

Ina explores space



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About the author and illustrator:

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School leaving certificate in fashion design
Study of Sociology / Gender Studies

“This children’s book was born from the idea to give my little niece something special for her birthday. It should be a children’s book that inspires girls to pursue their interests free of social stereotypes. And now we want to share this story with many other children.

I would like to dedicate this book to my niece Katharina and her grandpa, my dad.”



**Ina
explores
space**

Felicitas Fröhlich



There was once a girl called Ina.

She was very curious
and wanted to know how everything worked.
How cars moved and how planes flew.



***She was interested
in all***

the little things...



***... and in all the
big things too.***





***Ina was especially excited
by stars and planets.***

Her whole room
was decorated with them.

She had painted a starry sky with
planets and rockets above her bed.

***And a large poster
of our solar system
hung on the wall.***



One rainy afternoon
Ina, together with her parents,

***made a small model
of the solar system
in a shoe box.***

Find out more about the planets
in the solar system on page 44.





The next day

Ina took her solar system in a box to kindergarten and everyone was amazed.

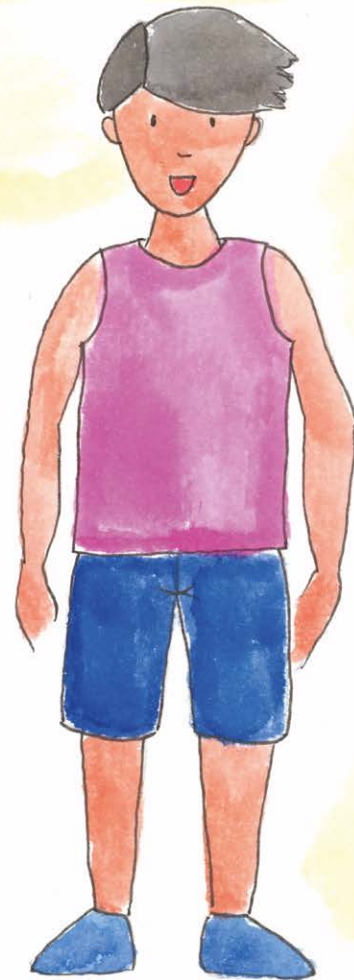
Her friend Tim had his sister's astronaut figure
with him and with it

***they could play
space explorers
together.***





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**Ina and Tim and their
friend Alex
came up with an idea:**

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Eager and excited, the three of them asked their kindergarten teacher Helene to build a rocket with them which was big enough to sit in.

Helene thought this was a great idea and the very next day she brought everything they needed to build a rocket:

**a big sheet,
clothes pegs,
lots of paper stars,
some balloons
and a string of lights.**

From then on, the rocket stood between the doll's house corner and the construction crane. Ina, Tim and Alex could travel to new worlds in it and have star adventures far out in space.





***Ina, Tim and Alex played
with the rocket
in the play corner
for a very long time.***

And later on in school too,
the three children
continued to be friends.



Ina liked going to school.
She liked science and maths best.
That is why she was especially
happy when her class went on
trips to the Technical University.

***There the children could
take on the role of researchers
and conduct a whole variety
of different experiments.***

Ina continued to be fascinated by stars and planets. She also still liked to let the numbers dance.

That is why she studied mathematics at a technical university, and later worked there as well.

Ina met other people at the university who had the same interests as her and they decided to do a joint project.





They wanted to fly to the moon together,
to bring back some moon dust.

Where and how the rocket needs to fly
had to be very precisely calculated.

