

# Harmonic



It all matters, the big things and the small stuff, a single atom in a sea

This comic book is a collection of works by people from various colleges, places and interests who responded to the question 'What does STEAM mean to you?' It embodies a snapshot in time of our collaborative experiences working together. Alongside the credits, are a few words that describe our journey, our process' and hopes for this comic book.

**'A Journey with Gladys West'**  
Script by Nicki Bond  
Preliminary Art by Alise Bagaeva  
Art by Amy Greene & Francesca Minascurta

**'Wally's Travels'**  
Art by Kala Chung

**'Much Room For Mushrooms'**  
Script by Olivia Jade  
Art by Ananya Singh

**'The Deepest Sea'**  
Art By Ellis Espina

**'Visit 255J!'**  
Script by Maria Semerkina  
Art by Maria Semerkina & ZhangYu Yu  
Additional Colours by Alanna Ní Mhiacháin

**'Nurture Nature'**  
Art by Stella de Burca

**'Glimpse'**  
Script by David Kelly  
Art by Weronika Mitura & Nicola Richardson

**'Mr Shark's Voyage with Friends'**  
Art by ZhangYu Yu

**'Project Conservation'**  
Script by Connie Heather  
Art by Azalin I. Rothwell & Stella de Burca

**'It's Fun to Bond!'**  
Art by Sadhbh Ní Riain

**'A Chip In Time: Insert Data and Reverse'**  
Script by Oumba Kodia  
Art by Kristen O Connell

**'Twin Paradox'**  
Script by Amy Barter  
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We are all made from stars, a mix of art and science, energy and matter, all in motion every day!

Bridges between logic and creativity

Go team!

Go into the unknown to discover, learn new things and try everything!

I'm so excited to share the comic book with everyone!

Exchanging Ideas

Time to think and reflect

Community and togetherness

Canvas of Imagination

Understanding the planet we call home and the people we share it with

Our Past, Present and Future!

Expression, trust and recognition of each other  
Opportunities to discover with new friends and find new ideas

Collaboration is key

Artistic Transformation

Ideas  
Converging

Follow your dreams

Imaginative Harmony  
The future belongs to us all!

STEAM is all around us no matter where you are

Stay curious and keep exploring!



I think we are lost.

We are not lost! I know exactly where we are.

Yeah, not at Granny and Grandad's new house!

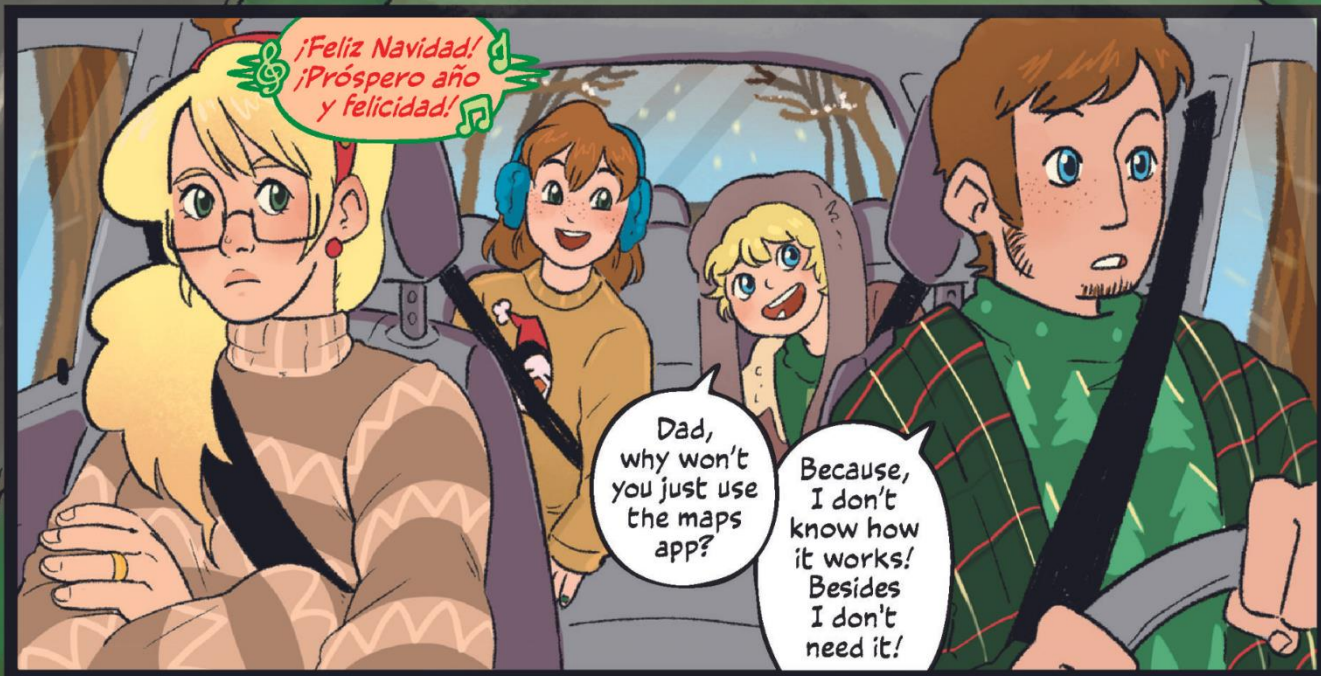
**N**ewtowncashel,  
County Longford.  
Present Day.



I'm sooooo bored!

Yeah, we've been driving for ages.

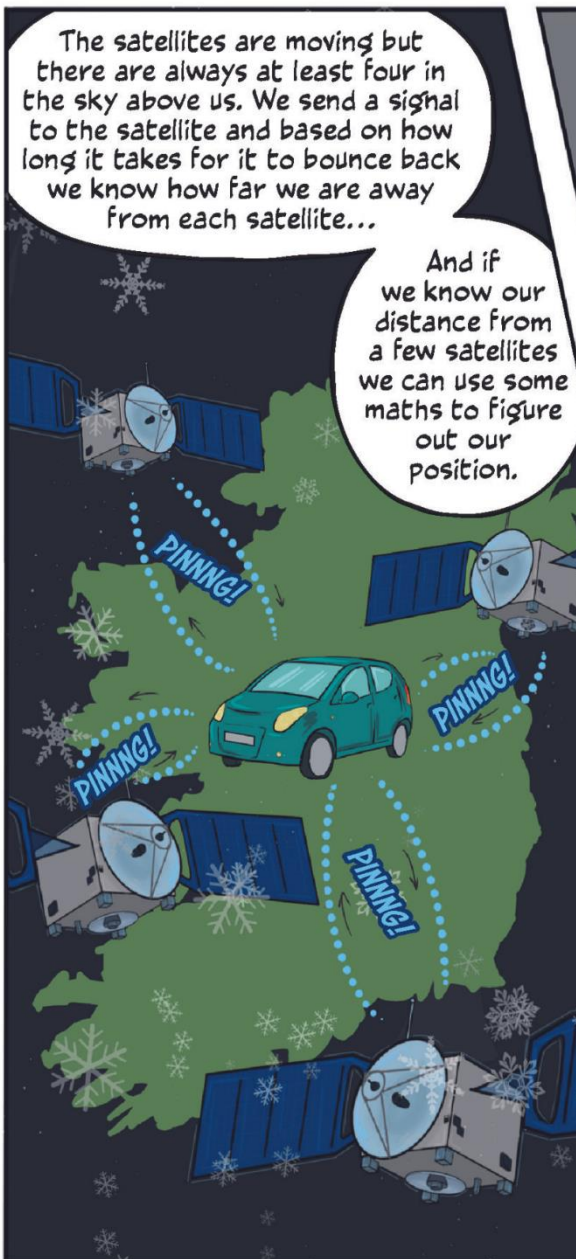
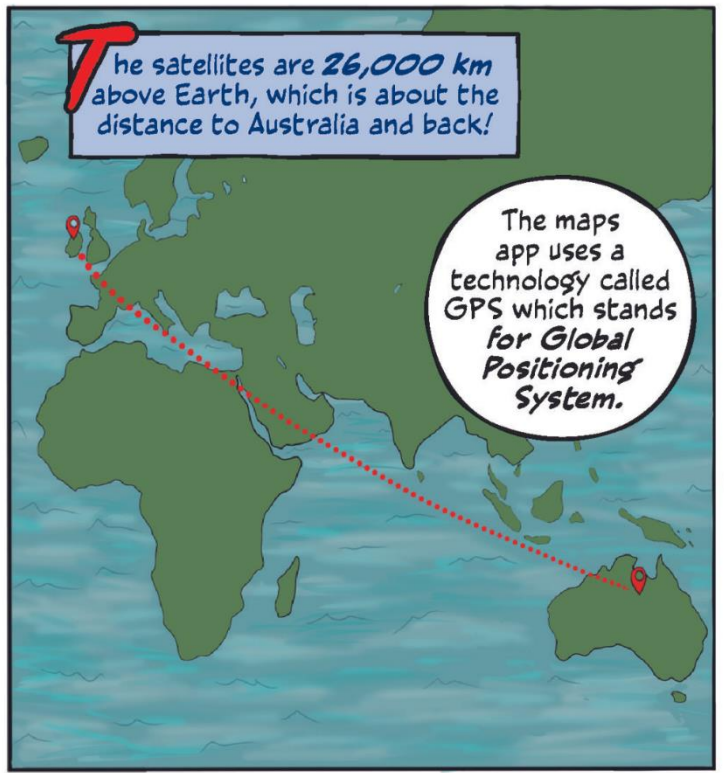
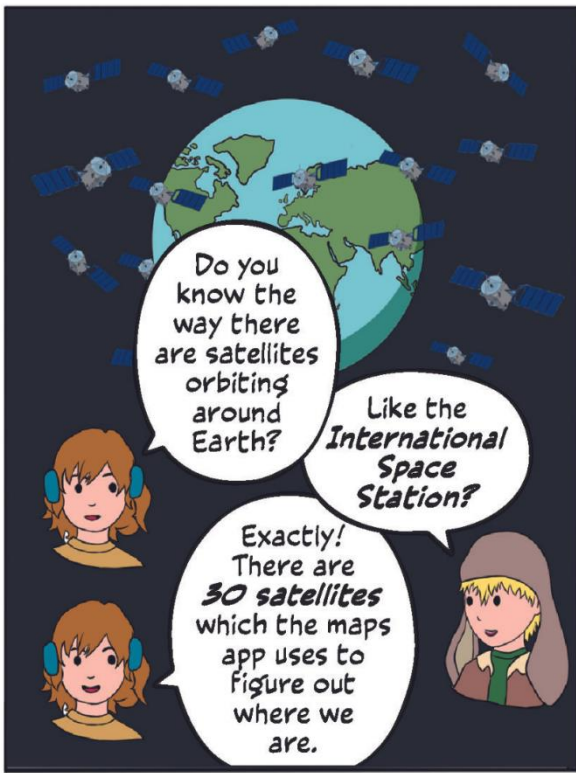
You said it would only take twenty minutes to get to their new house.



¡Feliz Navidad!  
¡Próspero año  
y felicidad!

Dad, why won't you just use the maps app?

Because, I don't know how it works! Besides I don't need it!





✓ Virginia, USA.  
1937

Hi,  
my name  
is Gladys  
West.

Growing  
up, I lived on  
my family  
farm.



I also  
loved learning  
new things in  
school. Maths  
was my  
favourite  
subject.

I decided  
I wanted to  
keep learning  
maths when I had  
finished school  
so I studied  
mathematics  
in college.



In the 1950s computers  
were really big and  
took up whole rooms!

After  
college,  
I worked on  
**Project Seasat**.  
Our team used  
supercomputers and  
maps to build a model  
of the sea levels and  
heights of mountains  
and hills on Earth.  
The Maps app  
still uses this  
in its GPS  
system.



And that's how Gladys West helped invent GPS.

Haven't we passed this hurling club already?!



I know exactly where we are! We are almost there. And **NO!**, it was a different club.

Wait, that's the shop near our house...

And that is our house! We've gone in a circle. We are back where we started.

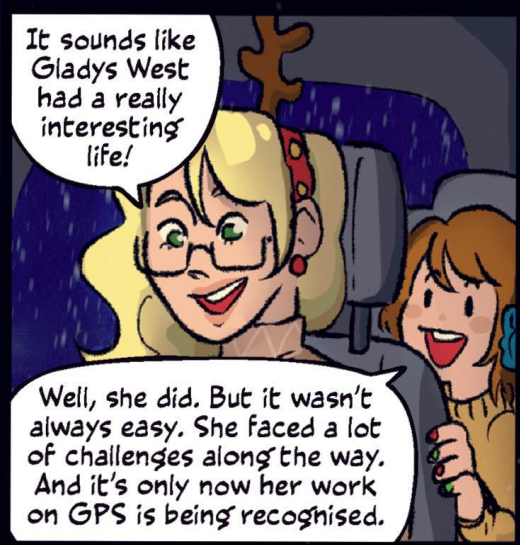
Ugh!



Can we please use the Maps app?

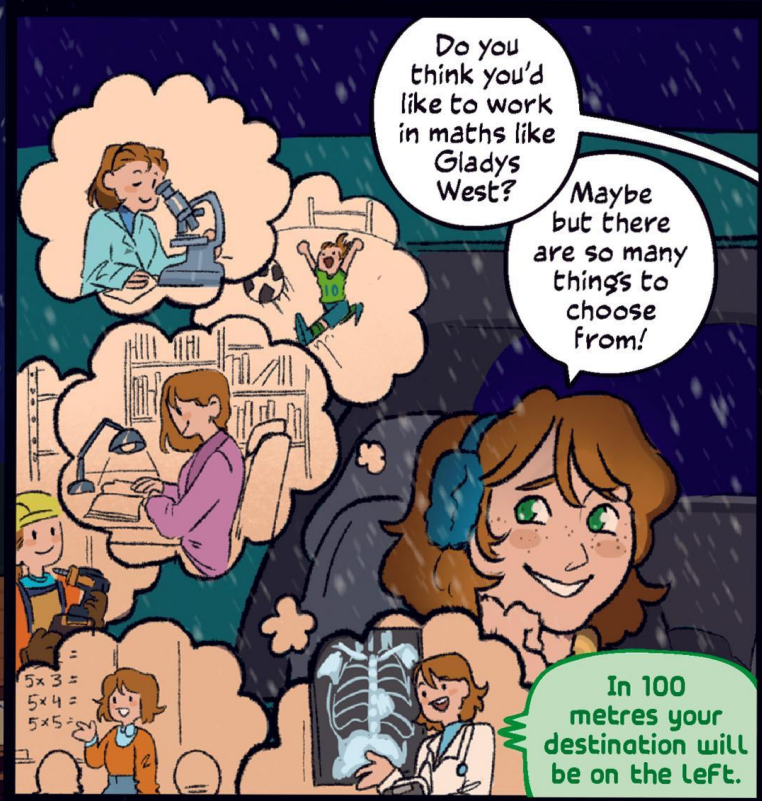
Fine! Since I understand how it works now, I don't mind using it.

In 800 metres, at the junction, turn right.



It sounds like Gladys West had a really interesting life!

Well, she did. But it wasn't always easy. She faced a lot of challenges along the way. And it's only now her work on GPS is being recognised.



Do you think you'd like to work in maths like Gladys West?

Maybe but there are so many things to choose from!

In 100 metres your destination will be on the left.



Happy Christmas!

Happy Holidays!

How are ya?

You made it!

Sorry we are late.

