

Full
STEAM
ahead



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A collaborative educational story written by the participants of the project " Full STEAM ahead" from:

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MARS poem

*Mars is Earth's neighbour
The planet often called The Red.
There is no life there
And all the plants are dead.
Phobos and Deimos are the two moons of Mars
And around them, there are lot of stars.
Astronauts, the people who travel into space,
Come from ISS , a very important place.
On the Mars they have fun,
They drive the Mars Rovers,
Which replace all the cars.*

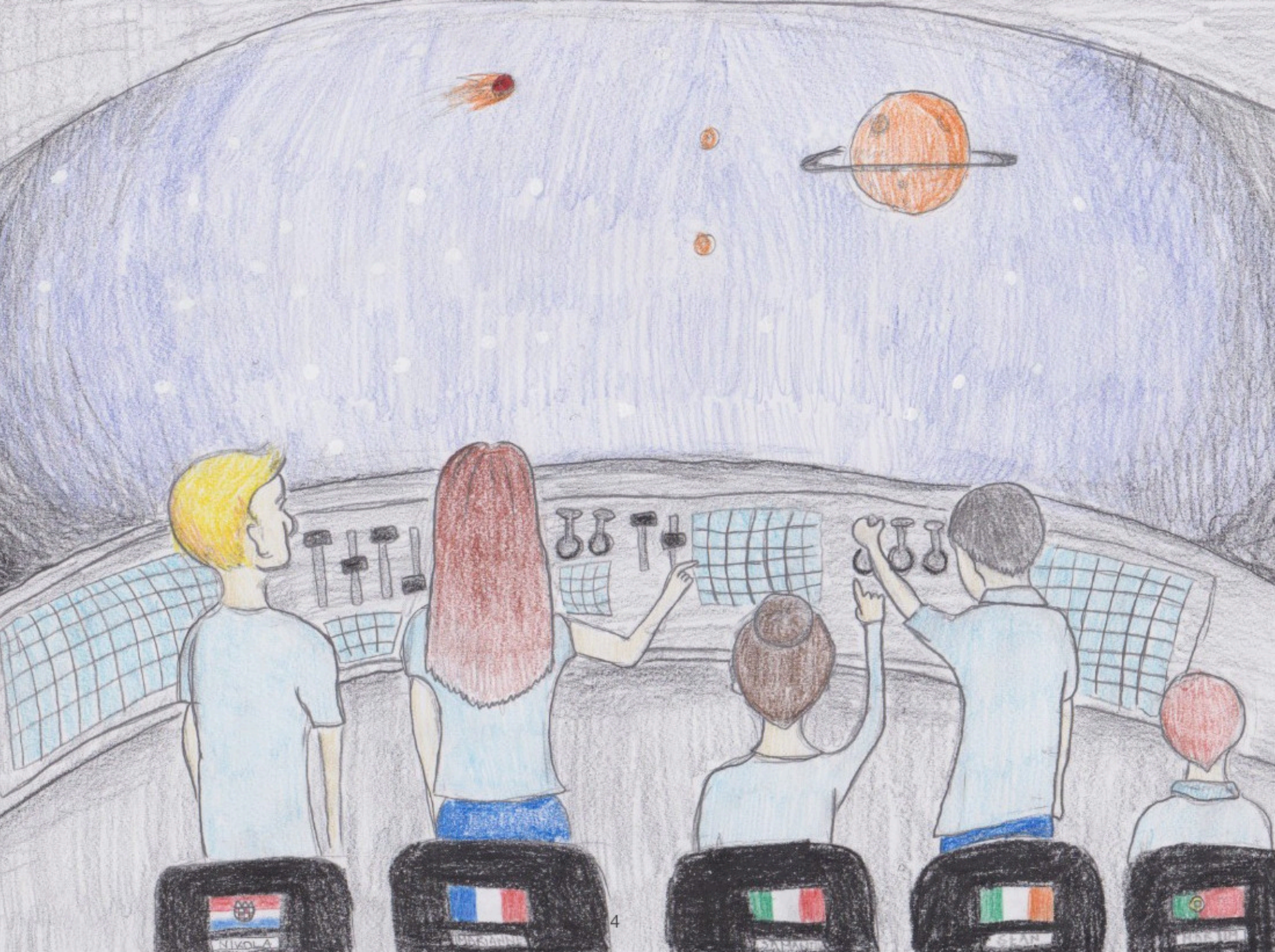
THE PREPARATION

At the International Space Station, everyone is working: space engineers are testing new circuits, technicians are developing new communication systems; in the research lab, scientists are conducting robotics and technology experiments.

