

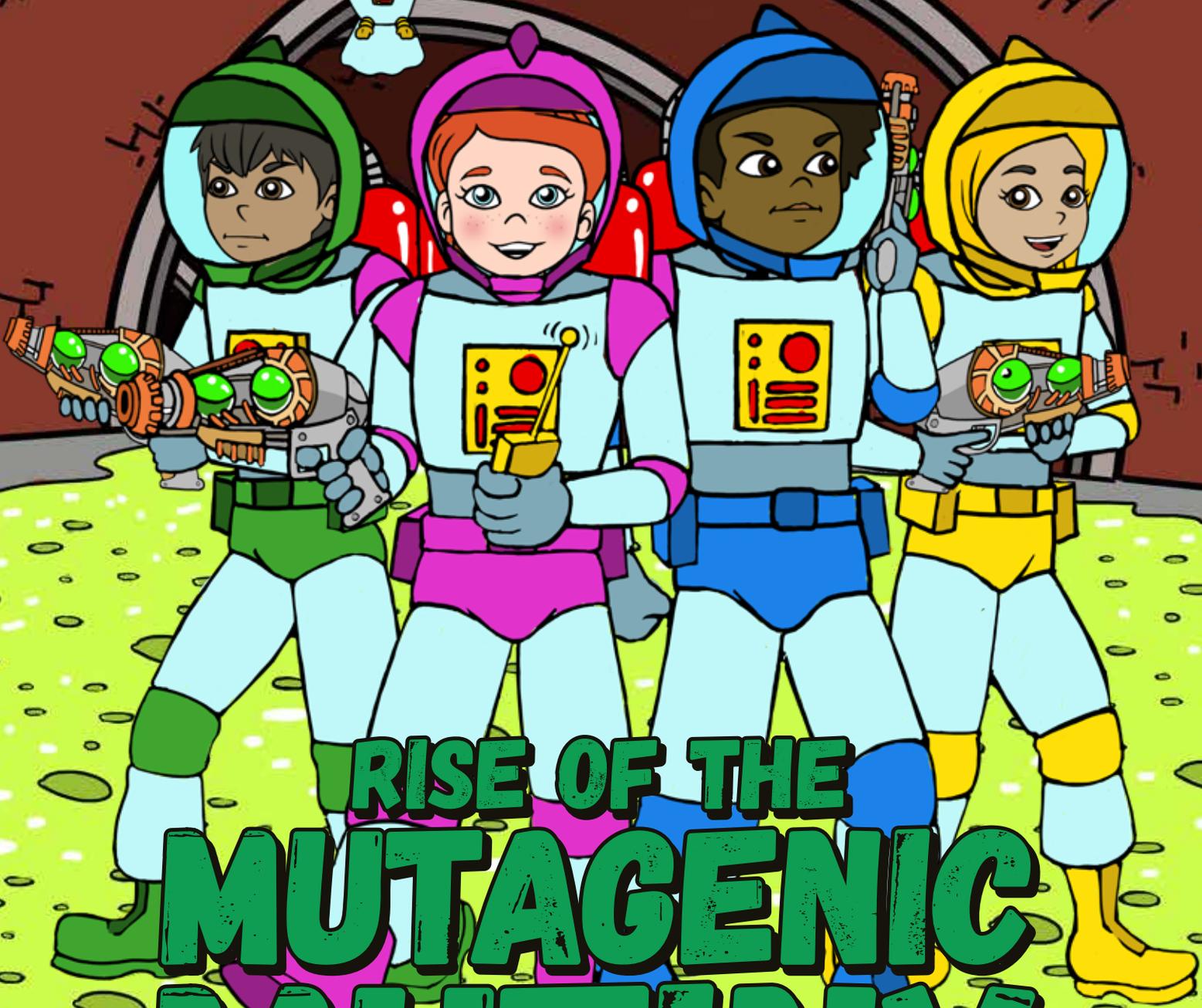
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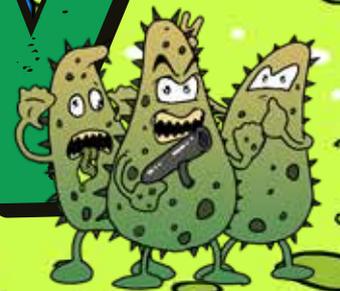
ANNIE

& MAC'S ADVENTURES

ANNIE & MAC'S ADVENTURES IS
A PUBLICATION FROM UPPSALA
MONITORING CENTRE



RISE OF THE MUTAGENIC MUTINY



TEAM SAFE MEDS



ISAAC

WANTS TO BE A SCIENTIST, JUST LIKE HIS MUM. A SKILLED BASKETBALL PLAYER (WITH A SECRET PASSION FOR KNITTING). ANNIE'S FRIEND SINCE KINDERGARTEN.

ANNIE

OUR HEROINE. HELPS PEOPLE TO BE SAFE AROUND MEDICINES. ENJOYS BIKING, TV GAMES, READING, RUNNING, CLIMBING, SINGING, KNITTING, AND A GOOD CURRY. FAMILY: MUM, DAD, OLDER BROTHER. BEST FRIEND: MAC, HER PET HUMMINGBIRD.

