legs shrink by up to a litre in volume and faces puff up correspondingly. The extra fluid in the head also leads to blocked sinuses and noses - the "space sniffles" that astronauts generally have to live with throughout their mission. Other effects are more serious. Without gravity to contend with, the heart has to do far less pumping work. Since the body no longer needs to maintain the powerful heart muscles needed on Earth, heart tissue begins to shrink. Exercise is not enough to reverse the process, but it helps to minimise it and the exertion also provides some relief from the "sniffles". Whenever possible, astronauts spend several hours a day on a treadmill or similar apparatus: Bones and muscle Astronaut Umberto Guidoni Bones are the scaffolding that holds the body against gravity. Our powerful skeletal muscles support that scaffolding - and of course move it around as required. Without gravity, bone and muscle alike lost their prime function. After even a short time in orbit, some strange things begin to happen. The first seems like good news: Unfortunately, the extra height can bring complications, which may include backache and nerve problems. More worrying than height gain, though, is the loss of bone and muscle tissue that becomes apparent from the first few days of a space mission. Bone is a living, dynamic tissue. In normal life, new bone cells are constantly being made while worn bone is destroyed and its materials recycled. Bone regeneration is governed by a complex system, regulated by hormones and vitamins as well as physical stress on various parts of the skeleton. In microgravity, the body has no need to maintain its skeletal structure to Earth-bound standards. So bone tissue is absorbed and not replaced: The missing bone shows up as high calcium levels elsewhere in the body, which itself can lead to health problems - kidney stones, for example. Microgravity bone loss stops soon after astronauts return to Earth, but so far, no one is sure whether the lost bone fully regenerates. The life science experiments planned for the ISS should help scientists learn much more precisely how bone loss comes about, and perhaps how to cure it. Since the problem is very similar to osteoporosis, a bone-wasting disease especially common among elderly women on Earth, astronauts will not be the only people to benefit from the research. It may also be essential to a mission: Psychology The human brain Most astronauts, at least once they get over any space sickness, report an initial exhilaration at their freedom from weight. They are all disciplined, highly trained people, too, who share a sense of being part of an elite team with important work ahead of them. So it is not surprising that psychological problems are unusual on short-duration space missions. Sooner or later, though, despite the marvellous views and the sense of mission, astronauts do feel the pressure of confinement in what amounts to a few small rooms. One Russian cosmonaut wryly remarked, "All the conditions necessary for murder are met if you shut two men in a cabin measuring 5 metres by 6 and leave them together for two months. But Russian psychologists - with almost 90, flying hours aboard the old Mir station to provide their data - have learned a good deal about the psychology of long-term space flight. Generally, they observed their cosmonauts go through three distinct phases. During the first, which usually lasted about two months, people were busy adapting, usually successfully, to their new environment. In the second phase, their were clear signs of fatigue and low motivation. And in the final phase, cosmonauts could become hypersensitive, nervous and irritable - a group of symptoms the Russians called "asthenia". Other than a return to Earth, there seems to be no instant cure. But an easier workload, coupled with frequent opportunities for private communication with families back home, are important morale boosters. ISS operations managers have learned a great deal from the Russian experience, which is one reason why duty tours aboard the station will normally be limited to six months.

Chapter 3 : Astronauts: Living in Space (TV Movie) - IMDb

*Astronaut Living in Space on racedaydvl.com *FREE* shipping on qualifying offers. Describes the various steps necessary for an astronaut to prepare for a flight into space and follows astronaut Linda Gardner as she trains for her space shuttle mission.*