***Ina and her team
were able to complete
this task.***

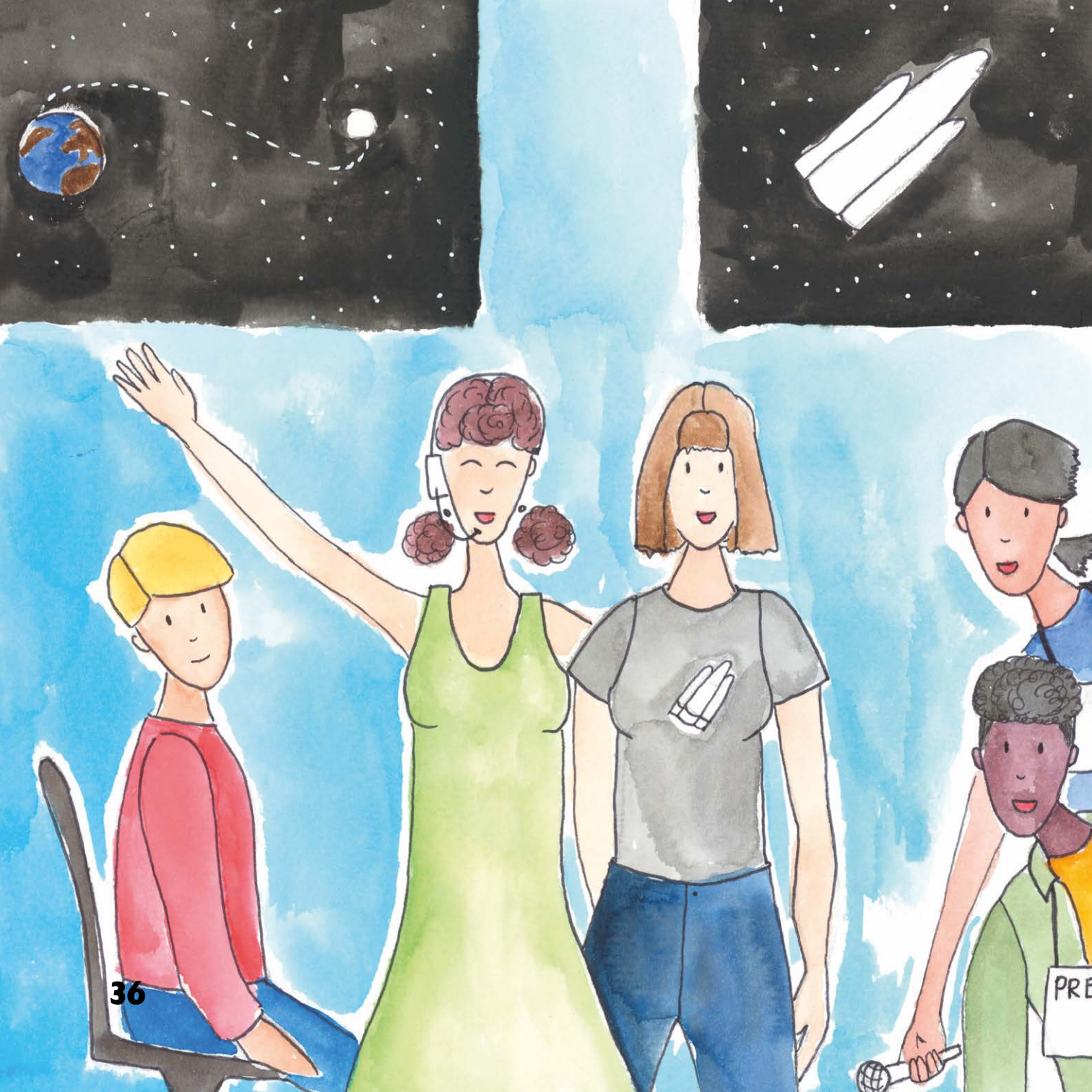
On the day of the rocket launch
Ina was both nervous and excited,

**but she believed in herself
and in her team.**

Tim and Alex were also there at the launch of
the rocket, to keep their fingers crossed for Ina.
The rocket launch went smoothly, it flew without
any problems and came back to earth safely.