One group of astronauts, being busy programming new engineering applications, is unexpectedly summoned by the captain.

“I have an important communication for you guys! You have been selected for the next mission on Mars! Samantha, Martim, Seán, Marianne and Nikola: a huge challenge is awaiting for you! Ready?”

A dream was about to come true for our five friends!



Their diversified training programme starts. A variety of simulators and facilities will help them prepare for their work in space.

The formidable Fives work hard and, once the first phase has been completed, they are ready for the next one! It's time to focus on activities, exercises and experiments, and to familiarize with the many power tools and special devices: a variety of simulators and facilities will help them for their work in space.

Deep within the pool, astronauts train for spacewalk: it will help them see what it's like to work in microgravity.

With their long days of training finally complete, the five astronauts enter the space capsule 2.5 hours before lift-off.

They work in collaboration with ground controllers to prepare the rocket for its final launch sequence. Have a good trip!!

THE JOURNEY

As the friends wait in the space ship, there is a great vibe of excitement, happiness and joy. It has been the five friends' life long dream to travel to Mars and, finally, it is about to become a reality. Samantha, Martim, Sean, Marianne and Nikola are wearing their spacesuits and thinking of endless possibilities as to what they will discover on their adventure to Mars. "Only one hour to take-off" Sean shouts excitedly.

They take a group selfie and await the countdown.

It will be a very long journey - 260 days to be precise.

Suddenly, there is a loud noise followed by the countdown. "10 9 8 7 6 5 4 3 2 1....

Lift-off!.

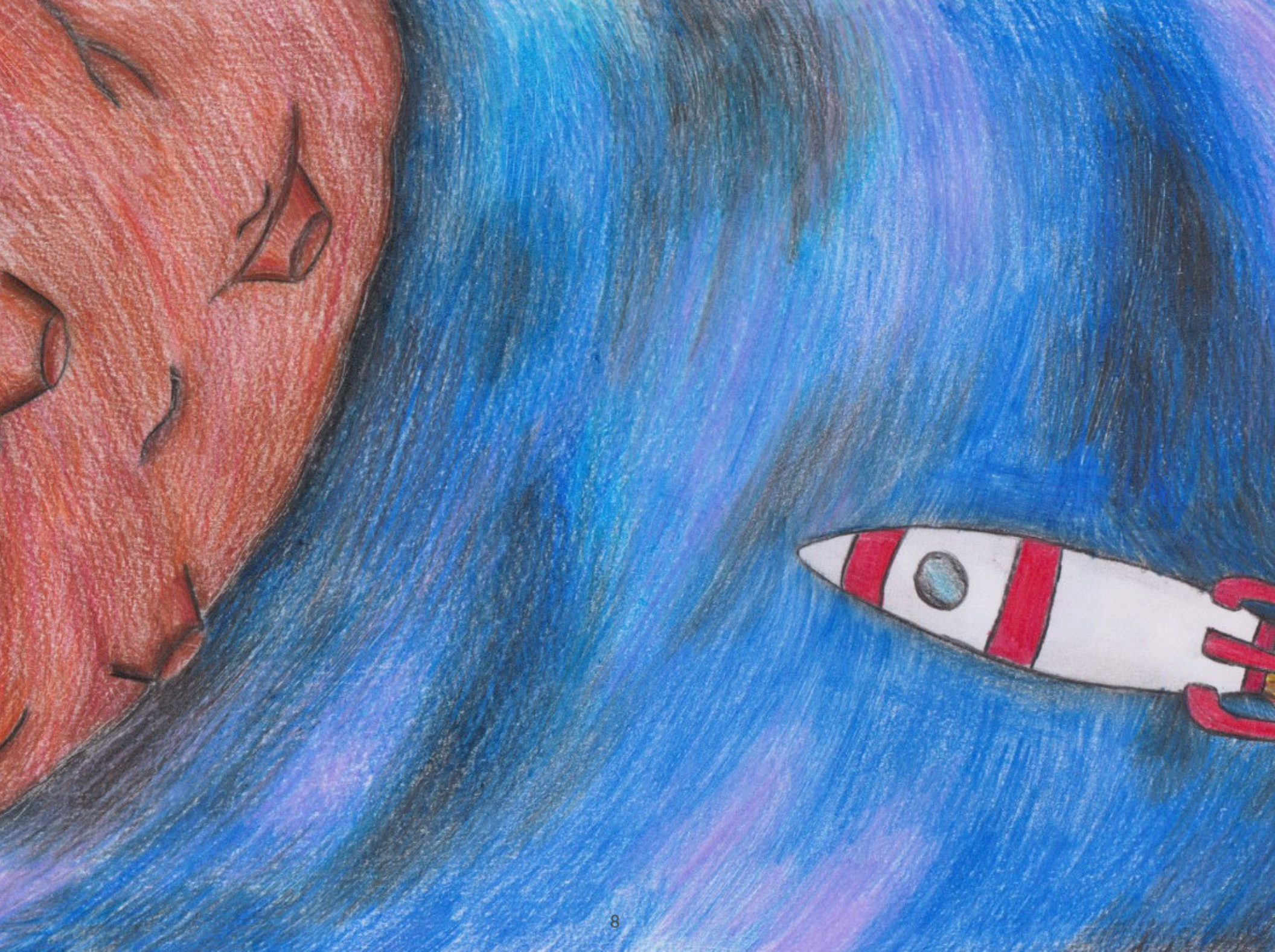
They pick up more and more speed, soon travelling at 29,000km per hour.