Many things are different. Our bodies change in space. The way we stay clean and neat is different too. Learn how astronauts stay strong, clean and neat. Staying Strong Image above: An astronaut walks on a treadmill to stay strong and healthy Living in space is not the same as living on Earth. On Earth, our lower body and legs carry our weight. This helps keep our bones and muscles strong. In space, astronauts float. They do not use their legs much. Their lower backs begin to lose strength. Their leg muscles do too. The bones begin to get weak and thin. So, how do astronauts help their muscles and bones? They must exercise in space every day. The heart and blood change in space, too. When we stand up on Earth, blood goes to our legs. The heart has to work extra hard against gravity to move the blood all around the body. In space, without the pull of gravity, the blood moves to the upper body and head. Water in the body also does the same thing. The blood and water are fluids in the body. These fluids move from the bottom of the body to the top. The brain thinks that there are too many fluids. It will tell the body to make less. When the astronauts come back to Earth, they do not have enough fluids in their systems. It takes their bodies a few days to make more blood and water. The astronauts have to rest so their bodies have time to make new blood and water. They might even faint! Staying Clean Image above: An astronaut brushes his teeth while in space On Earth, people need to stay clean. In space, astronauts need to stay clean, too. Staying clean takes more work in space. In space, the astronauts do not have a bathroom as we have at home. But, they do have their own toothbrushes, toothpaste, combs, brushes, and shavers. These are kept in a Personal Hygiene Kit. Astronauts use toothpaste and toothbrushes just like yours. There is no sink like yours on the Space Shuttle, though. Astronauts have to spit into a washcloth. People take baths a different way in space, too. Astronauts use special kinds of soap and shampoo. These soaps do not need water to rinse. Astronauts must use them carefully. They do not let the soap bubbles go all over the place. After washing, they use a towel to dry off. They do not rinse. These special soaps and shampoos were made for hospitals. Patients who cannot get in the water use these soaps. Staying Neat Doing chores is not always a fun thing. But we have to keep our rooms and houses clean and neat. In space, astronauts live in a very small space. They have to keep their area clean in space just like we do on Earth. In space, the astronauts wipe the walls, floors, and windows to keep them clean. They use a soap that kills germs. The astronauts also use wet wipes to wash things. They use the same kind of wipes and cleanser on their forks, spoons, and eating trays. Astronauts have to take out the garbage, too. There are four trash bins on the Space Shuttle. Three are for dry trash and one is for wet trash. Wet trash is anything that could smell bad. Each trash container has a trash liner placed inside. It is like a plastic garbage bag. If the liner becomes full, it is closed. Then it is moved far away from the astronauts. The wet trash is closed up tight. It is then connected to a hose. The hose helps move bad smells away from the astronauts. Astronauts must use a vacuum cleaner in space. The vacuum has a normal hose. It also has extra parts. These parts can clean areas that may be hard to reach. They also use it to keep dust out of the air filters. And sometimes things get loose. When things get loose, they float. Astronauts use the vacuum to "catch" floating objects that are out of their reach.

Chapter 4 : Astronaut by Kate Hayden | Scholastic

John Grunsfeld was an astronaut on the Space Shuttle Endeavor and he experience a worst-case scenario. The space shuttle's engine died and John Grunsfeld needed to figure out a way to start it again.

Just like on Earth, a worker in space goes to bed at night then wakes up the next day and prepares for work all over again. There are a few differences, though. In space there is no up or down and there is no gravity. As a result, astronauts are weightless and can sleep in any orientation. Click an image to see how astronauts sleep. Space shuttle and space station crews usually sleep in sleeping bags. There are only four bunk beds in the space shuttle. So that means on missions with five or more astronauts, the other crewmembers have to sleep in a sleeping bag attached to their seats or to a wall. On the space station there are two small crew cabins. Each one is just big enough for one person. Inside both crew cabins is a sleeping bag and a large window to look out in space. Currently, space station crews have three astronauts living and working in space for months at a time. Where does the third astronaut sleep? This is on the opposite side of the station from the Service Module where her crewmates slept. The length of the International Space Station during that mission was 52 meters feet long. Generally, astronauts are scheduled for eight hours of sleep at the end of each mission day. Like on Earth, though, they may wake up in the middle of their sleep period to use the toilet, or stay up late and look out the window. During their sleep period, astronauts have reported having dreams and nightmares. Some have even reported snoring in space! Sleeping in close quarters can also be disruptive since crewmembers can easily hear each other. The sunlight and warmth entering the cockpit window is enough to disturb a sleeper who is not wearing a sleep mask. When it is time to wake up, the Mission Control Center in Houston, Texas, sends wake up music to the crew. Usually, Mission Control will pick a song for a different astronaut each day. Sometimes a family member will request a favorite song for their particular loved one. Depending on the astronaut, Mission Control will play all types of music such as rock and roll, country and western, classical, or Russian music. However, only a shuttle crew receives wake up music while a space station crew uses an alarm clock. Listen to some wake up calls

Chapter 5 : HSF > Living In Space > SPACE SLEEP

This explains each interior pressurized module, crew living quarters, and scientific equipment.