**Ina had calculated
everything correctly.**



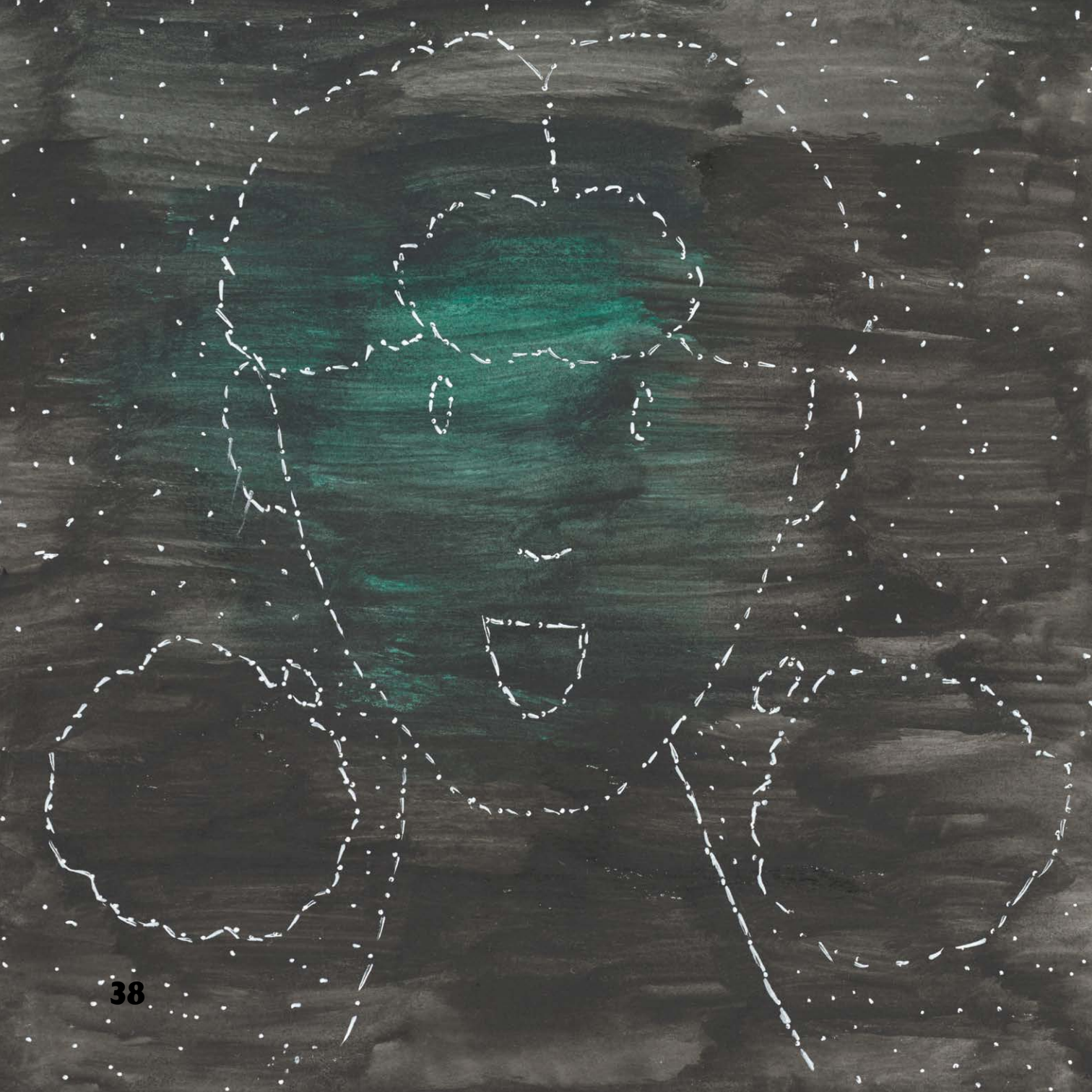


Tim and Alex were also present at the launch of the rocket and kept their fingers crossed for Ina.

When it was back on earth, the researchers could generate the energy they wanted to.

(Note: You can find out why this is on page 42 and page 51 in the appendix.)

This was enough energy to run lots and lots of cars.



And our Ina?

She is already at it again,
letting the numbers dance in her head...

Perhaps she will soon fly to the moon herself
to carry out further experiments.

**Here you can
find out more
on the topics
in this book**

What is Ina's team doing on the moon?



The moon has no atmosphere unlike the Earth. The Earth's atmosphere is a layer of air which wraps around the Earth.

The atmosphere protects the Earth from too much solar wind (strong streams of plasma and particles which come from the sun).

Because the moon doesn't have such a protective layer the plasma and tiny particles land on the moon's surface.

Among them is an element Helium-3. This could be used all over the world in nuclear fusion reactors to make electricity



The advantage of Helium-3 is that using it to make electricity produces waste is much less hazardous and doesn't produce any CO_2 .

This would be good for our atmosphere.



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Make a solar system in a shoebox with Ina

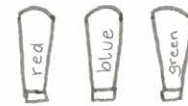


What do you need?