Martim contacts ESA HQ to inform them that they had safely reached space. They can now concentrate on the journey to Mars which will take approximately seven months.

They have enough freeze-dried food on board to last the journey. They prepare the food by putting water into the packaging and eating it once it absorbs the water. They use hot water to make hot meals. The food tastes different, keeping clean, neat and strong is difficult and different also.

They exercise for about two hours daily to prevent muscle or bone loss. They use different gym equipment than we use on Earth.

Planet Earth appears to get smaller and smaller as they travel.



Finally, after 259 days they are fast approaching Mars. They can see it up close at last. There it is! The Red planet!

THE LANDING

"Ha! We are landing soon! " exclaims Samantha.

"Indeed! It's been eight and a half months that we have been travelling", adds Nikola.

"I'm getting hungry, I will bring food." announces Seán.

The young astronaut heads to the reserve of food and finds that some food is missing, so he returns to the cockpit furious.

"Who ate some of our reserves? " shouts Seán. No one answers.

Seán unleashes his anger on his comrades. Meanwhile, Nikola, who does not want to meddle in this dispute, decides to do a thermal scan to get an answer. He discovers that there is a presence in the engine room. Taking his courage in both hands he head off to the engine room alone.

On arriving there he finds a young girl and quickly races back to tell his friends. The five astronauts rush to the engine room and they discover the sleeping body of the unknown girl. At first they hesitate to wake her up but before long she awakes and utters a cry of fear when she spots the astronauts who jump with fright.



"Who are you?" asks Marianne . "Err..my name is Aina. I'm a technician. " she stutters.

"What are you doing here?" asks Samantha.

"I was making the final checks when I hit a machine and woke up with you in space, " Aina explains.

" But why didn't you come to us earlier?" Marianne enquires.

" Because of the door of the cockpit that needs a code for entry and also because I was afraid of your reaction" Aina replies.

" Without knowing it, you're putting us all in danger, replies Seán, quite upset.

"True, we had planned food for 5 people, not 6, Nikola adds.

" Yes, but the most important thing is that in a few minutes we'll start landing and all our calculations will not work if she is here." replies Samantha.

“I'm sorry” whimpers Aina.

Suddenly, the rocket speeds up more and more and they all start running towards the cockpit.

“ We're going to crash!” Seán exclaims.

“ We are going way too fast!” Nikola shouts with panic in his voice.

Each man takes their place in the cockpit. When Aina asks them one by one to leave they all refuse. However, she doesn't give up and pushes Seán from his chair before taking the controls and managing to slow down the speed of the rocket. The rocket is damaged a little but finally the team manage to land safely.



FIRST PROBLEMS

“Are you all okay?” Seán asks.