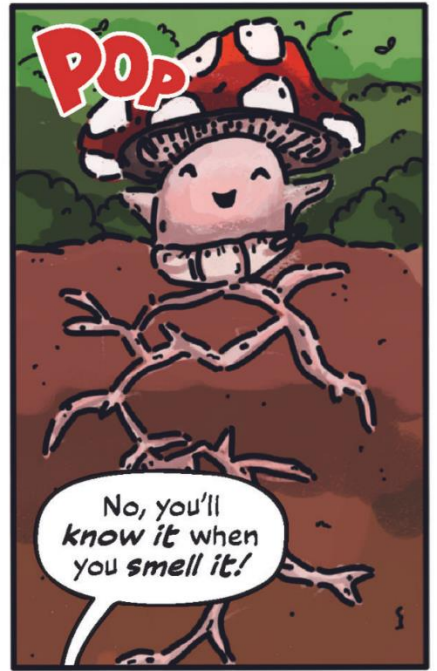
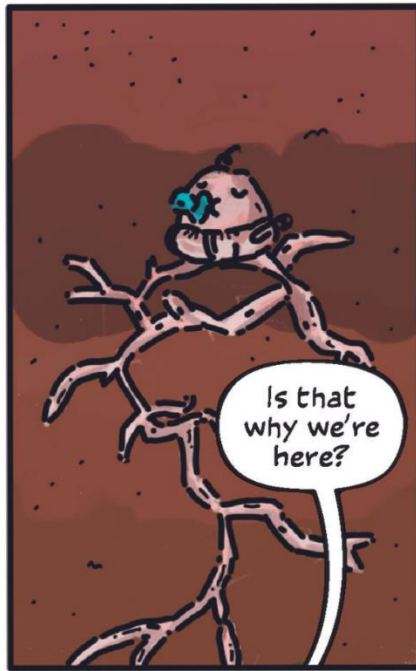
Sure we wouldn't start without you and you are just in time for dinner!

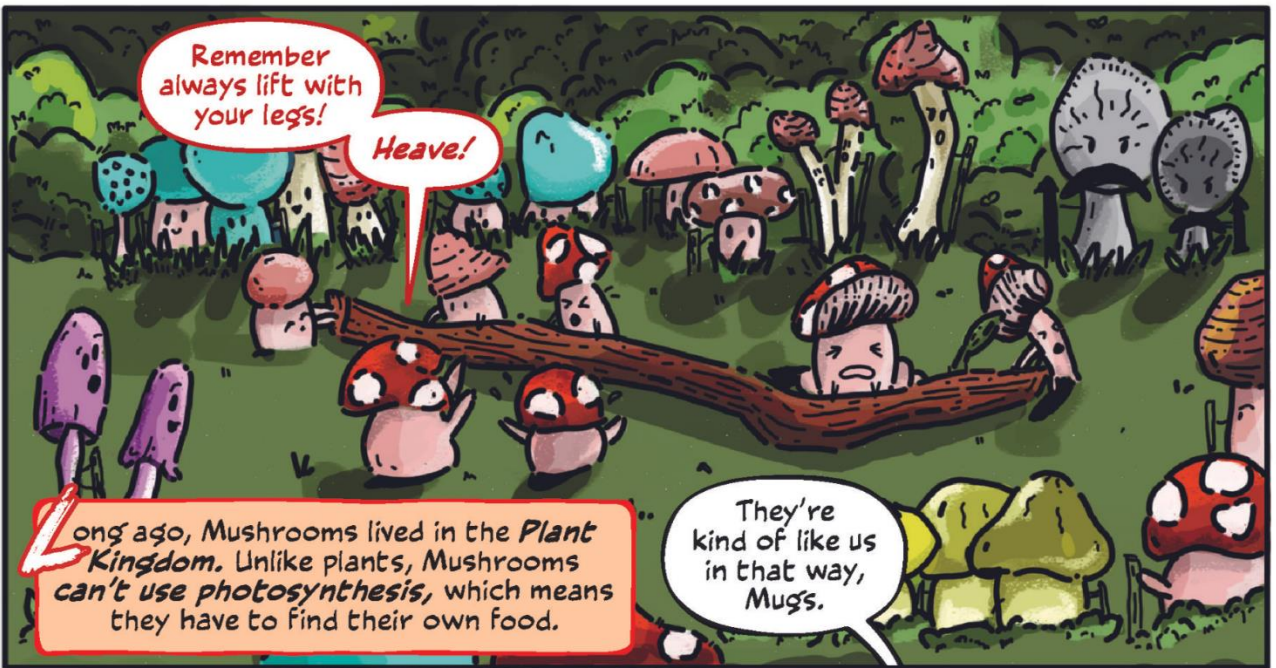
THE END









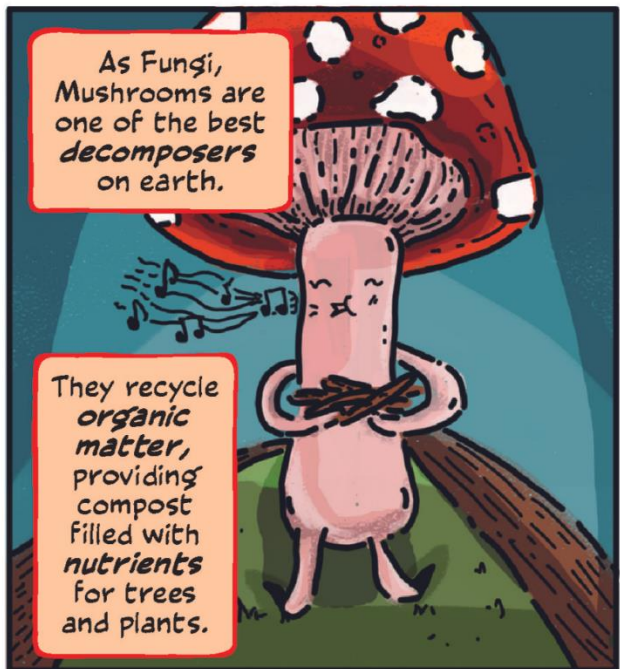


Long ago, Mushrooms lived in the *Plant Kingdom*. Unlike plants, Mushrooms can't use *photosynthesis*, which means they have to find their own food.

They're kind of like us in that way, Mugs.



Some Mushrooms would *feed on plants*. others would work together with the *Plant Kingdom*, sharing food and swapping recipes.



As *Fungi*, Mushrooms are one of the best *decomposers* on earth.

They recycle *organic matter*, providing *compost* filled with *nutrients* for trees and plants.



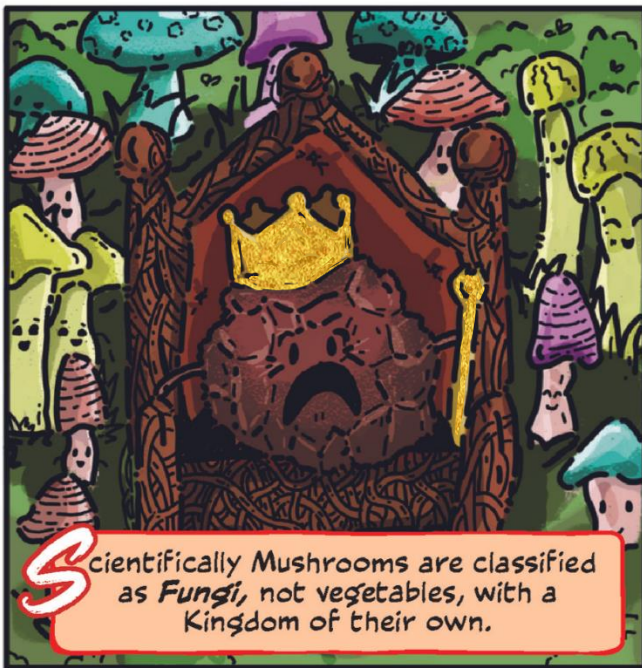
Without them we'd be snouts' deep in last years leaves, branches and other things you don't want to hear about...

SCRAPE!



Like poop?

...Like poop.



Scientifically Mushrooms are classified as *Fungi*, not vegetables, with a Kingdom of their own.



**SNIFF?**  
Hold on, Hank. do you smell that?

Smell what?

**SNORT!**  
Think I picked up a scent. It's delicious!

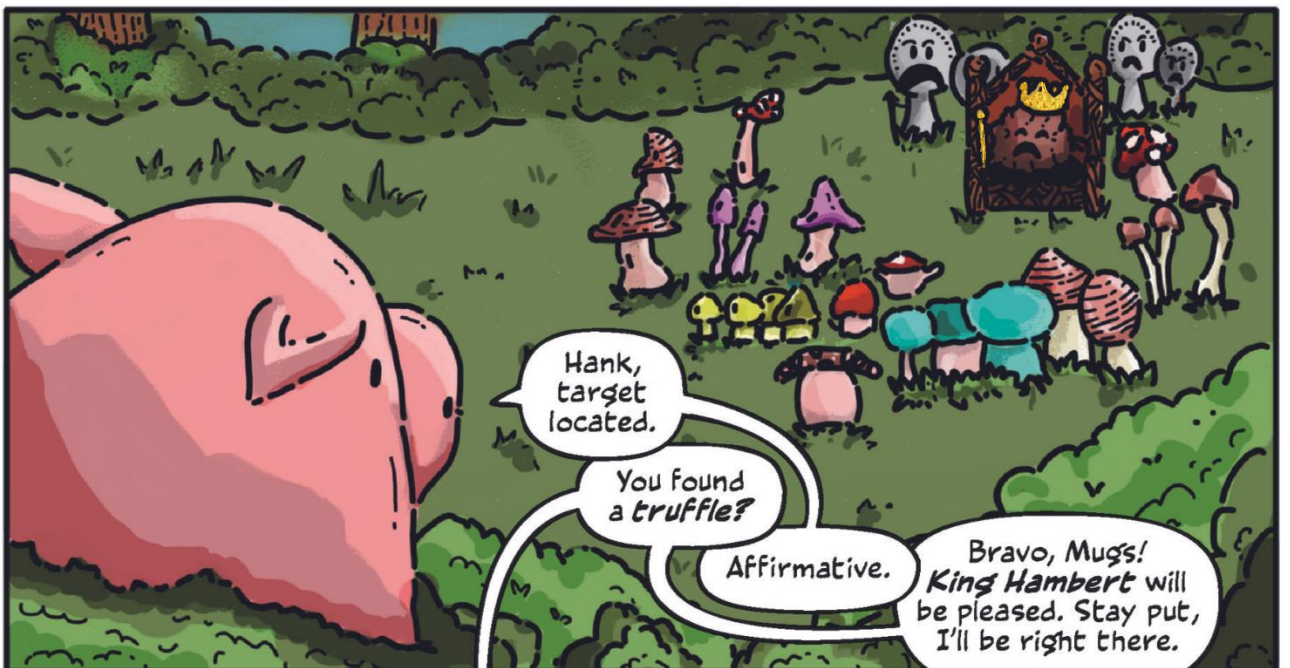
I'm gonna go investigate.



But be careful as some are edible...



...and some are *poisonous* and must never be eaten!

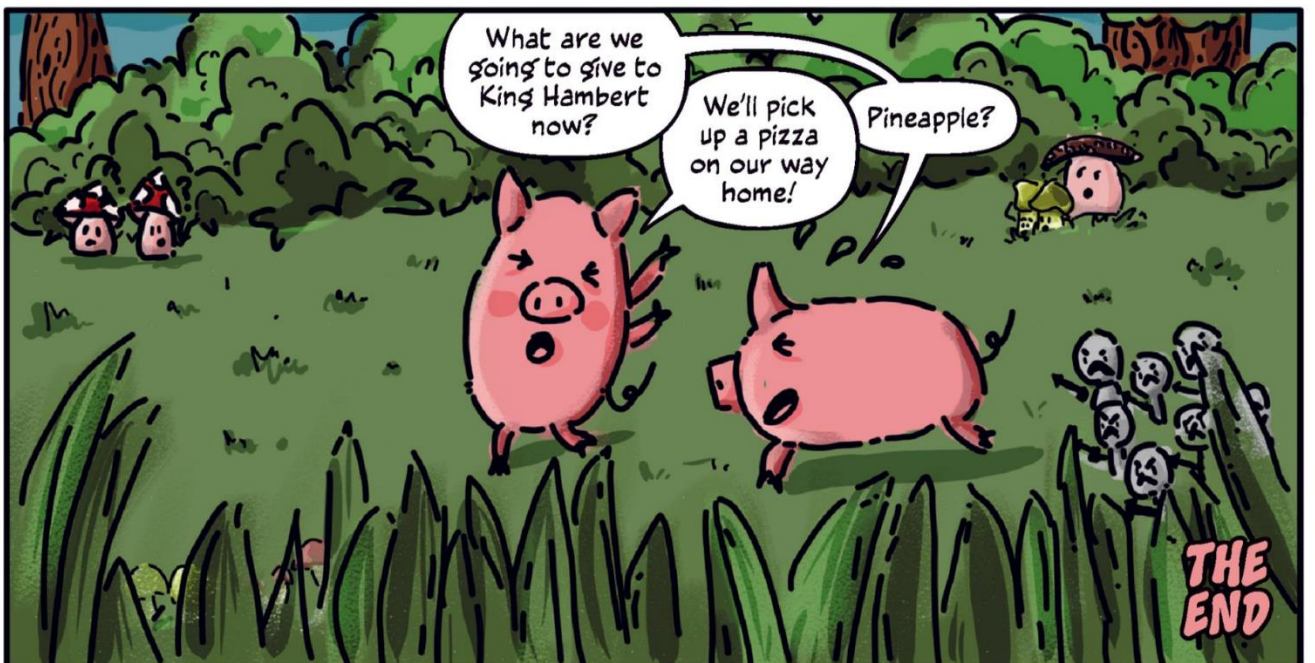
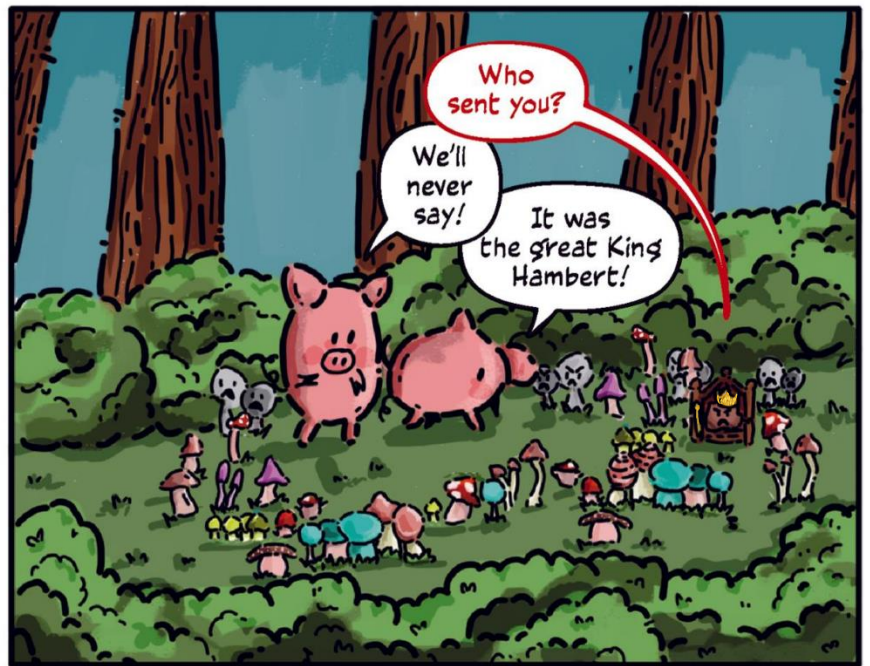
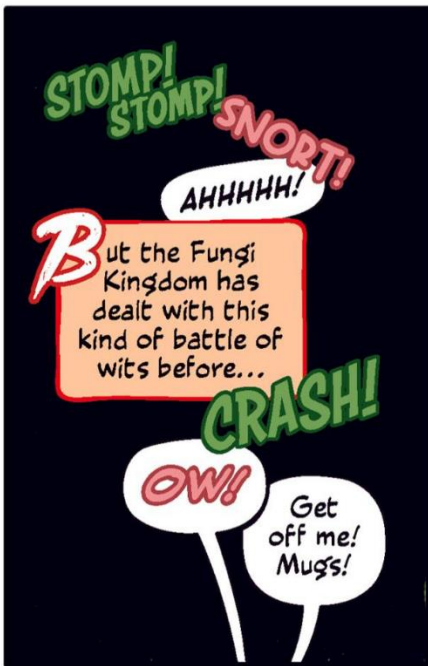


Hank, target located.