Share Shares Living in space is the ultimate science fiction dream. During their missions, astronauts have to adjust to a very very different way of life. Mold, microbes, bacteria, and fungi are a serious problem in space. Sufficiently large growths can damage delicate equipment and cause health hazards, and no matter how well the shuttles are disinfected before they leave the atmosphere, these little critters always find a way to tag along. Once in space, the microbes stop acting like ordinary mold and become something straight out of a video game. They develop in moisture, which eventually condenses into hidden free-floating globules of microbe-infested water. These floating water concentrations can be the size of a basketball, and they are so full of dangerous microbes they can even degrade stainless steel. This makes them a terrible danger for the crew and the space station itself, if proper safety measures are not enforced. It is experienced by up to 80 percent of all space-goers. Since the body does not weigh anything in microgravity, the brain gets confused. Our spatial orientation the way our eyes and brain can tell where everything is usually relies on gravity. The brain deals with this by making the person terribly sick , in a manner not unlike motion sickness which is why the condition is also known as Space Motion Sickness. Symptoms can include everything from nausea and mild discomfort to uncontrollable vomiting and hallucinations. Senator Jake Garn, a former astronaut, holds the record for the worst case of Space Adaptation Syndrome in history. Luckily, most people will never get above 0. The sleeper must strap himself to a bunk in order to avoid floating around and bumping into things. A space shuttle has only four bunks, so in missions with more people, some astronauts must use a sleeping bag strapped to a wall , or even just a chair. Once they reach a space station, things get slightly more comfortable: Living in space at least the tiny part that humans have visited can also cause massive disruptions in sleeping patterns. Another, equally large problem is that the insides of space shuttles and stations are actually full of sound. Filters, fans and engines constantly whirr and buzz all around you. Until the astronauts get used to the noise, even earplugs and sleeping pills are sometimes not enough to cancel it. On the positive side, the quality of sleep you get in space may be a lot better than on Earth. Sleeping in a weightless state has been found to reduce sleep apnea and snoring , which leads to a much more peaceful slumber. Showers are obviously not an option in a weightless environment. Even if you had enough water on board, the water from the showerhead would just stick to your body or float around in tiny globules. The astronauts wash their hair with a special rinse-free shampoo, originally developed for immobile hospital patients. They wash their bodies with sponges. Only shaving and teeth-brushing are performed in the same way as they are on Earth. If even one loose hair escapes, it could drift into the eye of a fellow astronaut or even worse, clog an important part of machinery and cause some serious danger. The first space toilets operated with a simple air mechanism: There was also a special vacuum tube for urination. One of the most important systems of the toilet was the air filtering system. The air that carried the excrement was the same air needed to breathe, so a malfunction in the filters could make the cabin a very uncomfortable place. Over time, the designs got more diverse. Rotating fans, storage methods, and waste management systems were added and improved upon. These days, some space toilets are so sophisticated that they can even recycle the urine back into potable water. Want a fun fact to embarrass your astronaut friend? The astronaut has to sit on it properly. The average space suit weighs about pounds in normal gravity and requires 45 minutes to get into. It is so cumbersome that astronauts must use the special Lower Torso Assembly Donning Handles to put the lower part of the suit on. However, there are many other things about space-wear that are worth attention. Life in space requires a much smaller wardrobe than on Earth. After all, how would a person get dirty? You also sweat a lot less, as there is very little physical strain in zero gravity. Space crews usually change clothes every three days. The original plan was to install toilet facilities directly into space suits. On Earth, we constantly use our muscles: In space, the lack of muscular activity in a weightless environment soon leads to muscular atrophy the muscles begin to get smaller and weaker. To combat this degeneration and maintain their muscle mass, a space dweller needs to exercise an awful lot. Flatulence has a lot more in it than just a bad smell. It produces significant amounts of methane and

hydrogen, both of which are flammable gases. The food that early astronauts were fed was found to cause serious gas. Their rampant flatulence was thought to be a very real explosion risk, so some poor scientists had to analyze their gases in order to create a less gaseous diet. These days, flatulence is not treated as a massive, life-threatening risk. No one likes the guy who passes wind in an elevator for months on end. But living in space can still be dangerous to the brain. In fact, space itself can cause serious problems to people who live there for an extended amount of time. The problem is cosmic radiation: The longer a person spends in space, the more his or her brain is affected by the radiation. So when humanity eventually sets out to conquer Mars and other planets, the trip might well cause irreparable damage to our brains. This can add up to 5. The internal organs shift upward inside the torso, which decreases the waist measurement by several inches. Once gravity is removed, the powerful leg muscles that push the blood up against gravity start forcing blood and fluids in the upper body. This new, even fluid distribution buffs up the torso considerably, while making the leg girth considerably smaller. Even the facial features turn cartoonish, as the blood flow in the upper body will give the person a puffy, swollen face. All of this may sound disturbing, but it is actually fairly harmless. Pauli Poisuo also writes for Cracked. You can follow him on Twitter or contact him here.

Chapter 6 : NASA Astronauts Living In Space Can Still Vote - Here's How

Virtual Astronaut: An interactive, 3-D suite of instructional materials that demonstrate the activities of astronauts on board the International Space Station, including NASA's scientific research.

Chapter 7 : What does living in space do to your body

The Life in Space section of ESA's Kids site features news, quizzes, animations and games about astronauts, space stations, space exploration, living in space and alien life.

Chapter 8 : List of astronauts by name - Wikipedia

Living in space is the ultimate science fiction dream. It's also a dream that many brave men and women have been able to realize, thanks to the many shuttle and space station missions of various space agencies.

Chapter 9 : 20 Things You Didn't Know About Living In Space | racedaydvl.com

Astronaut Videos. Check out these cool videos which help show you what life is like for astronauts living in space. Learn where they sleep, what they eat, how they brush their teeth, what happens when they get sick and much more.