“I think we might have some injuries, but we will be fine.” Nikola answers with an annoyed voice. “You shouldn’t have done that, Aina!” he roars. “You have endangered the aircraft and its occupants, you should not have changed the landing procedure the way you did. After settling down, we’ll gather and decide how to punish you. Meanwhile, try to use your knowledge to check for any malfunctions.”

Following Nikola's outburst, the five astronauts make their way to the landing ship door, but they stop suddenly before opening it.

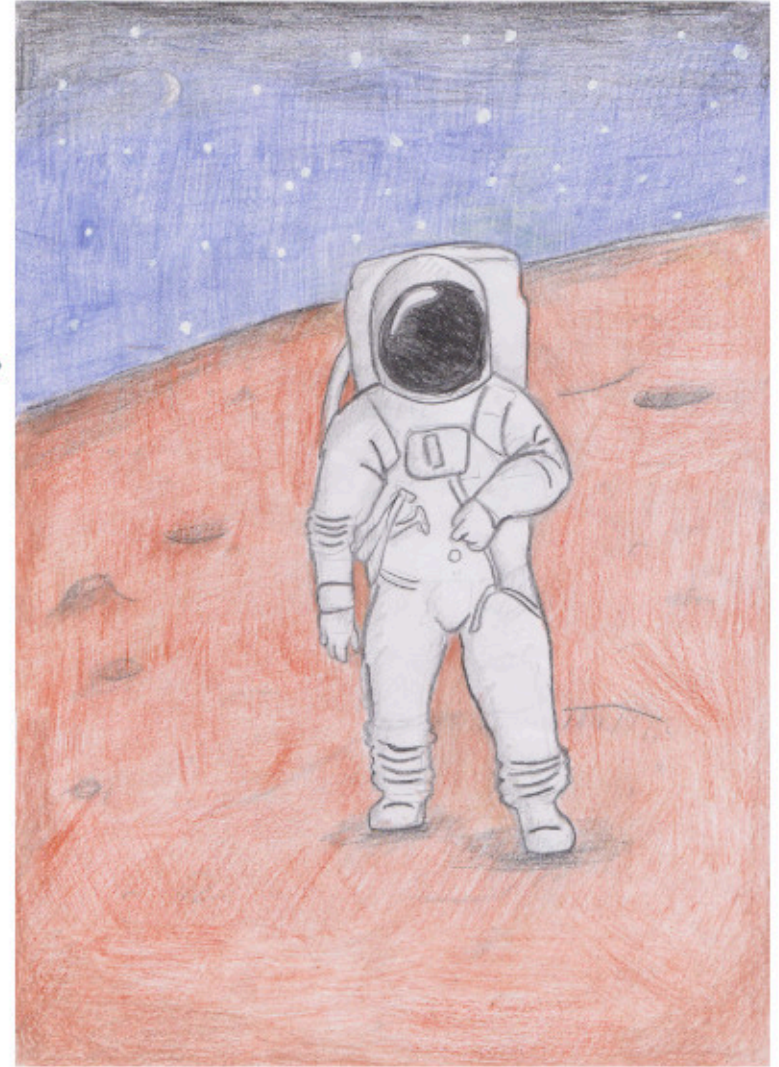
"Shall we all go?" Marianne asks.

"I think it's better. We should be able to face the temperature, any storm or natural phenomenon.

" replies Samantha.

"Okay, I think we're ready to go. Let's do it!" insists Marianne, "Nikola, you stay here just in case. Some problems may occur."

"Err... Fine, I'll stay..." says Nikola with a sad voice.



Seán and Marianne leave the landing ship and step on the Mars surface. The ground is dusty, full of stones, and the gravity is a little bit inferior to Earth's gravity. They explore the landing place for a couple of hours and find the frame of the Curiosity rover. It seems to have been disabled for a couple of months. "R.I.P. Curiosity..." mutters Seán.

At dawn, after a couple of hours sleeping, they begin building a shelter. Each of them has a task: Seán has the research material; Marianne handles the life-support system; while all the others construct the frame and cover it in canvas. It takes the whole day in order to finish it.

Since the average air temperature on Mars can drop to a very cold -62 degrees C, if the shelter is built above ground it would need to use heavy thermal insulation. The thin Martian atmosphere also requires the shelter to be airtight so that a near earth-like environment can be maintained inside. Air locks are also needed to prevent the precious oxygen-enriched breathable air from escaping into the Martian atmosphere as they enter or leave the shelters.