You found a *truffle*?

Affirmative.

Bravo, Mugs! *King Hambert* will be pleased. Stay put, I'll be right there.



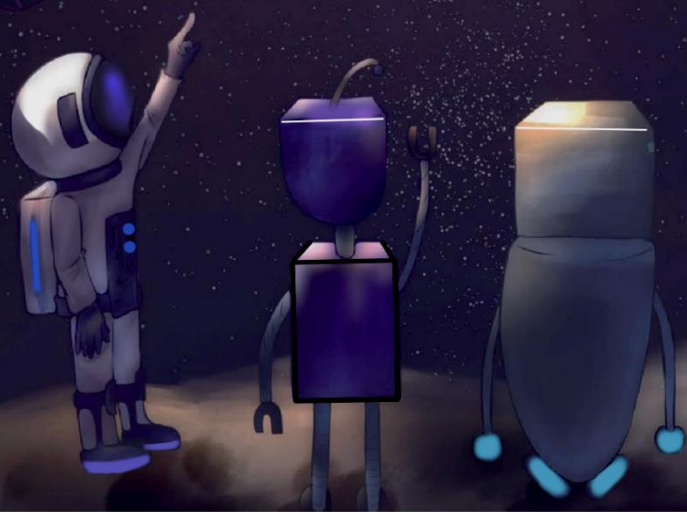
MURMURE  
MURMURE

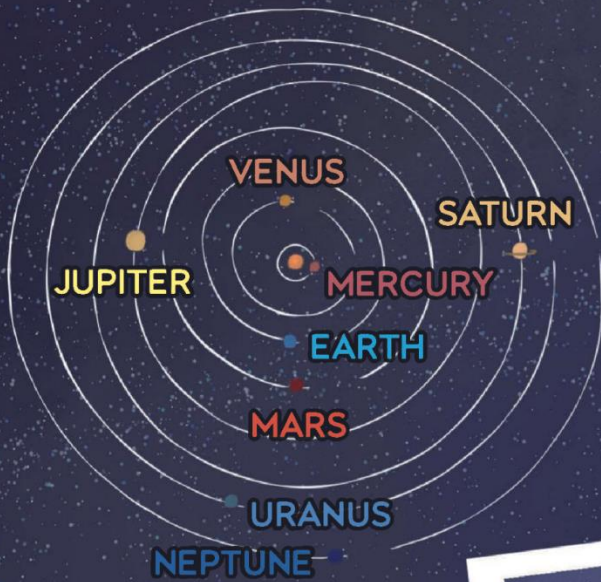


# DISCOVER SOLAR SYSTEM 255J

WITH  
ADVENTURES  
ON EVERY  
PLANET!

WHOOOSH!





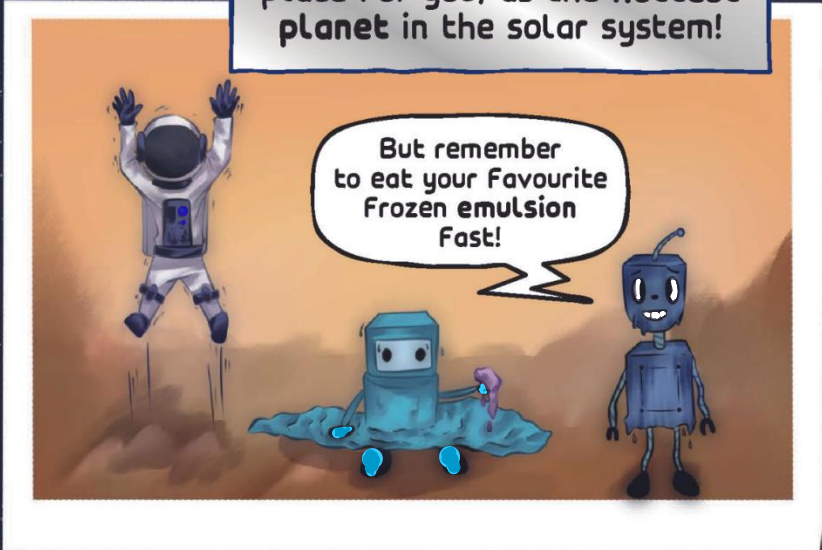
With eight beautiful planets to choose from, you can experience any weather with any temperature!



As the closest planet to the sun Mercury is the perfect place to bask under the sun!

## MERCURY

Looking for a luxurious getaway with thermal pools and saunas? Venus is the place for you, as the hottest planet in the solar system!



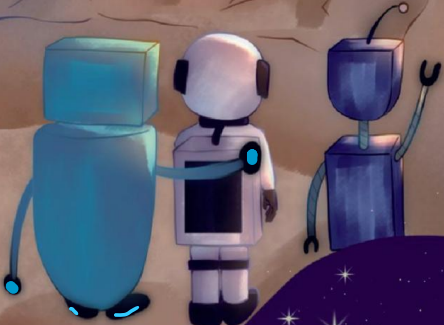
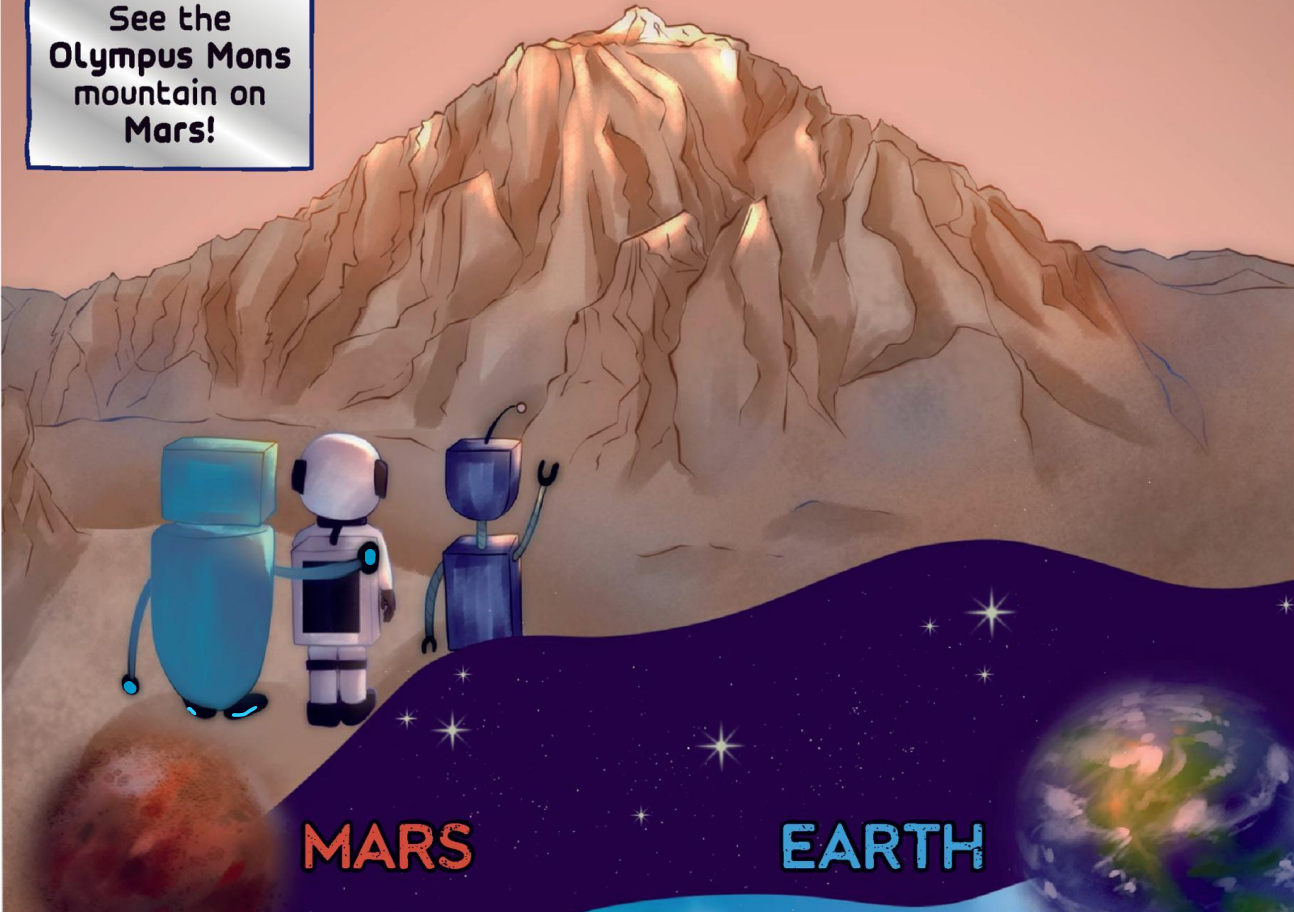
## VENUS





**F**ind your paradise in the Goldilocks Zone!

See the **Olympus Mons** mountain on Mars!



**MARS**

**EARTH**



**Earth**, a planet populated by curious innovative humans, intelligent animals big and small, beautiful plants and lots, lots more! it is the liveliest planet you'll see!

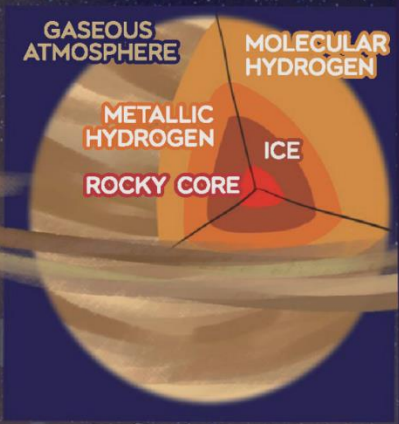
It's amazing! I have never seen liquid water before!

SHOOSH



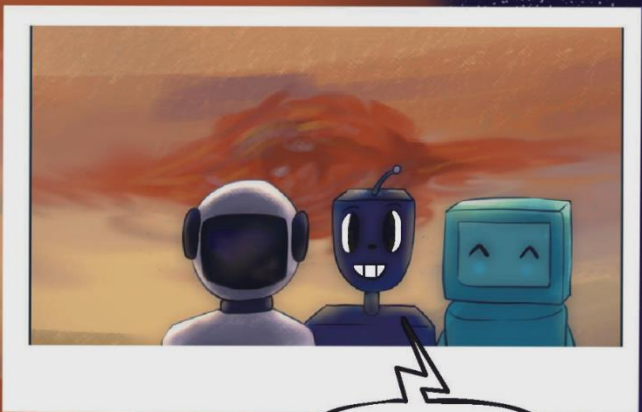
**S**ee the distinct Rings of Saturn!

# SATURN



WHOOOSH!

Or visit Jupiter's Great Red Spot, with a continuous storm that has been spinning for hundreds of years!



WHIRL!

Wow, Jupiter is the largest planet of them all and is such a breeze to visit!

# JUPITER

**A**s the furthest planets from the sun, these icy planets are perfect for those that like a winter getaway!



URANUS



NEPTUNE

To find your way, take Exit 255J...

...and turn left onto the Helix Nebula in the Milky Way Galaxy!

Then continue on until you reach the Dwarf Planet, Pluto!

HELIX  
NEBULA

PLUTO



We look forward to welcoming you to this beautiful Solar System!



THE  
END

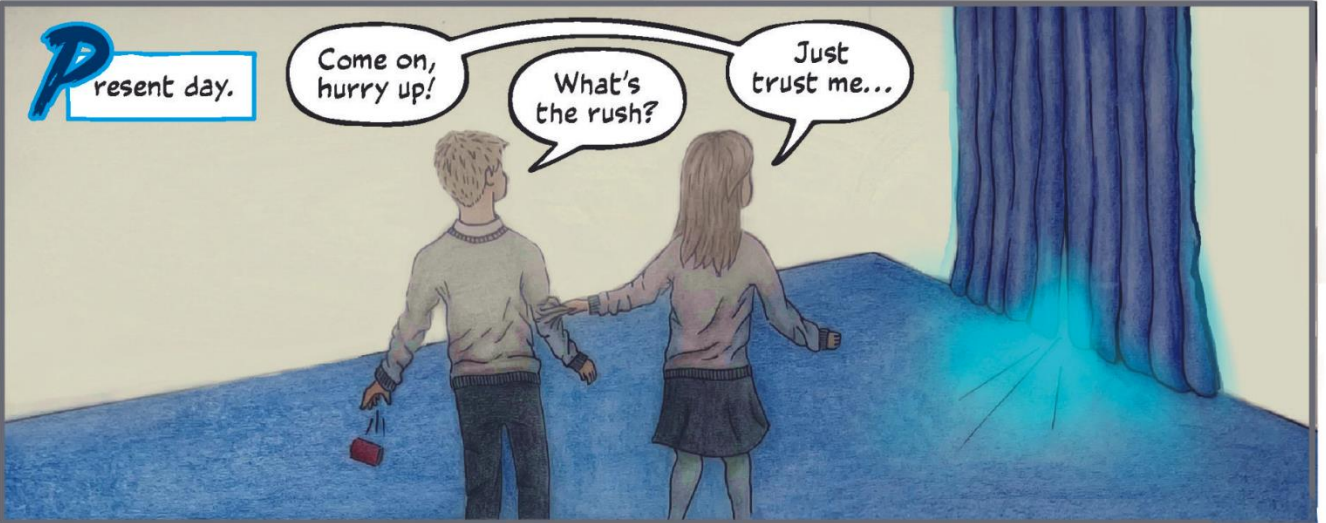


**P**resent day.

Come on, hurry up!

What's the rush?

Just trust me...



No way!

Told you so!

Where are we?

The Desert, I think?

**WHOOSH!**



It looks like there used to be water, the sun has dried it all up!

Follow me, there's so much more to see!

What's with these doors?

Just come on!



Oh yuck! This isn't the one I was looking for.