Shoe box



Paints



Styrofoam balls



Paint brush



Yarn



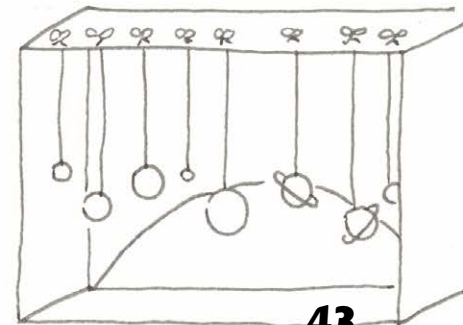
Glue



Needle



- ① Thread the needle through the ball, so as to secure the yarn.
- ② Paint the balls so that they look like planets. You can use the pictures in the book to inspire you or you can make up your own planets.
- ③ Paint the shoebox to look like space. Paint a yellow semi-circle at the back of the shoebox to represent the sun.
- ④ Punch holes in the top of the box, and tie the planets through them with the yarn.



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Size Comparison of the planets with 'tangible' things

The Sun: big gym ball

Mercury: small pea

Venus: cherry

Earth: cherry

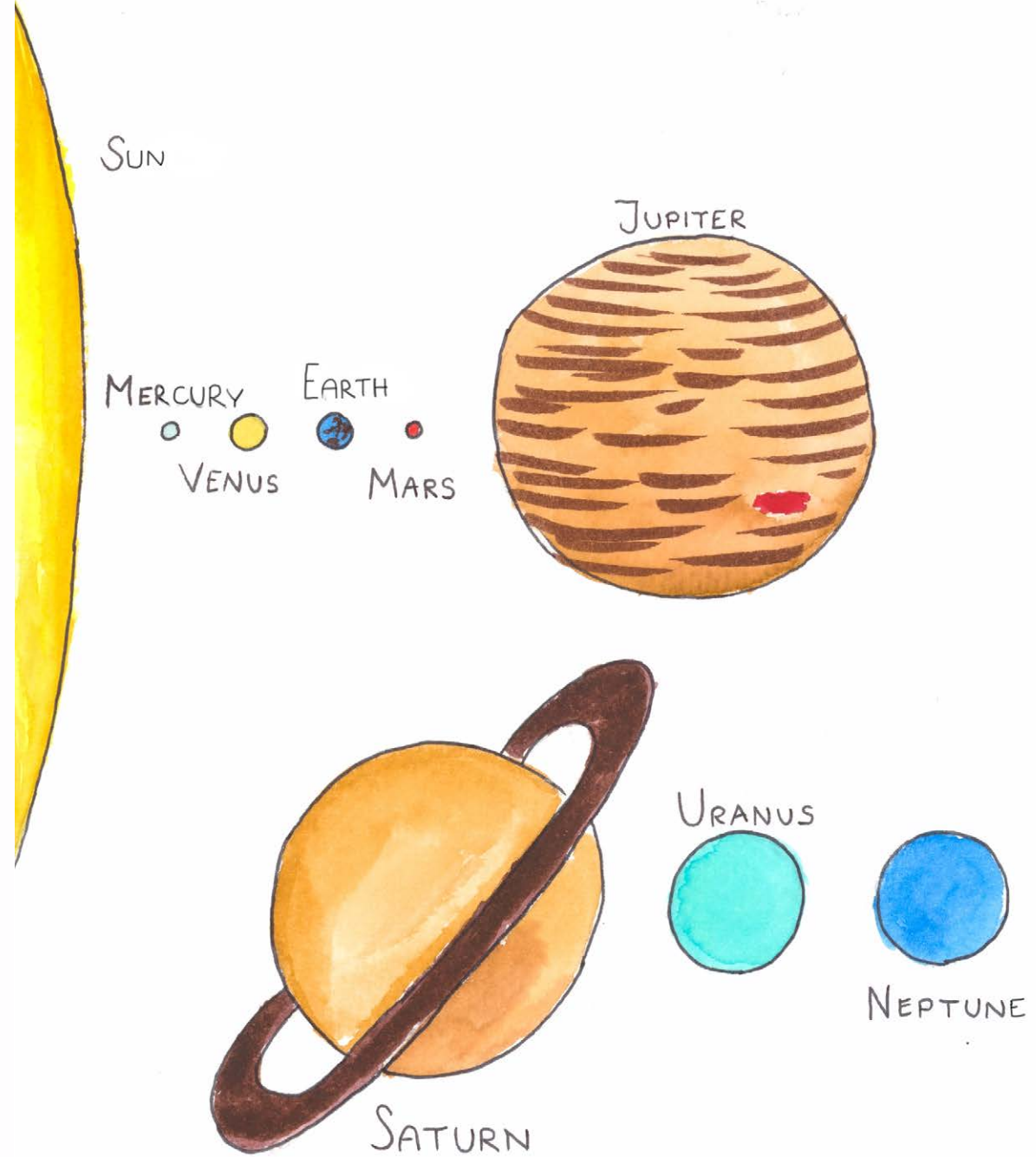
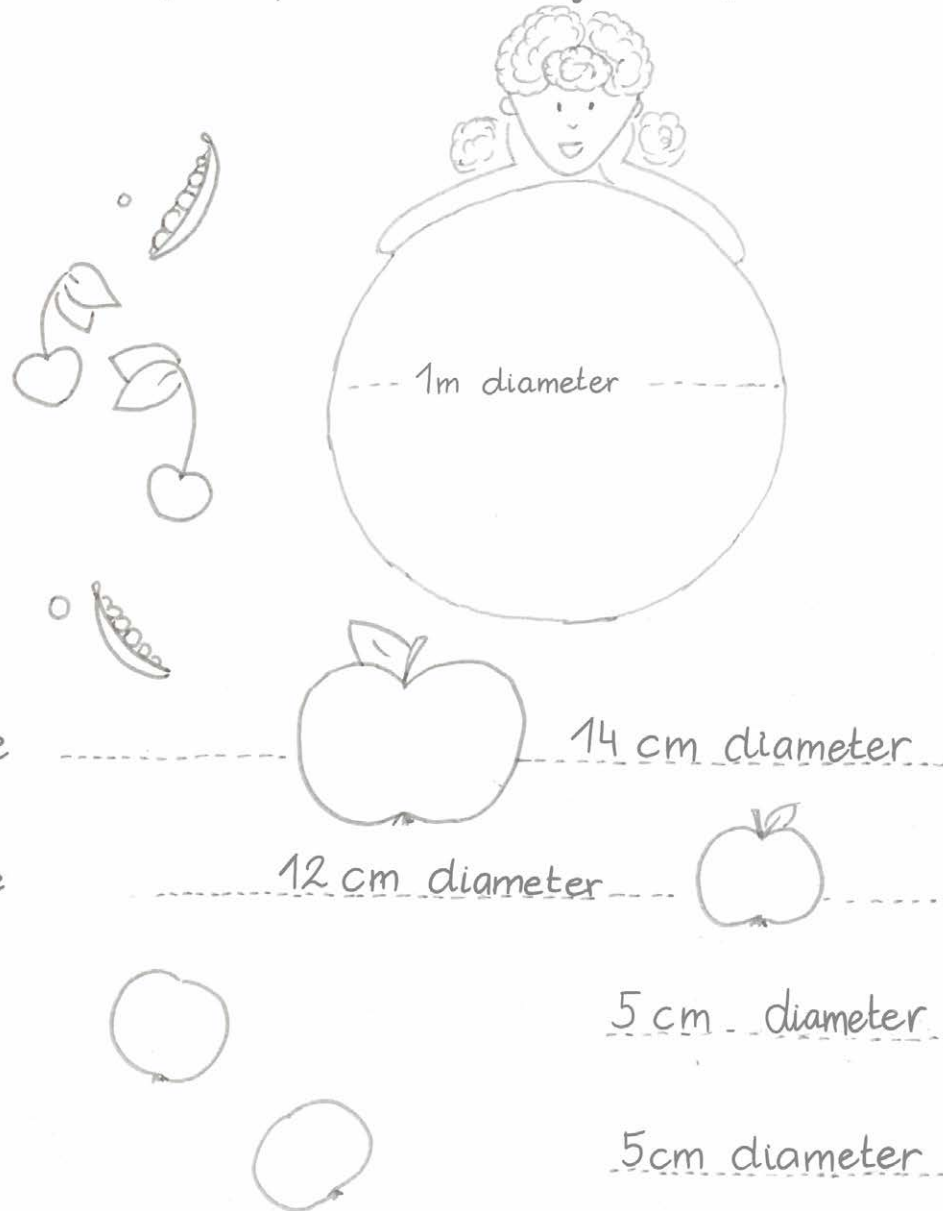
Mars: large pea

Jupiter: large apple

Saturn: medium apple

Uranus: tangerine

Neptune: tangerine



Why is this story about a girl exploring space?