"I am so tired..." complains Nikola.

"Aff... me too..." grumbles Seán, "I need some rest."

"We cannot stop now... we need to sit down, and plan our stay here" adds Samantha. "We are a little bit short of resources. Let's go inside..."

As they enter the artificial atmosphere, they check if all the life-supporting systems are working. The oxygen pressure is okay and they can breathe comfortably inside. Then, they decide that the next day they will try to plant some vegetables so that they have enough supplies during their stay.

But not everyone is feeling well...

“ I am feeling sick... “ Marianne explains. “ I feel dizzy and I have a terrible headache “ she groans.



The others gather around her and yell: “OMG!!! “

EXPLORING MARS

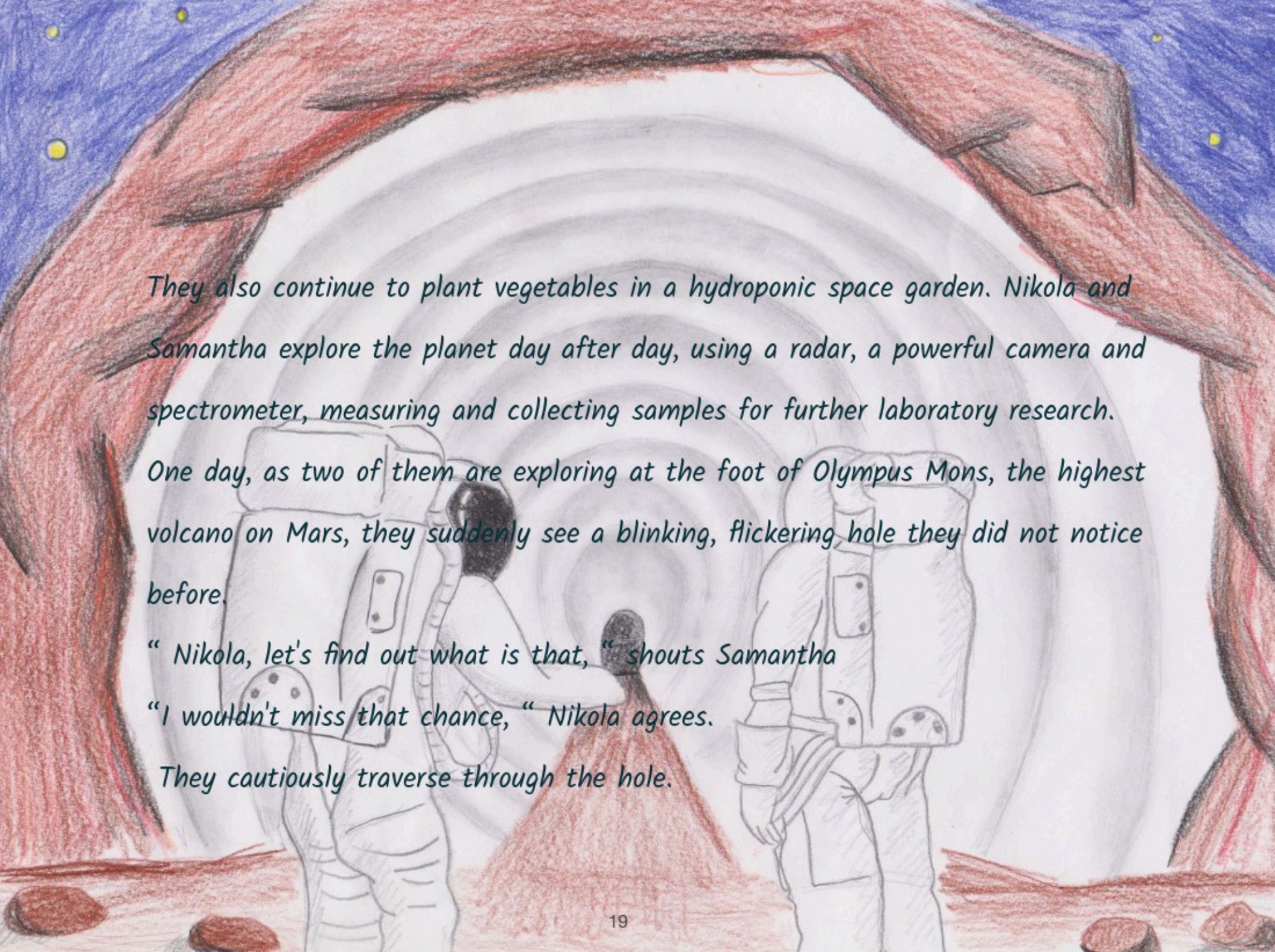
Samantha, Martim, Seán, Aina and Nikola are very concerned about Marianne.