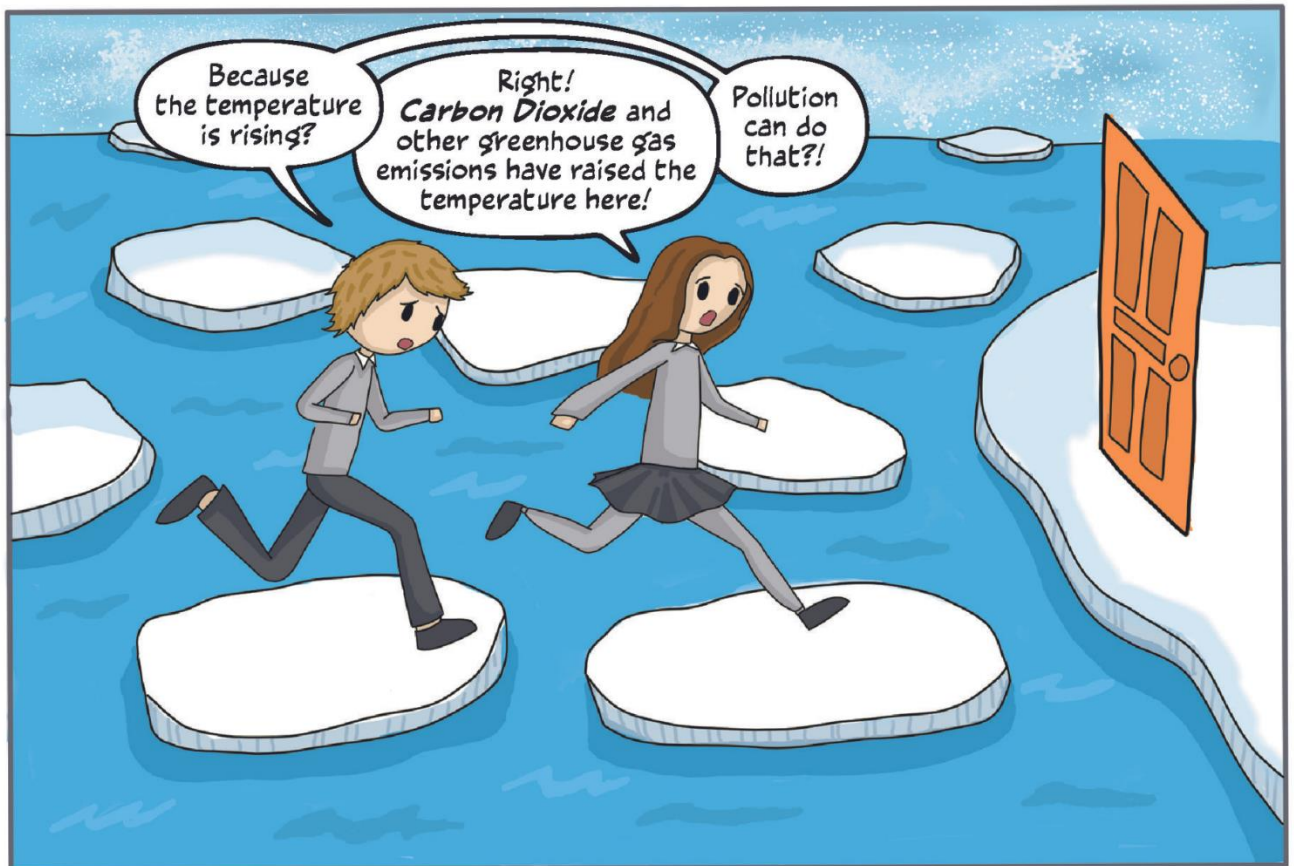
No way! So these doors lead to different places?

Yep!

What happened here though? This water looks... different!







What's this one then?

I dunno. I've never gotten this far!

It looks very dry here...

And hot!



If I remember from class, this could cause a wildfire!

Let's get out of here!



EXIT

CLICK

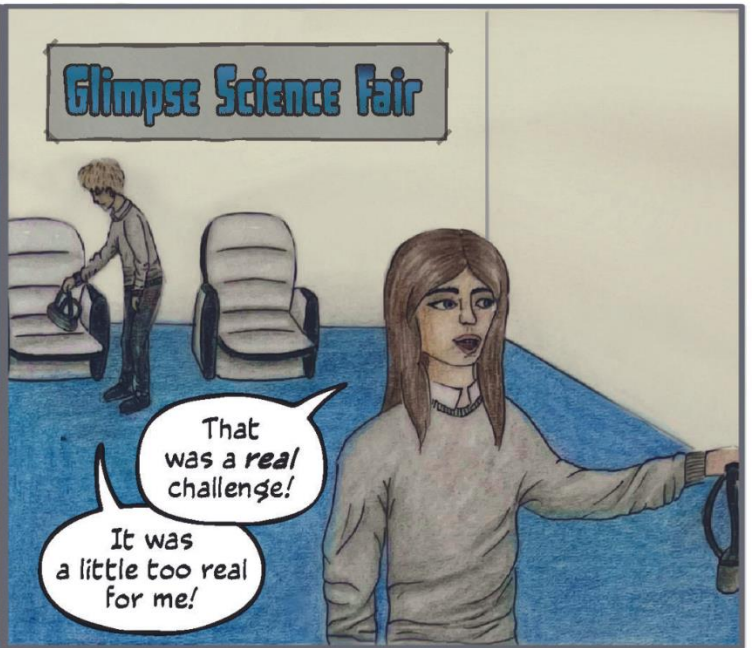






We made it!

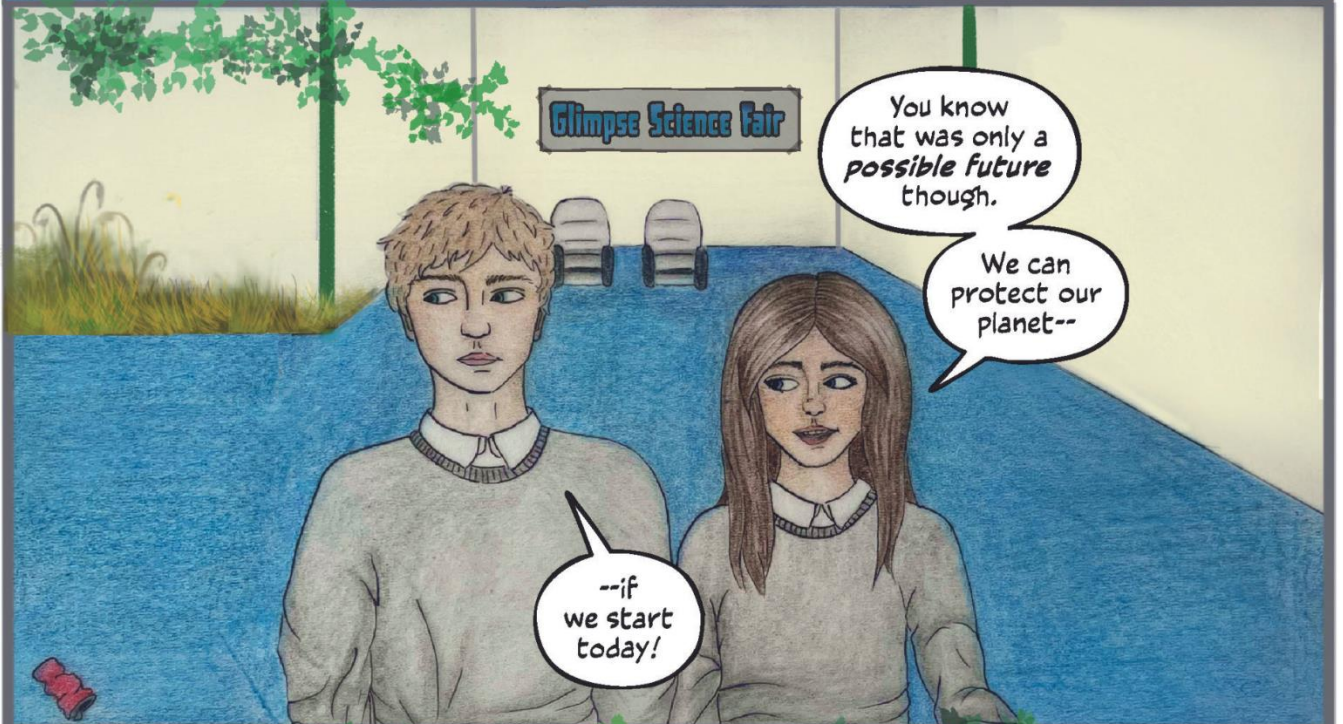
Just barely...let's not replay this one!



Glimpse Science Fair

That was a *real* challenge!

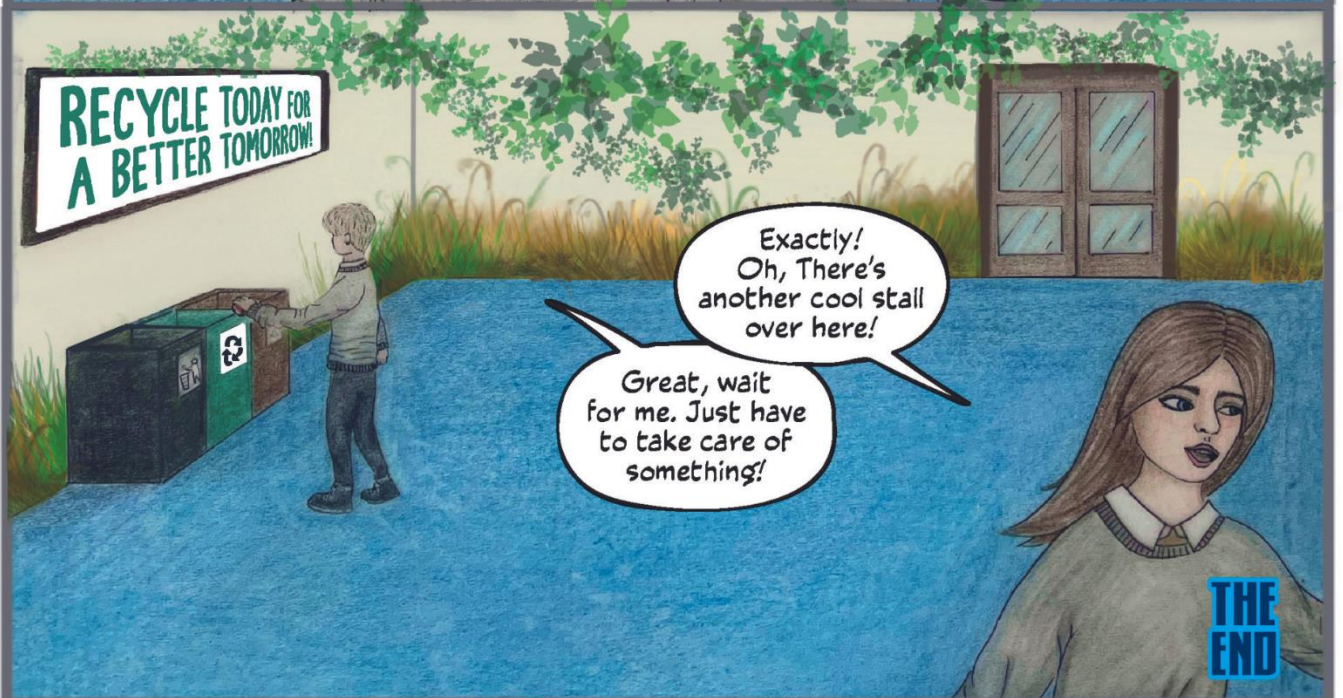
It was a little too real for me!



--if we start today!

You know that was only a *possible future* though.

We can protect our planet--



RECYCLE TODAY FOR A BETTER TOMORROW!

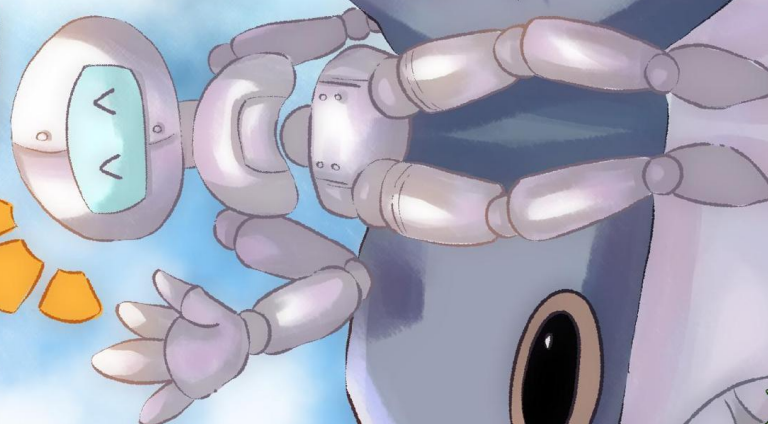
Great, wait for me. Just have to take care of something!

Exactly! Oh, There's another cool stall over here!

THE END



Bob



Wee



Alan

Charcoal



Maxine



Ben



**I**t's a bright summer's day at *Dublin Zoo* and Ms. Cheng's class are excited to go on their school tour...

Gather around everyone, today we're in *Dublin Zoo* to learn about *endangered species*.



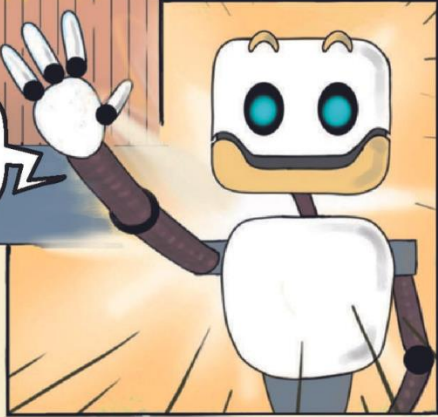
Without *protection*, these endangered animals may go *extinct* sometime in the near future.

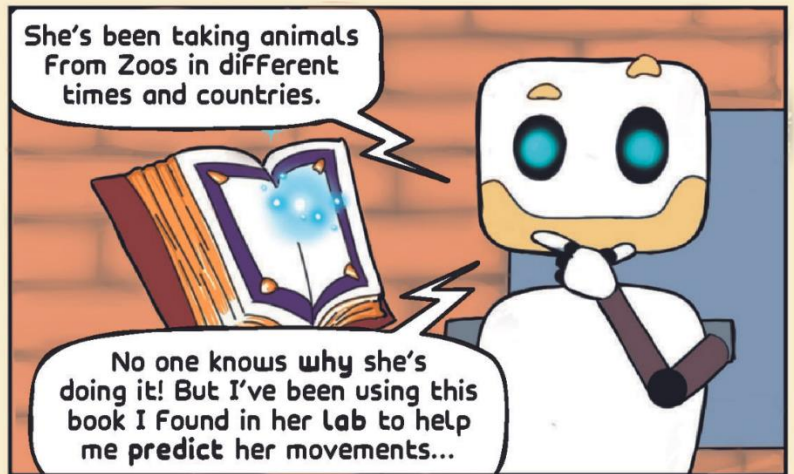
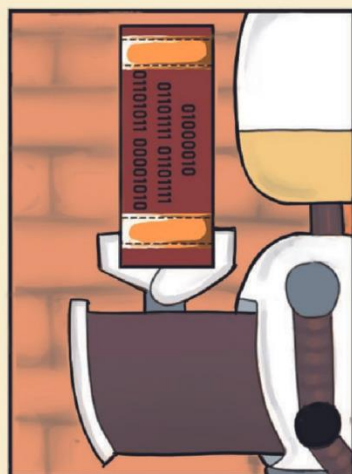
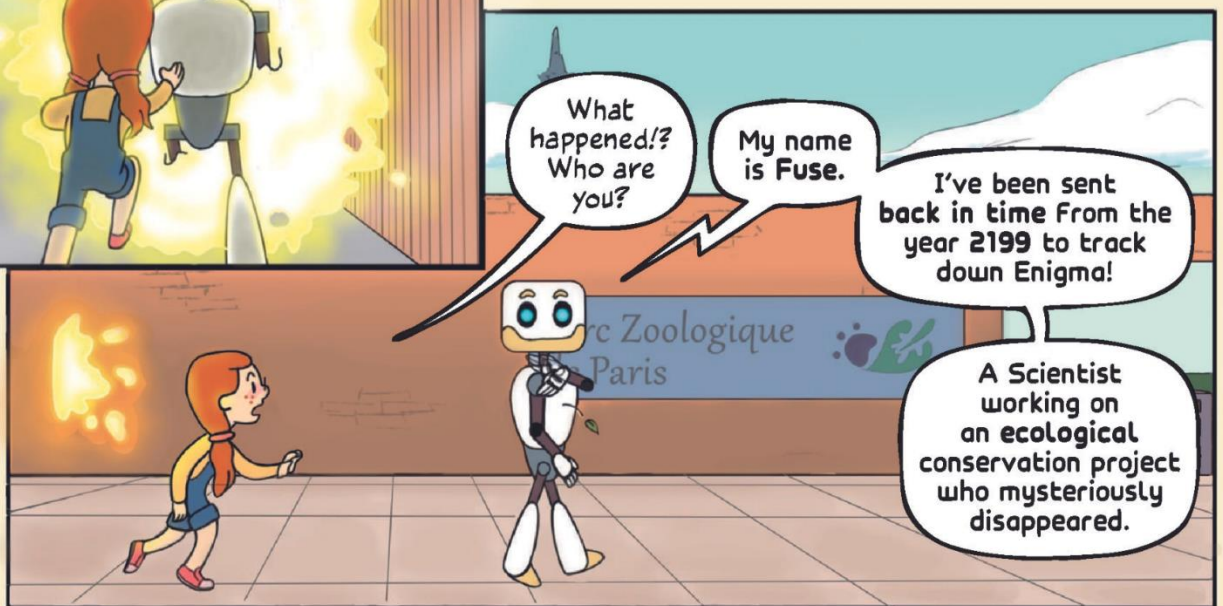
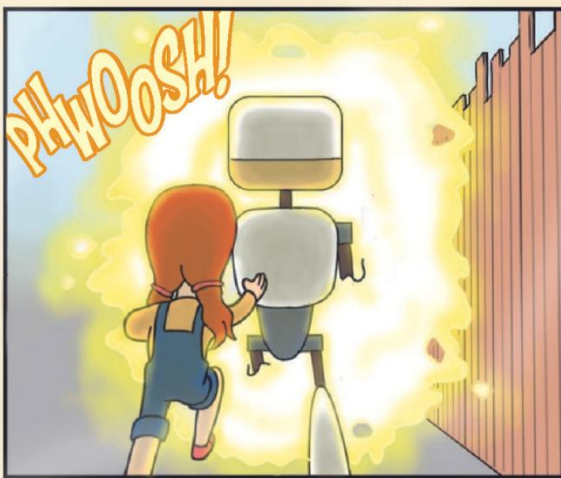
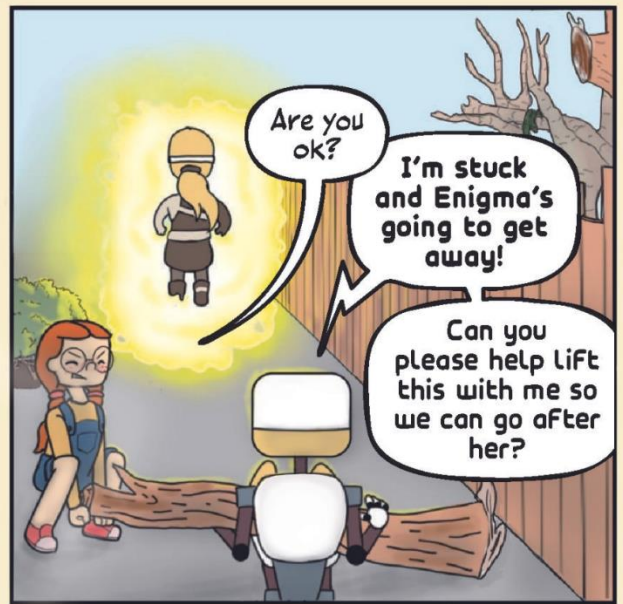