Gender stereotypes are still widespread in the school and education system. Statements such as „girls are not good at maths“ and „boys are worse at reading“ are still stuck in the minds of many. If these images are reproduced in the social environment of young people, they influence their self-assessments of their own abilities, interests and professional ideas.

For example, studies which interviewed women in STEM fields of study (STEM= Science, Technology, Engineering, Mathematics, known in German as MINT = mathematics, information technology, natural sciences and technology) show how strong the influence of these stereotypes is. If these women are asked in retrospect about the factors that influenced their decision to study in a particular field of study, the main focus is on their school experience, in addition to the support they received from their social environment. The results show that stereotypical views influence the self-assessment of one's own abilities in STEM subjects, weaken self-confidence in this respect and thus also the effectiveness of these gender stereotypes and normative conceptions of women in „male professions“.

In 2019 Graz University of Technology celebrated 100 years of women in technology studies. In April 1919 women were admitted to technical studies in Austria for the first time. However, female students remained an exception in the following decades. For example, only one or two women per year completed a technical degree in Graz. Until the 1960s, the number of female graduates remained in the single-digit range. Over the next twenty years, an average of 10 to 15 women per year completed a degree course at Graz University of Technology. Only after 1980 did the number of female students rise steadily, but these days the proportion is stable at around 25 percent.

Graz University of Technology would like to appeal to people of all genders equally and recruit them as students and employees and integrate them into research and teaching. The Office for Equal Opportunities and Women's Promotion supports this project with numerous measures, especially to increase the proportion of women.

The promotion of female pupils in scientific and technical professions is pursued in various projects:

FIT - "Frauen in die Technik" Women in technology

The aim of the FIT initiative is to encourage schoolgirls to study technical or scientific subjects.

- Direct school visits by students of technical and scientific disciplines as FIT ambassadors.
- Annual FIT information day to get to know the university and its offers through institute presentations, lectures, laboratory exercises and discussion groups.
- Participation in events such as school fairs and supra-regional fairs like the BeSt3 in Vienna and the federal provinces.

www.fit.tugraz.at

T³UG - "Teen Treffen Technik" Teens mee tech

Every summer, around 90 schoolgirls aged 15 and over are given the opportunity to get a taste of the technical air at Graz University of Technology as part of holiday jobs. These pupils are integrated into the scientific everyday life of the institutes, participate in course preparation and research activities. They are supervised by a research associate - even beyond the holiday job if needed, for example in the context of school projects, pre-scientific theses or in their choice of studies and career.

CoMaed - "Computer und Mädchen" Computers and girls

Discovering and exploring computers in a playful way, gaining a first insight into technology and science, strengthening your self-confidence in technical skills - this is what happens at CoMaed, the summer computer courses for girls aged 10 and up.

www.comaed.tugraz.at

Moon dust as an energy source

The idea of obtaining a clean and efficient form of energy from the moon has inspired science fiction stories as well as new research in recent decades.

Here you can get some more information about it:

[www.esa.int/Enabling_Support/Preparing_for_the_Future/
Space_for_Earth/Energy/Helium-3_mining_on_the_lunar_surface](http://www.esa.int/Enabling_Support/Preparing_for_the_Future/Space_for_Earth/Energy/Helium-3_mining_on_the_lunar_surface)

In contrast to the Earth, which is protected by its magnetic field, the lunar dust on the lunar surface has been enriched with large quantities of helium-3 by solar wind. It is believed that this isotope could provide safer nuclear energy in a fusion reactor, as it is not radioactive and would not produce dangerous waste products.

Ina explores space

Ina is an explorer. Even in kindergarten she wants to examine everything closely and explore her surroundings. Before long that isn't enough for her. Soon she discovers her love for space and she never lets it go.

First, together with her kindergarten friends Tim and Alex, she converts the children's kitchen into a new type of rocket, and later she continues intrepidly on her way and studies mathematics at a technical university. And then the time comes – Ina and her colleagues are ready to send a real rocket to the moon. Her childhood dream has come true. And what has become of her two friends?

A short accompanying text in the appendix provides the persons reading, especially parents and educators, background information and further suggestions.

This book is one of a total of 6 children's books published by the Verlag der Technischen Universität Graz.

The series focuses in particular on those values that form the foundation of the educational care of children at Graz University of Technology: tolerance, openness and appreciation of fellow human beings, animals, diversity, nature as well as technology and natural sciences.

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