A headache, dizziness, high temperature and red spots all over her body affect her for days.

“Is it contagious? Samantha asks.

Nobody answers. No one knows. They all feel helpless as the medicine they treat her with does not help her at all. They decide that one of them should always stay with her in the shelter.

They get to work improving the structure of another habitat built for the first tourists who booked a place on the first touristic flight to Mars. The habitat can turn, shapeshift, and it is self-sustainable.



They also continue to plant vegetables in a hydroponic space garden. Nikola and Samantha explore the planet day after day, using a radar, a powerful camera and spectrometer, measuring and collecting samples for further laboratory research.

One day, as two of them are exploring at the foot of Olympus Mons, the highest volcano on Mars, they suddenly see a blinking, flickering hole they did not notice before.

“Nikola, let's find out what is that,” shouts Samantha

“I wouldn't miss that chance,” Nikola agrees.

They cautiously traverse through the hole.



The sight they see in front of them is amazing. A variety of rock types, similar to rocks on Earth appears in front of them, but there are some they have not seen before, rocks that look like gemstones with unusual, colourful floating dust. They collect samples and return to their Mars camp.

They find the others gathered around Marianne. Her condition is still the same after three weeks. They are all very anxious. Nikola and Samantha take out the samples they have collected to show the others. As they show the bags containing the samples with colourful dust something very strange happens as they pass near Marianne. The dust suddenly changes colour and becomes completely yellow. They pass another bag near her.

“It's happening again!” Aina exclaims.

They can not get over their surprise as the dust changes colour when placed near Marianne's body. Red spots that were covering her body disappear. After several minutes, they witness Marianne opening her eyes, feeling weak but with the high fever having gone away. “What is that colourful dust made off? The scientists on Earth will have a lot of work to do to figure it out! “ says Nikola.

The next day Marianne is on her feet again. The astronauts begin to prepare the spaceship for their return to Earth. The first habitat designed for humans on Mars is complete and their mission on the red planet has come to an end. They look forward to a safe journey back to Earth and seeing their families again.

Safe home!



GLOSSARY

Astronauts - men/women who travel to space dressed into spacesuit, they need to know how to command, control or serving a rocket

Docking - the process of joining one spacecraft station module to another

ISS - International Space Station (ISS); the most substantial human-made body in low Earth orbit

Mars - one of the eight planets in our solar system, it is called „the red planet“, because rusted iron in it

Mars Rover - a robot which explores Mars

Olympus Mons - the highest volcano and mountain in the solar system, it is located on Mars planet

Orbit - the elliptical course of an object (a planet or a spacecraft) around a star or a planet

Phobos and Deimos - two moons of Mars

Spectrometer - a scientific instrument used for recording and measuring wave lengths of light spectra

FUN FACTS

Mars is farther from the Sun than Earth is, so that means it takes him longer to go around the Sun. Specifically, 687 days!

Mars has seasons like Earth, too. A typical temperature on Mars in summer is 5 degrees Celsius.

Mars has the tallest mountain in our Solar system! It's called Olympus Mons and it's 25 km tall.

Mars doesn't have a protective layer of atmosphere like Earth, so it cannot store heat from the sun. As a result, the temperature on Mars regularly drops to -125 degrees F (-82 degrees C) in the winter and only rises to 23

degrees F (-5 degrees C) in the summer

.Mars has two moons, Phobos and Deimos. (Translated from Latin – Fright and Horror).

It is 142 000 000 miles away from the Sun.

If you weigh 45 kilos on Earth, you will be about 17 kilos on Mars

Huge dust storms often occur on Mars' surface.

One big canyon on Mars stretches a distance that is the same as the distance from NYC to LA.

Mars was a name for a Roman god of war, for its red color.



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