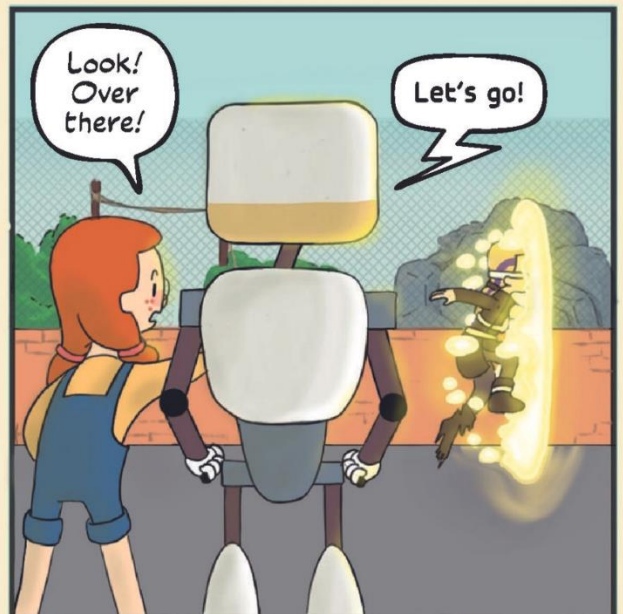
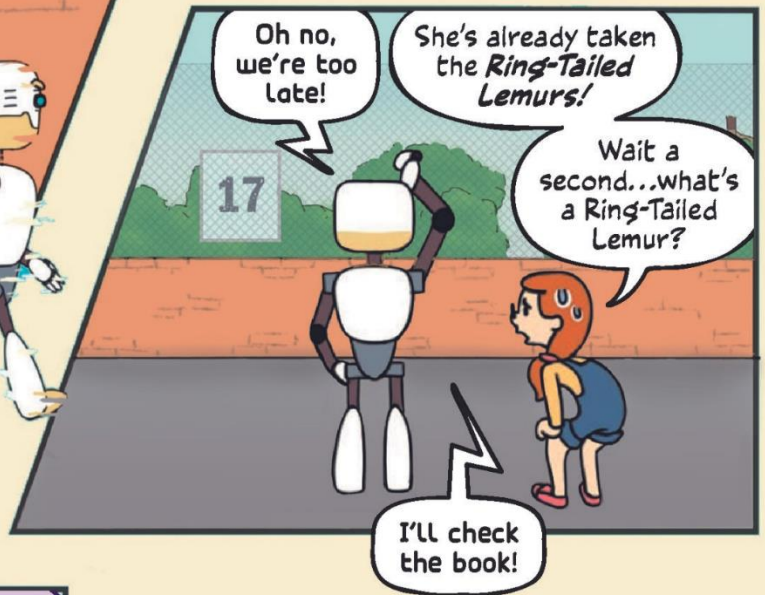
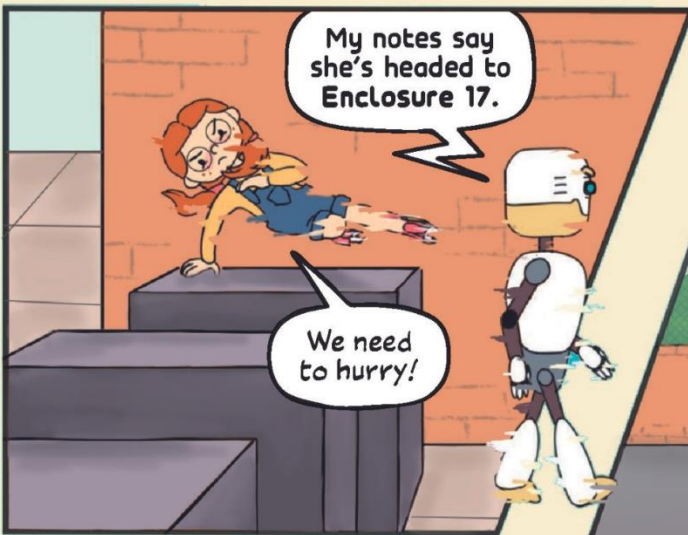
Make sure to *stay* with the group so you don't get lost...

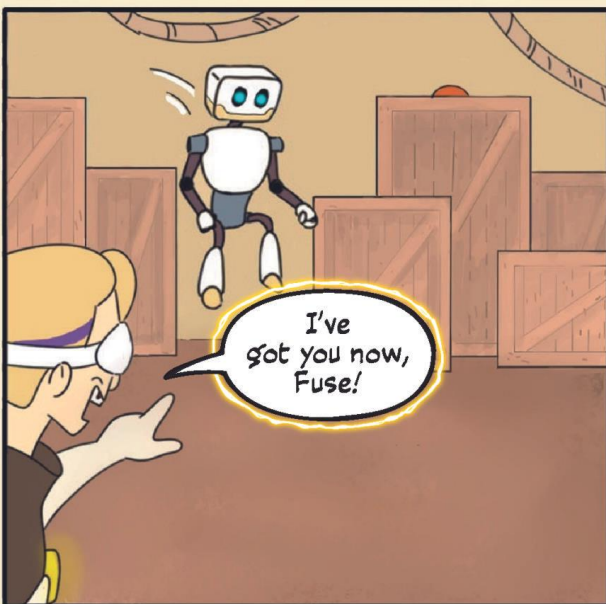
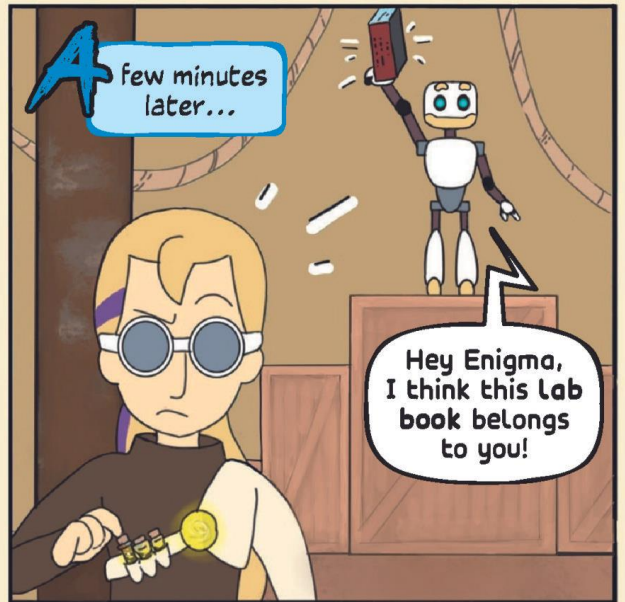
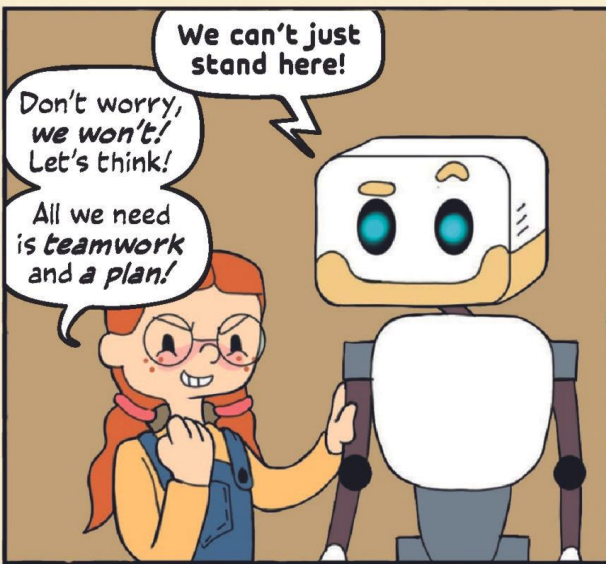
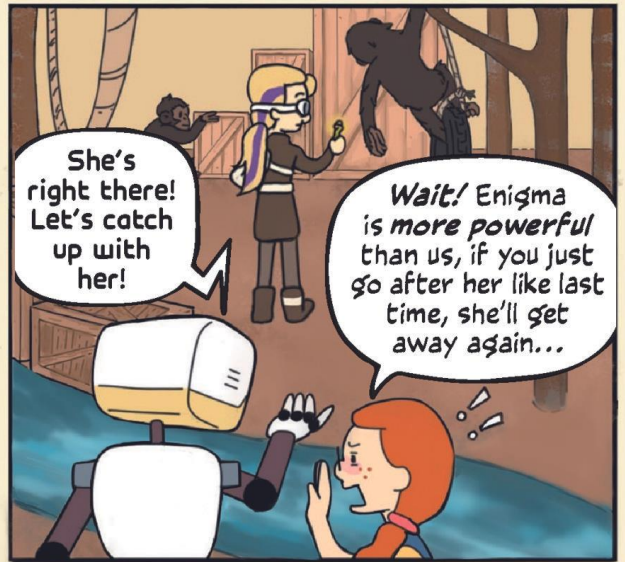
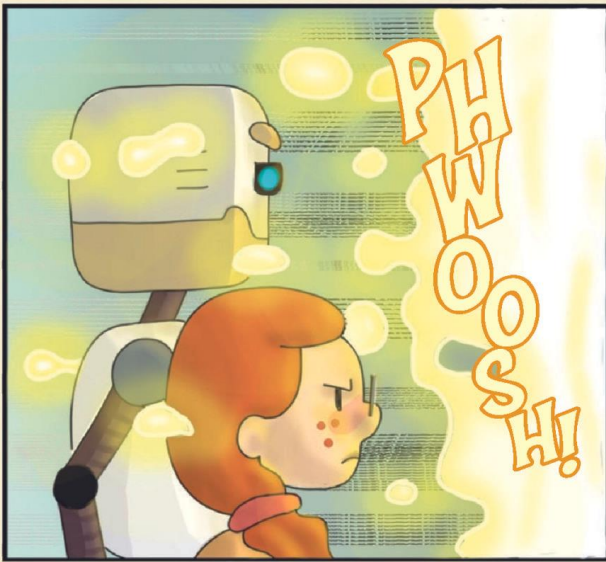


Stop right there, *Enigma*! I've Found you at last!











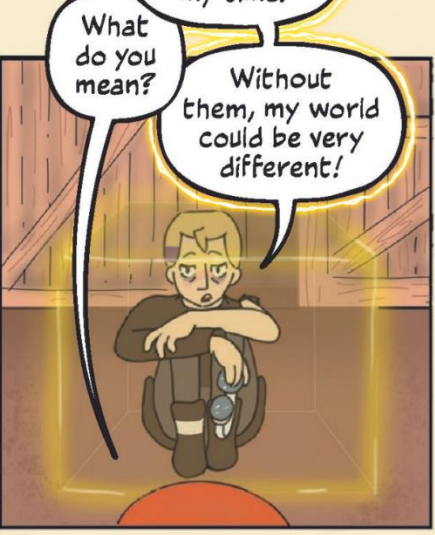
What the...?

Now gotcha! This is a very handy device!

PEW!

It's over, Enigma, give up and return all the animals back to the Zoo!

I can't do that...I need them to *save* my time!



What do you mean?

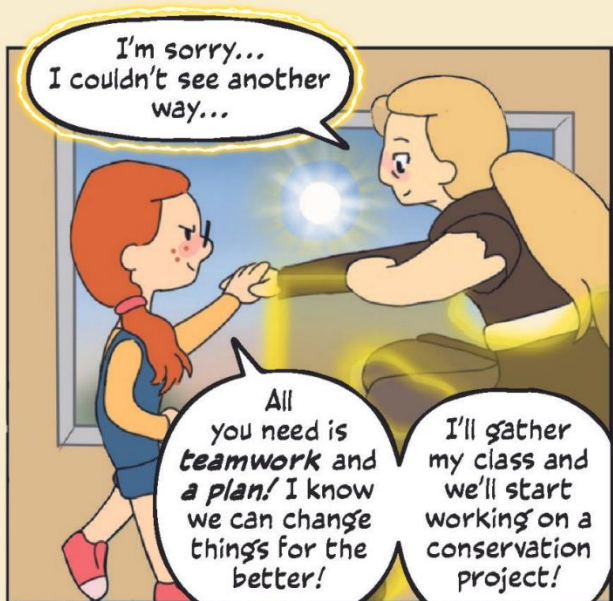
Without them, my world could be very different!



**The Year 2199.**

Many endangered species could become extinct if the environmental warnings are ignored!

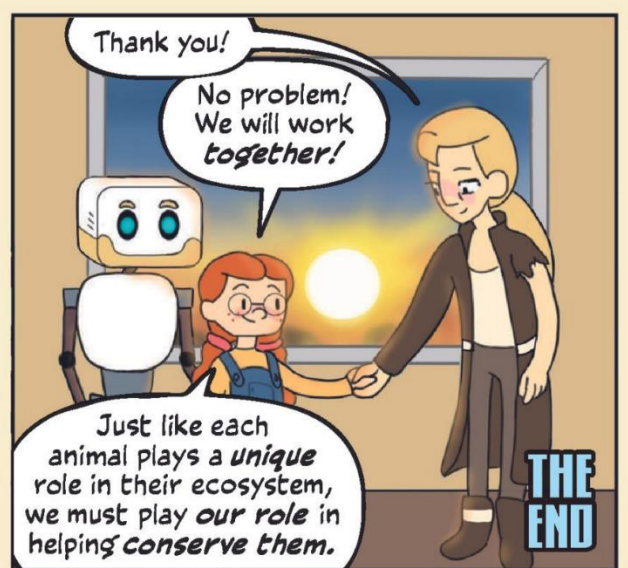
And without them to play their vital roles, many ecosystems may collapse!



I'm sorry... I couldn't see another way...

All you need is **teamwork** and **a plan!** I know we can change things for the better!

I'll gather my class and we'll start working on a conservation project!

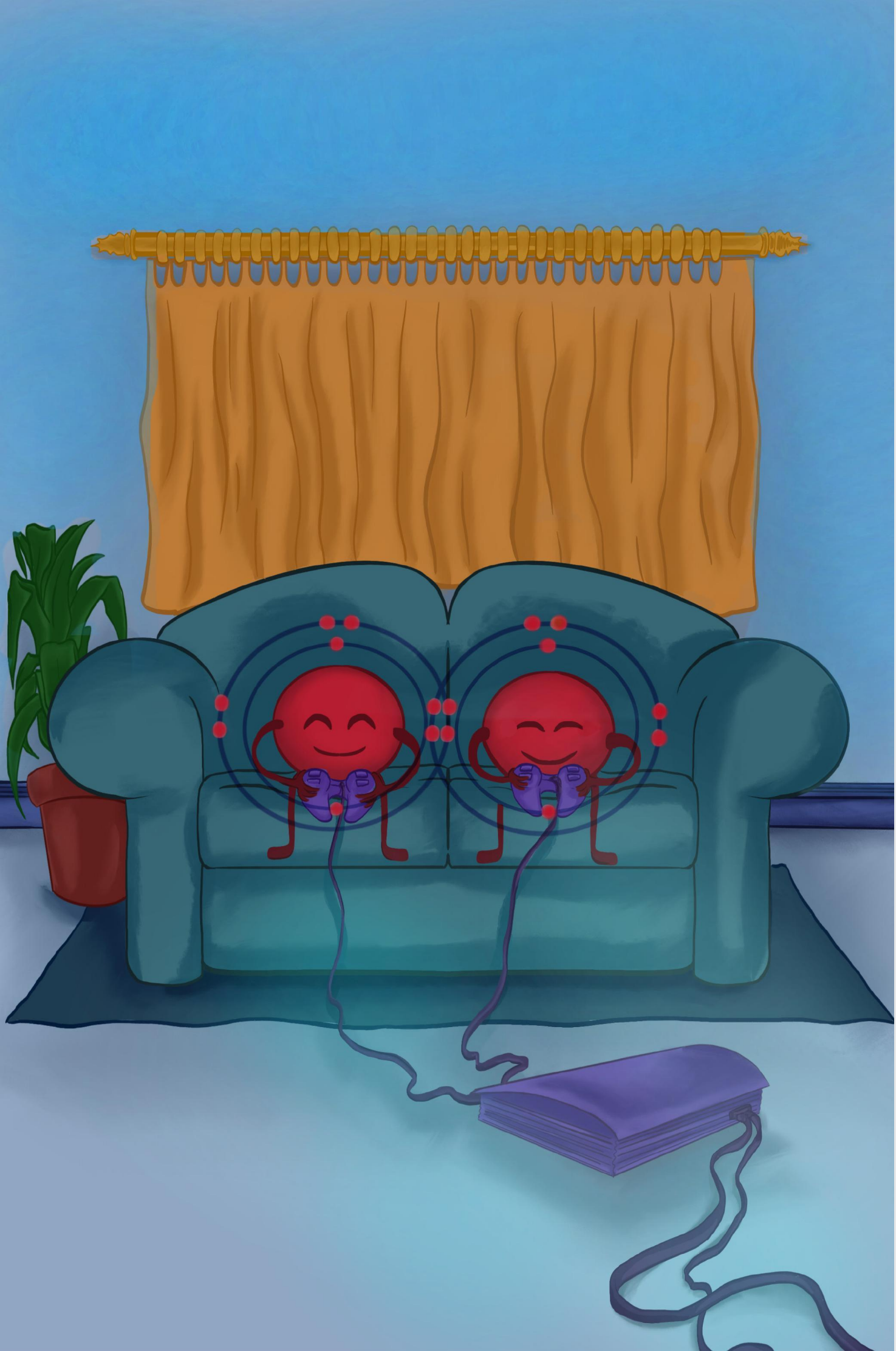


Thank you!

No problem! We will work together!

Just like each animal plays a **unique** role in their ecosystem, we must play **our role** in helping **conserve** them.

**THE END**

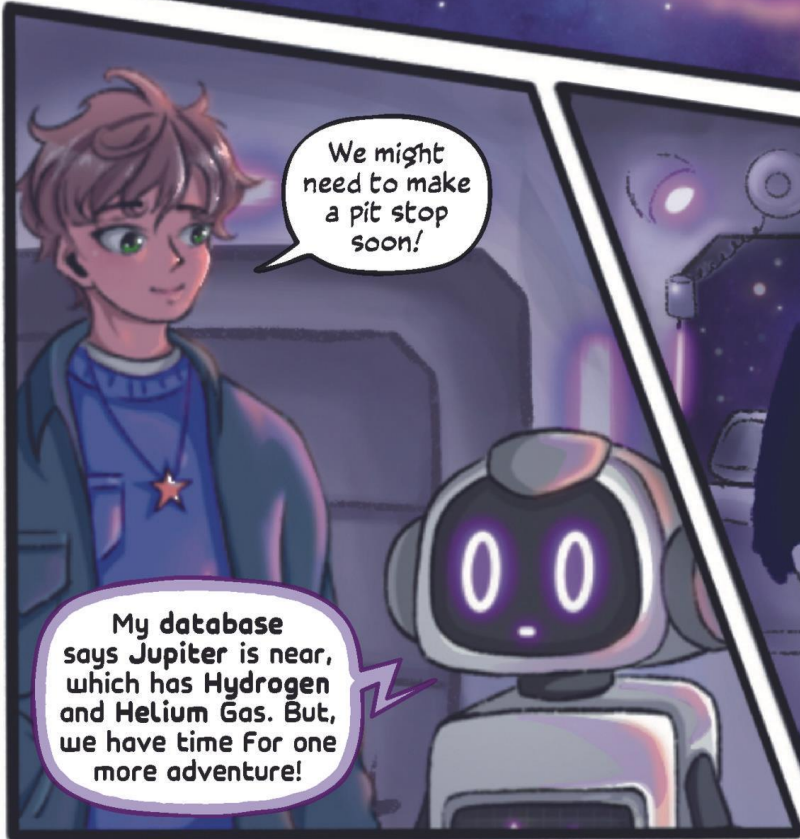






The year is 2265, in the Milky Way Galaxy. A spiral galaxy that formed approximately 14 billion years ago!

Emory and his robot friend, Astra, from the Planet Lessiria, are on a galactic adventure!



We might need to make a pit stop soon!

My database says Jupiter is near, which has Hydrogen and Helium Gas. But, we have time for one more adventure!



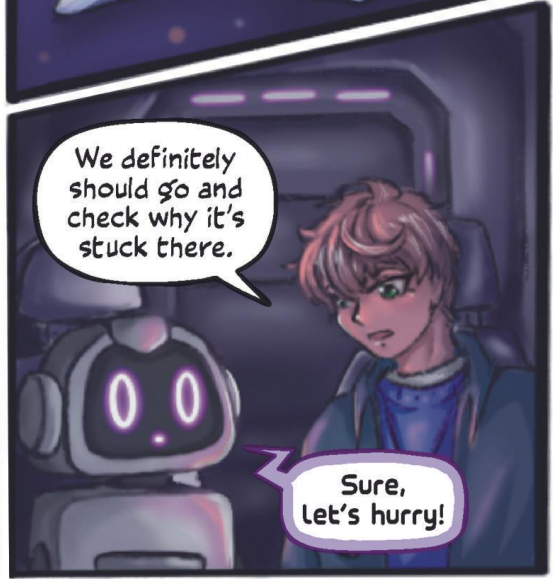
Your database memory system seems to be saving us a lot!

Well, your Father was the genius who created me.



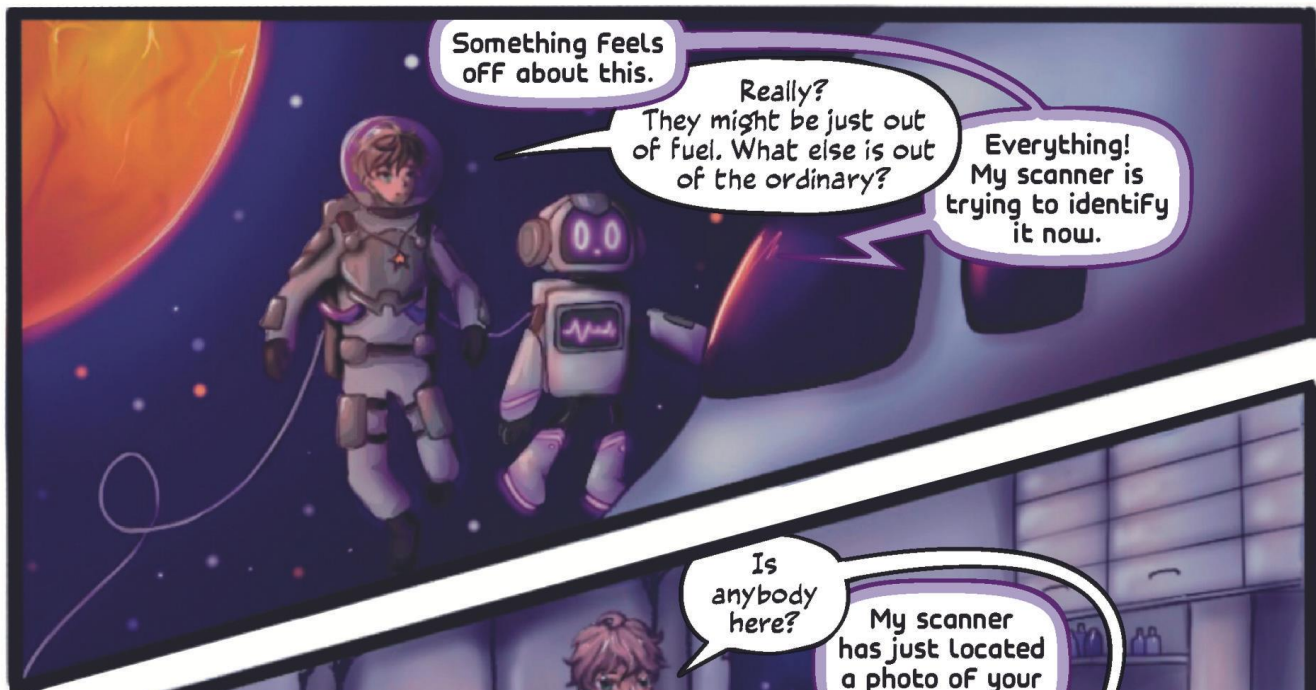
THOOM! ZRRZ!

Look! That ship looks like it's in trouble!



We definitely should go and check why it's stuck there.

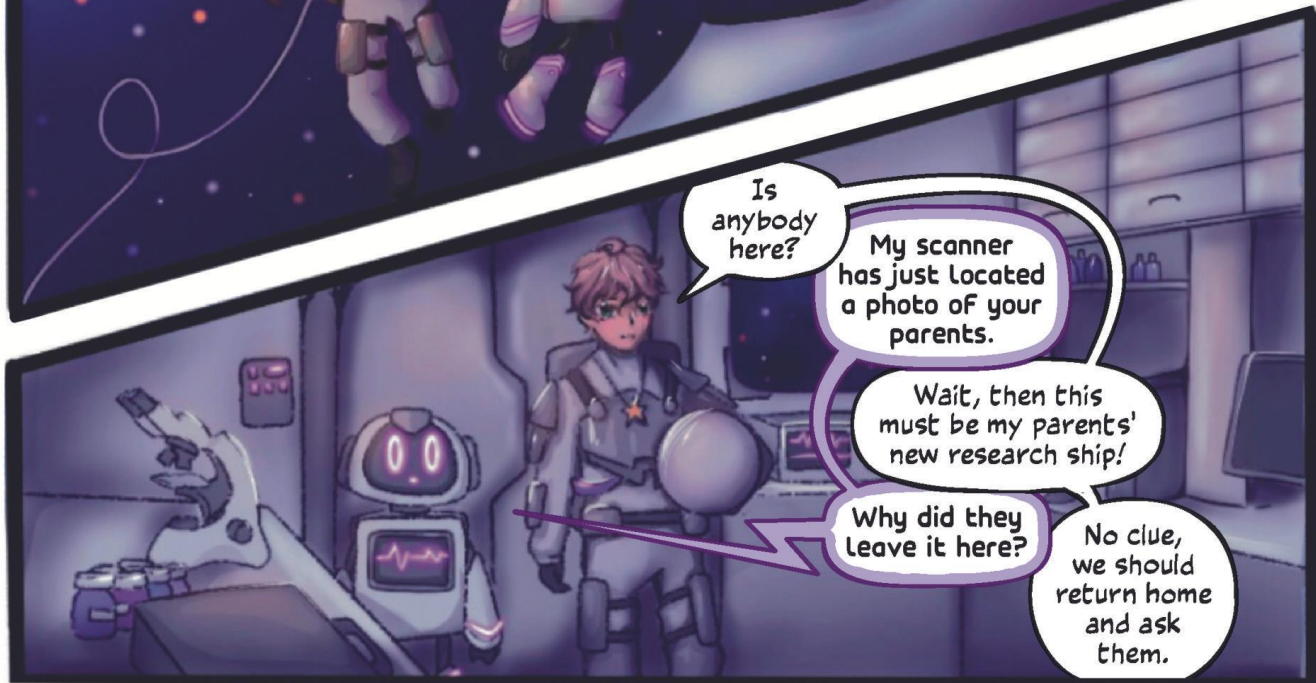
Sure, let's hurry!



Something feels off about this.

Really?  
They might be just out of fuel. What else is out of the ordinary?

Everything!  
My scanner is trying to identify it now.



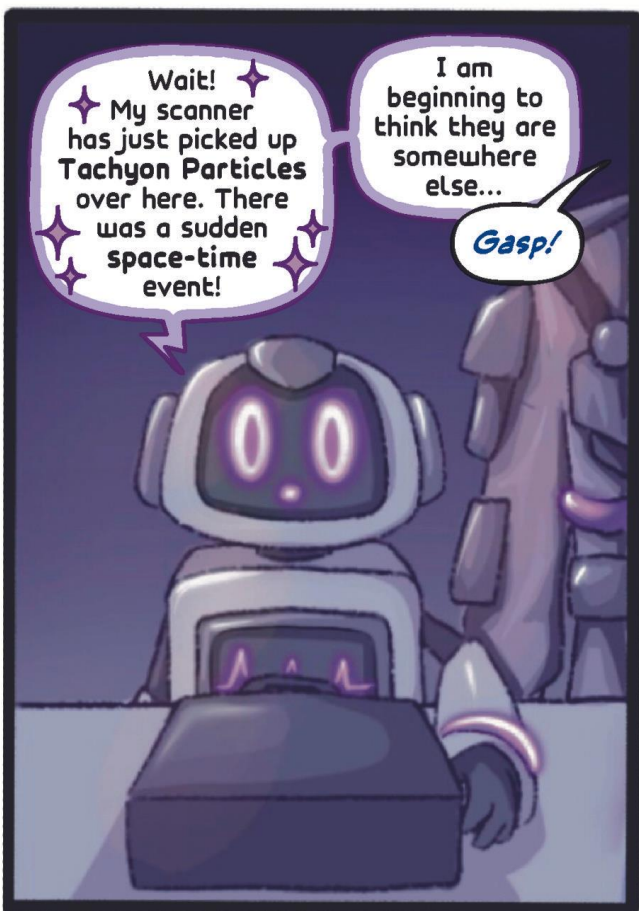
Is anybody here?

My scanner has just located a photo of your parents.

Wait, then this must be my parents' new research ship!

Why did they leave it here?

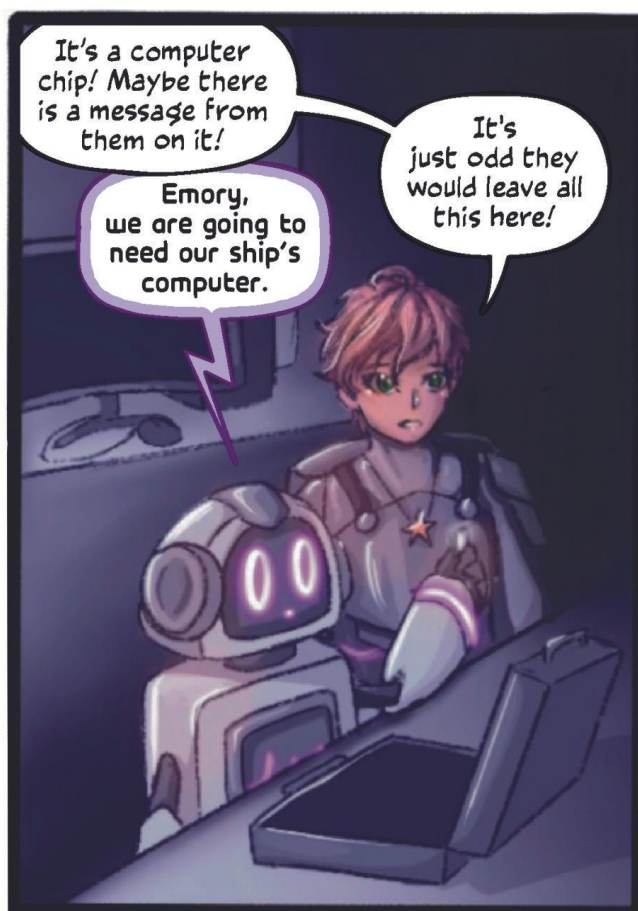
No clue, we should return home and ask them.



Wait! ✨  
My scanner has just picked up Tachyon Particles over here. There was a sudden space-time event! ✨

I am beginning to think they are somewhere else...

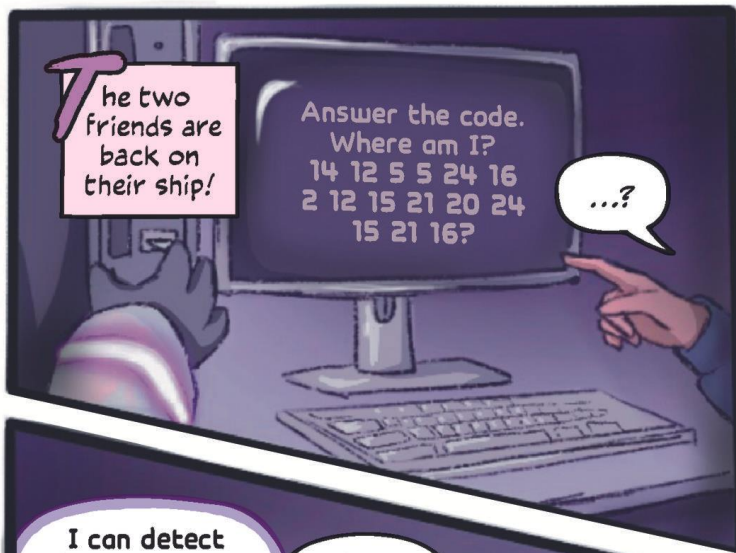
*Gasp!*



It's a computer chip! Maybe there is a message from them on it!

Emory, we are going to need our ship's computer.

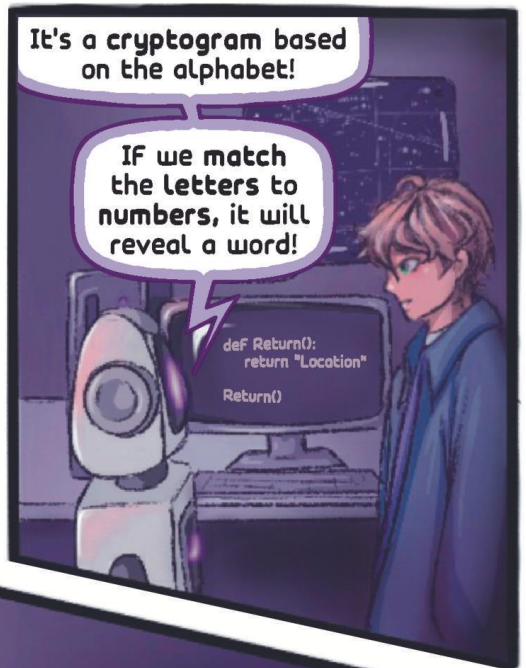
It's just odd they would leave all this here!



The two friends are back on their ship!

Answer the code.  
Where am I?  
14 12 5 5 24 16  
2 12 15 21 20 24  
15 21 16?

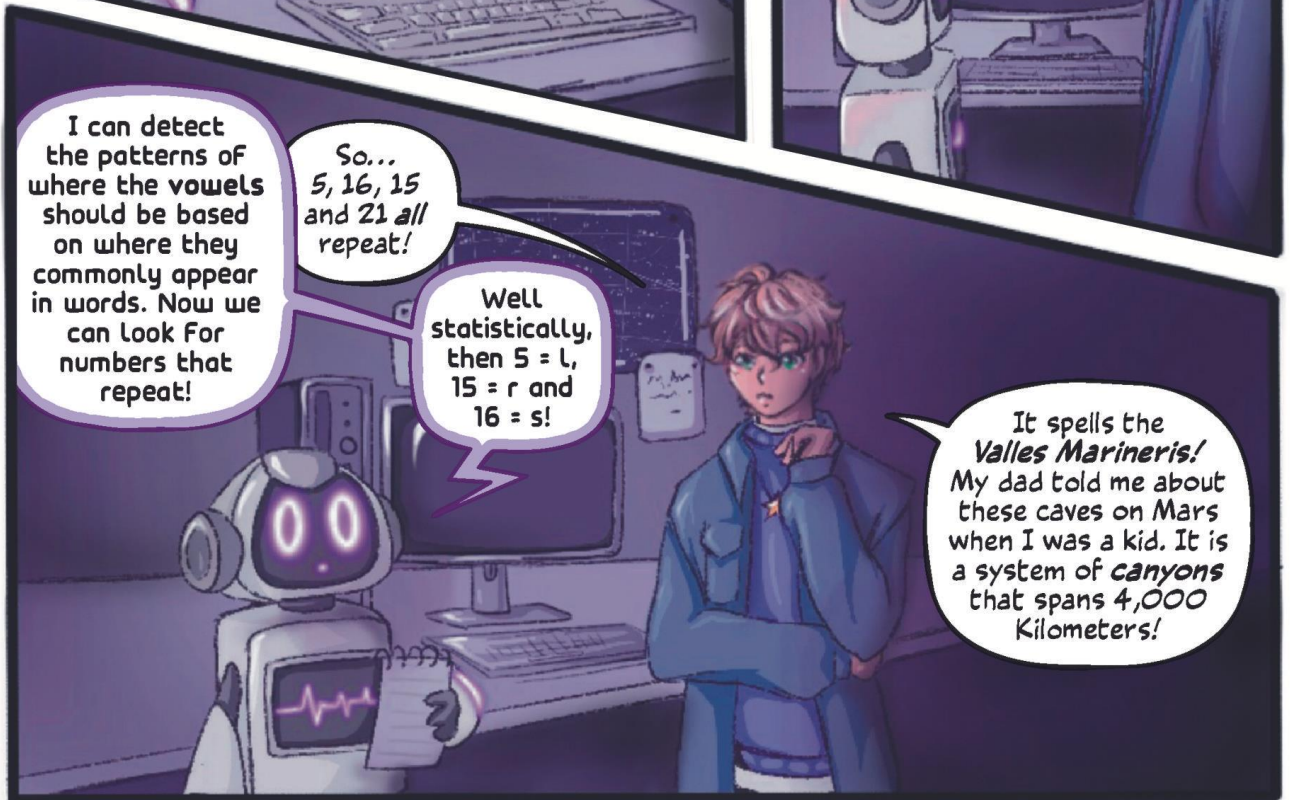
...?



It's a cryptogram based on the alphabet!

IF we match the letters to numbers, it will reveal a word!

```
def Return():  
    return "Location"  
Return()
```

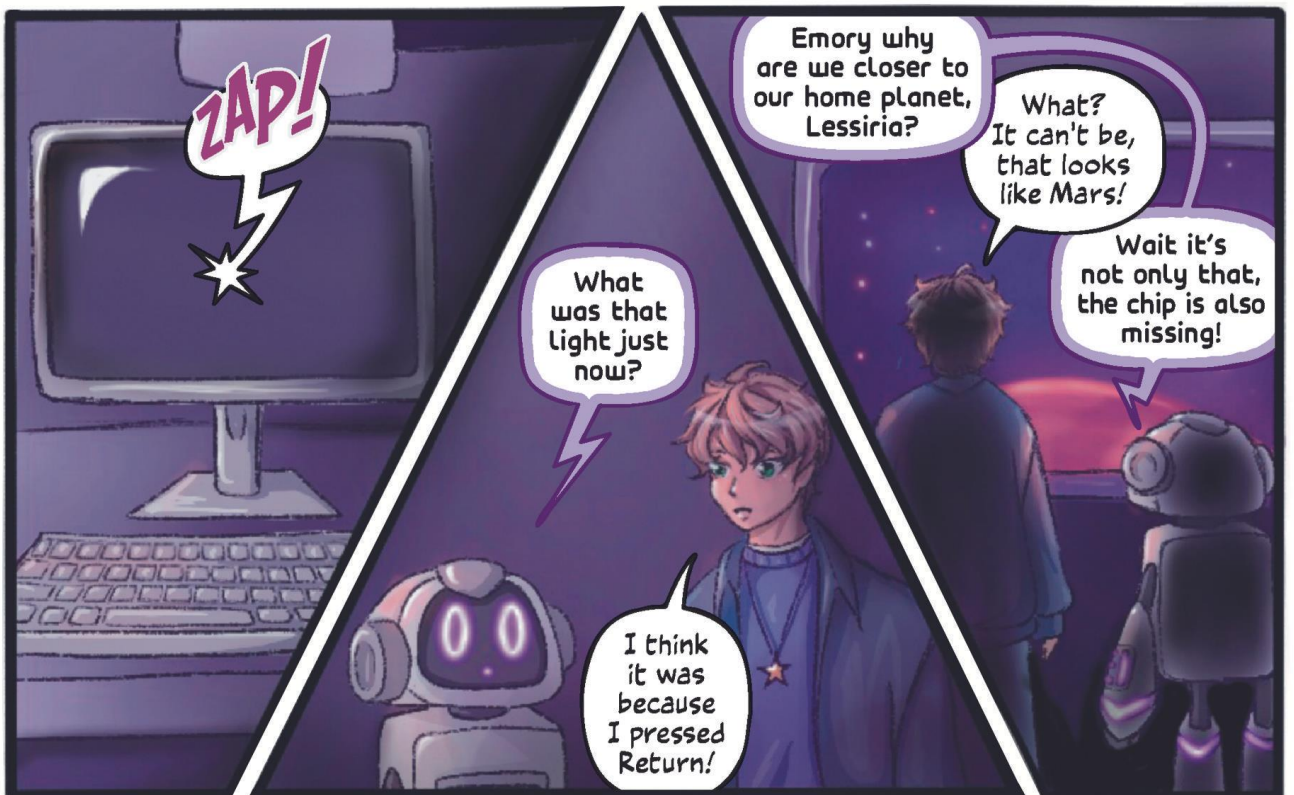


I can detect the patterns of where the vowels should be based on where they commonly appear in words. Now we can look for numbers that repeat!

So... 5, 16, 15 and 21 all repeat!

Well statistically, then 5 = l, 15 = r and 16 = s!

It spells the *Valles Marineris!* My dad told me about these caves on Mars when I was a kid. It is a system of *canyons* that spans 4,000 Kilometers!



ZAP!

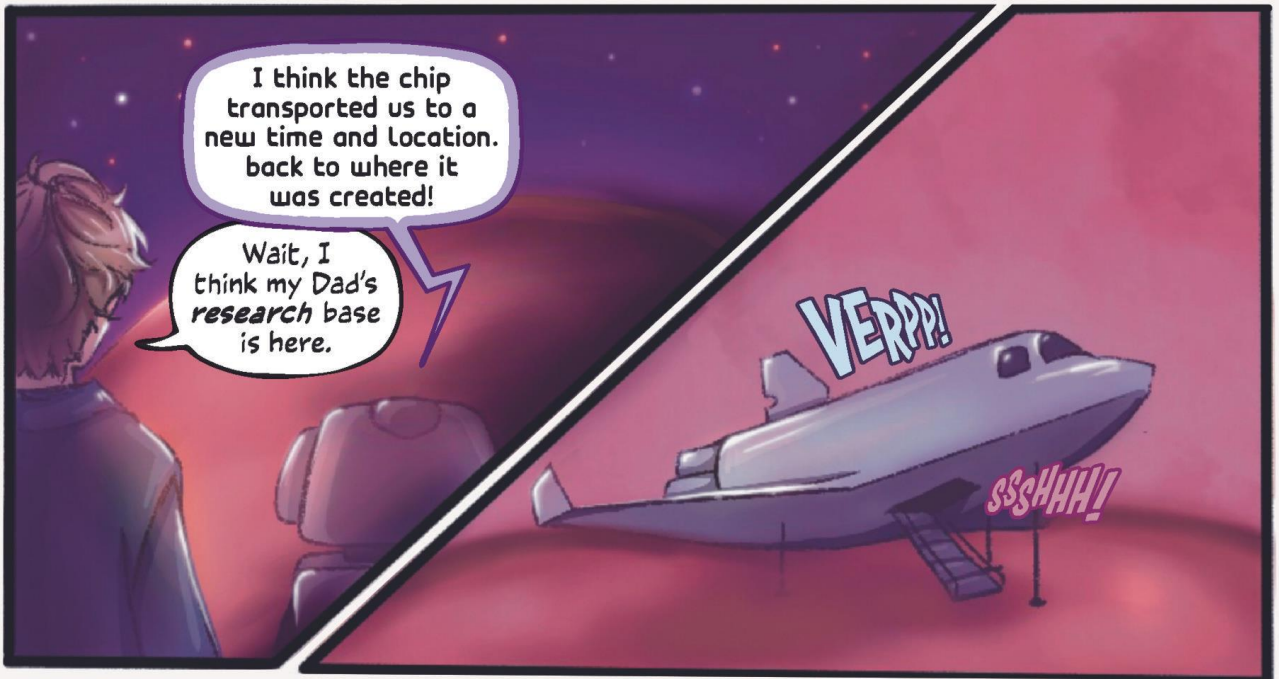
Emory why are we closer to our home planet, Lessiria?

What? It can't be, that looks like Mars!

Wait it's not only that, the chip is also missing!

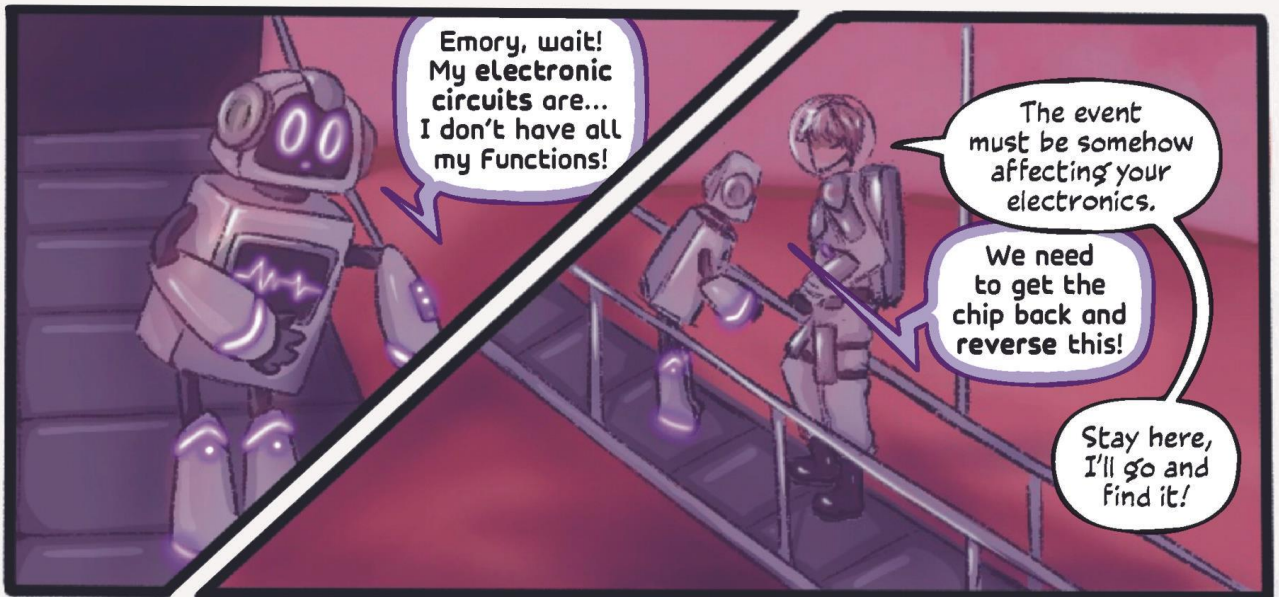
What was that light just now?

I think it was because I pressed Return!



I think the chip transported us to a new time and location. back to where it was created!

Wait, I think my Dad's *research* base is here.

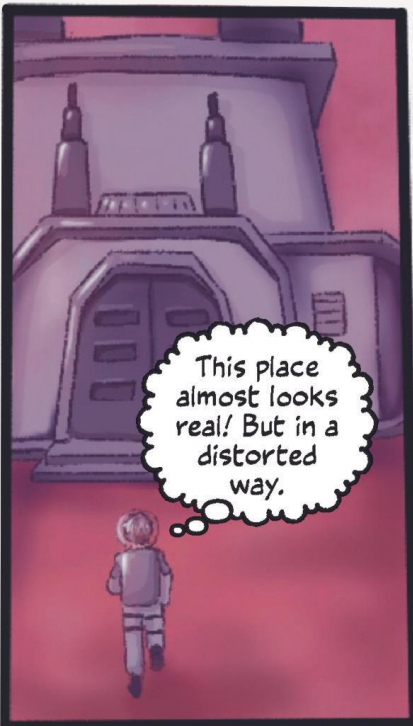


Emory, wait! My electronic circuits are... I don't have all my Functions!

The event must be somehow affecting your electronics.

We need to get the chip back and reverse this!

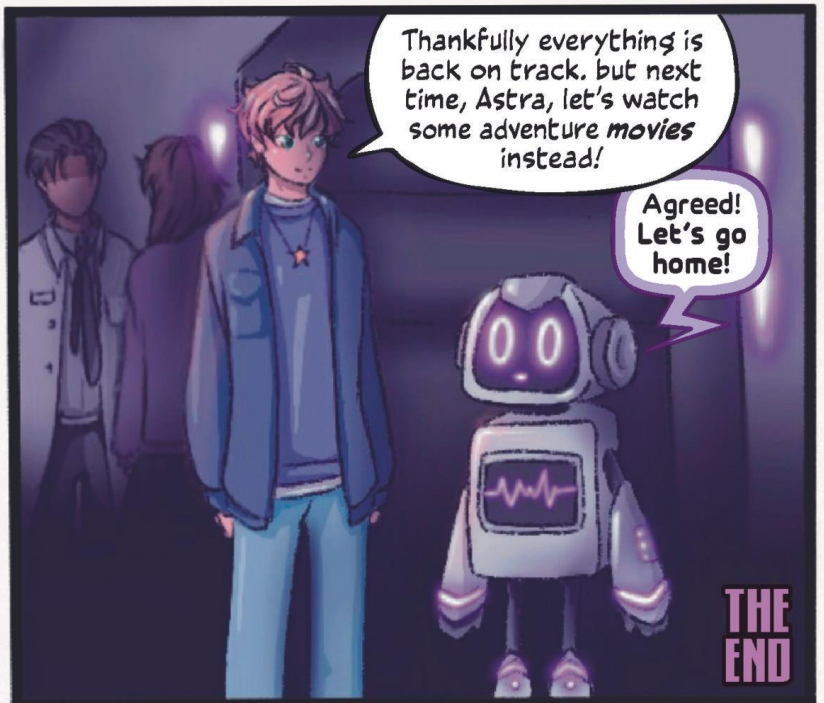
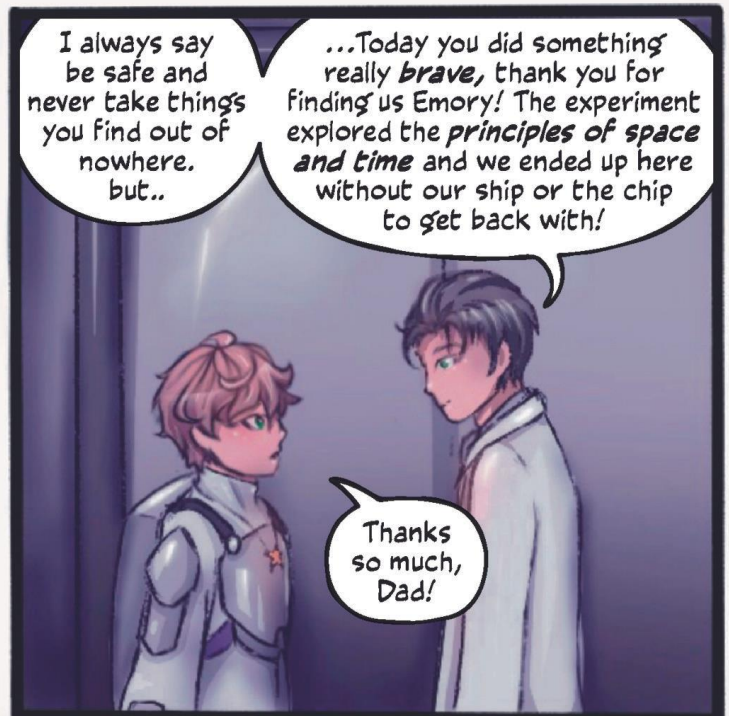
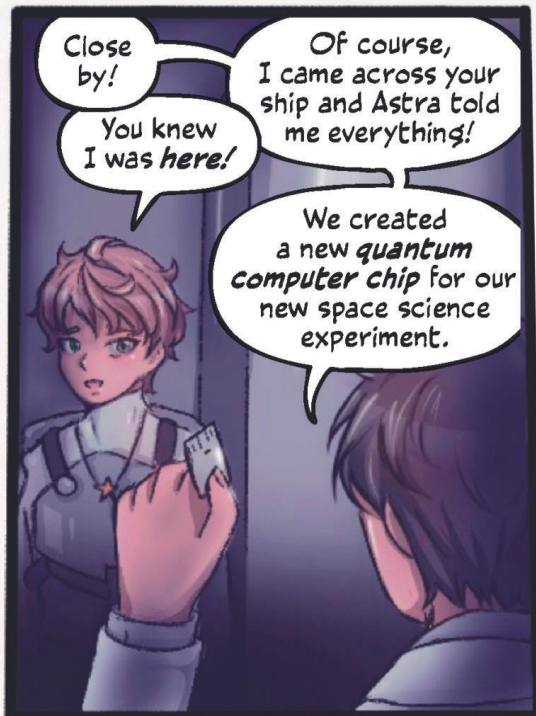
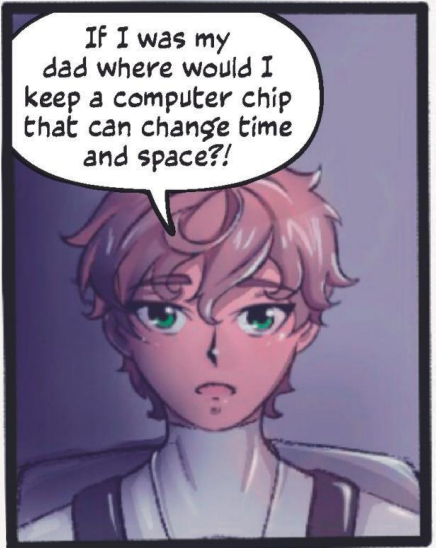
Stay here, I'll go and find it!

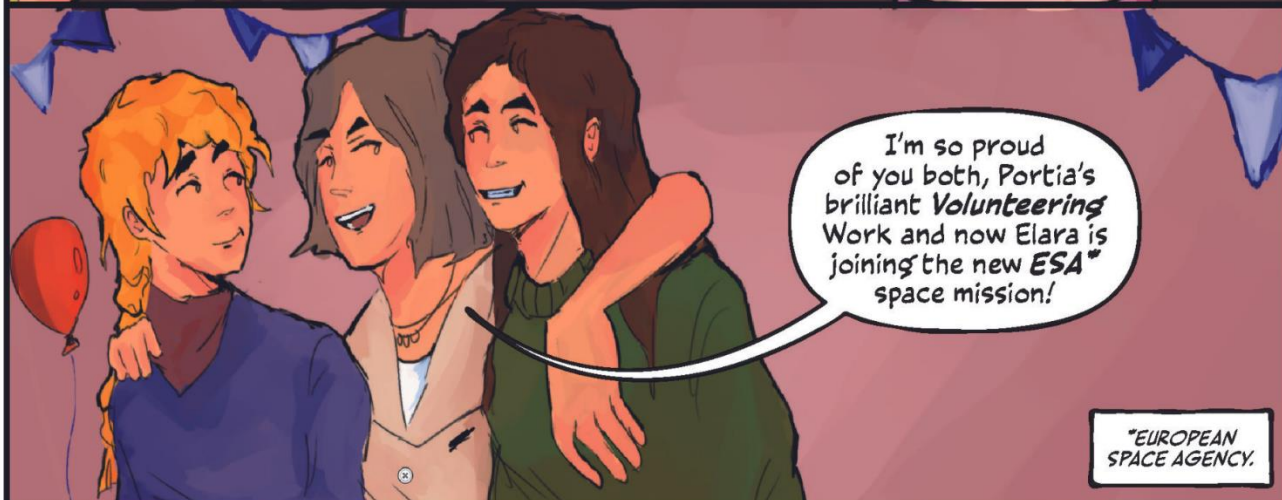


This place almost looks real! But in a distorted way.



Finally, here at *last!*







But our plan is to explore *Exoplanets!*

*Exoplanets!?*



This is a planet that isn't in our solar system, so it doesn't orbit the sun. Most of these exoplanets orbit other stars but some are free-floating called *Rogue Exoplanets*.

We will try to find some of these but we will be looking mostly for *Exoplanets* that are found in the *habitable zone!*

What's the *habitable zone?*

It's an area around a star where it is *not too hot and not too cold* for liquid water to exist on the surface of surrounding planets! Sometimes it's called the *Goldilocks zone!*



Wow! I'm going to miss these chats!



Good luck, you better be back for our big *30th Birthday Party!*

I wouldn't miss it for the world!



Main engine Start, T-minus 6, 5, 4, 3, 2, 1, Ignition!

All engines running! Lift-off! We have a lift-off!

**E**ight years later!


An astronaut in a white space suit with a rainbow stripe on the helmet is sitting in the cockpit of a spacecraft. The Earth is visible through the window. A calendar on the wall shows the date 1/15. The astronaut is holding the controls.

Today's the day we finally arrive back on Earth! We have made so many discoveries but I can't wait to see my family!

An astronaut in a white space suit is running across a green field towards a woman with long brown hair wearing a red shirt and blue pants. The astronaut has their arms outstretched. In the background, a white space shuttle is on the ground under a blue sky with white clouds.

EEEEPP!

I'm sooo happy to see you!! But I can't believe it's been fifteen years!!

A close-up of the astronaut and the woman. The woman is on the left, looking at the astronaut. The astronaut is on the right, looking surprised.

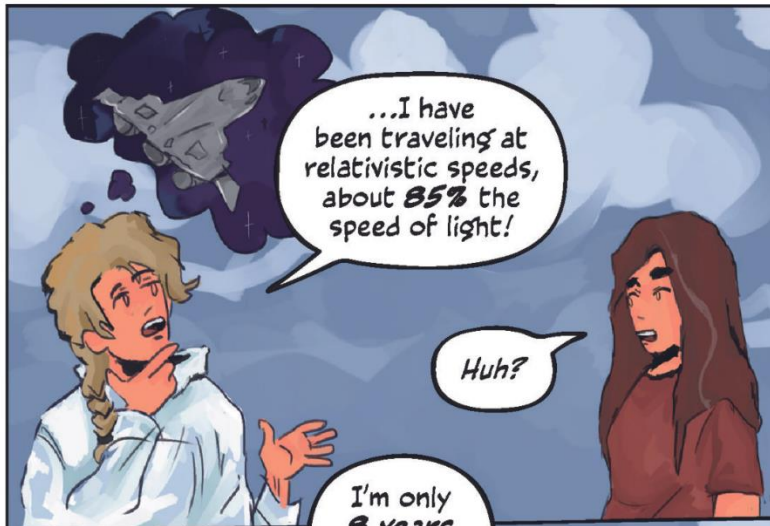
But I'm only 28!

...?!

I'm 35 years old now and you missed our 30th Birthday party!

Oh no, I forgot about *Relativity*!!





...I have been traveling at relativistic speeds, about 85% the speed of light!

Huh?

I'm only 8 years older than when I left.

But I'm 15 years older!



The Theory of Relativity says time is measured differently for moving objects than for stationary ones, this is called *time dilation!*

Wait... are we in a Paradox?



An observer on Earth (**Portia**) would calculate that if a Spacecraft was traveling away from the Earth at relativistic speeds, it would experience time dilation. Therefore, time would run more slowly on the spacecraft than on Earth!

So **Elara** would be younger than **Portia**!

But an observer on the Spacecraft (**Elara**) would be in her own inertial reference frame. So she would calculate it as if the Earth was traveling away from her at relativistic speeds and would consider herself to be standing still! From this point of view, the Earth would experience time dilation. Meaning, time would run more slowly on Earth than on the Spacecraft!

So **Portia** would be younger than **Elara**.

Which one is correct?

Wait! But when I was traveling in the Spacecraft, I changed direction to return back to Earth, therefore I changed *inertial reference frames!*

So that must mean...

Exactly! For an object to be defined as being in an inertial frame of reference, it must remain at rest or uniform motion.

So that's why I'm 28! So it's not really a paradox. It's just that I changed reference frame!

Wow! We must be the first-ever twins that are of such *different ages!*

You're right! That's pretty awesome!

You know... I think they should call it a *'Twin Paradox'!*

Wait a minute, if we're a Paradox now, are we still Twins?

*Of course!* There's no *Force* in the *Universe* that could undo that... *Big sis!*

Ha ha ha!

THE END



Rialtas na hÉireann  
Government of Ireland



An Roinn Oideachais  
Department of Education



This Project was **only** made Possible with the Collaborations and Partnerships between all these Institutions and with the Support and Awards from Science Foundation Ireland and the Department of Education Ireland.



The creative team would like to sincerely thank all those who facilitated the realisation of our comic book. It has been a very exciting journey for us all and we are grateful to have made many new friends along the way!

Yours truly,

Team Harmonic