AISHA

HAMAD'S TWIN SISTER. ELITE GYMNAST. HER DAD SAYS SHE HAS "A HEART OF GOLD, AND A WILL OF STEEL". PLAYS THE PIANO AND SPEAKS FIVE LANGUAGES.

MAC

SHORT FOR "MACH ONE". A HUMMINGBIRD. FAST FLYER. FAVOURITE HOBBY: INVENTING COOL MOVES TO KNOCK OUT BAD GUYS (SHOULD HE MEET ONE), SUCH AS "THE FEARFUL FLUTTER" AND "THE DIVE OF DEATH".

HAMAD

REGIONAL RUBIK'S CUBE CHAMPION SINCE HE WAS FOUR. ENJOYS "OUTDOOR ACTIVITIES" (IF THEY'RE ON TV). WISHES HE WAS A BIT TALLER.

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RISE OF THE MUTAGENIC MUTINY

A DARK THREAT IS RISING FROM THE SEWERS BENEATH THE CITY. TIME IS RUNNING OUT. WILL TEAM SAFE MEDS BE ABLE TO SAVE THE DAY?

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ANNIE'S MEDICINES SAFETY FACTS

GOOD BACTERIA – BAD BACTERIA
NOT ALL BACTERIA ARE BAD. IN FACT, OUR BODIES ARE HOME TO TRILLIONS OF BACTERIA THAT WE NEED TO SURVIVE!

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IRRESISTIBLE PUZZLES

ANTIBIOTIC RESISTANCE IS A TOUGH NUT TO CRACK! ARE YOU UP FOR THE CHALLENGE?

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ABOUT THE COMIC

THIS COMIC IS PRODUCED BY UPPSALA MONITORING CENTRE. READ MORE ABOUT US HERE!



RISE OF THE MUTAGENIC MUTINY



Hurry up, Annie!

Almost there!

Come on... Come on...



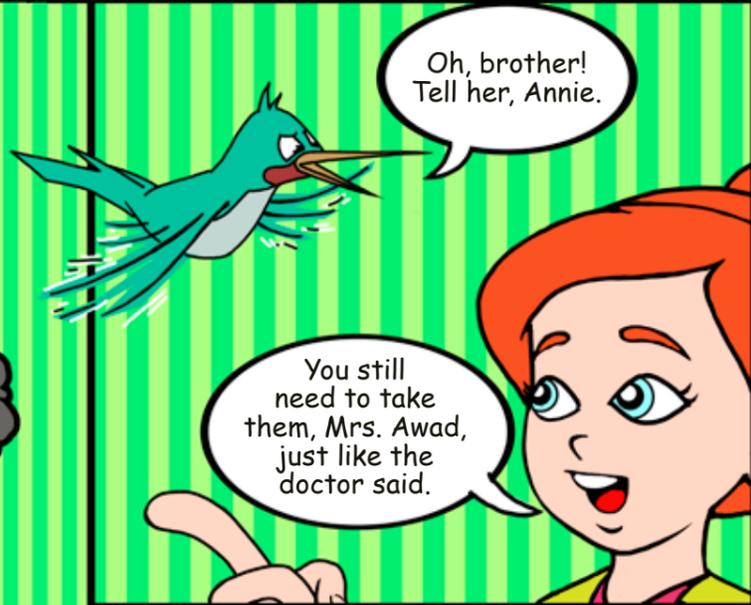
I just hope we're not too late.



FREEZE!

Please don't do it, Mrs. Awad!

PLOP!





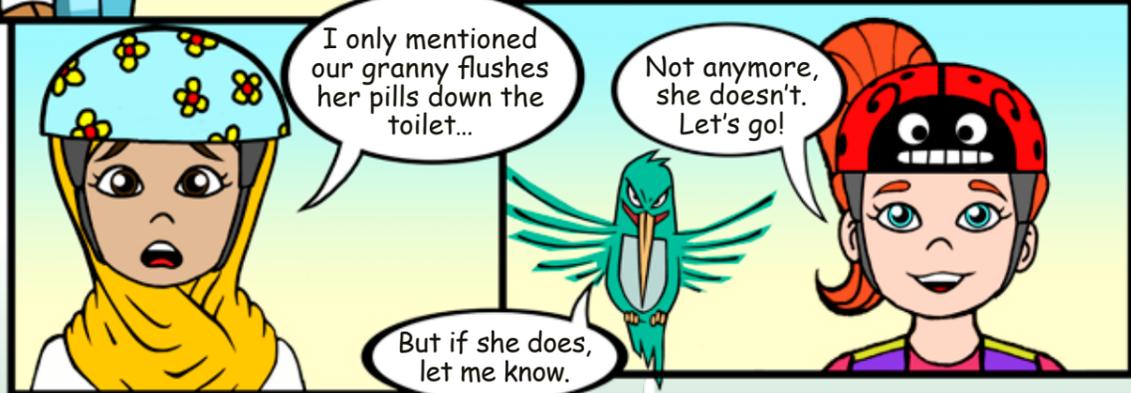
Okay, now your granny won't flush any more medicines down the toilet.



So, are we going to my house or not?



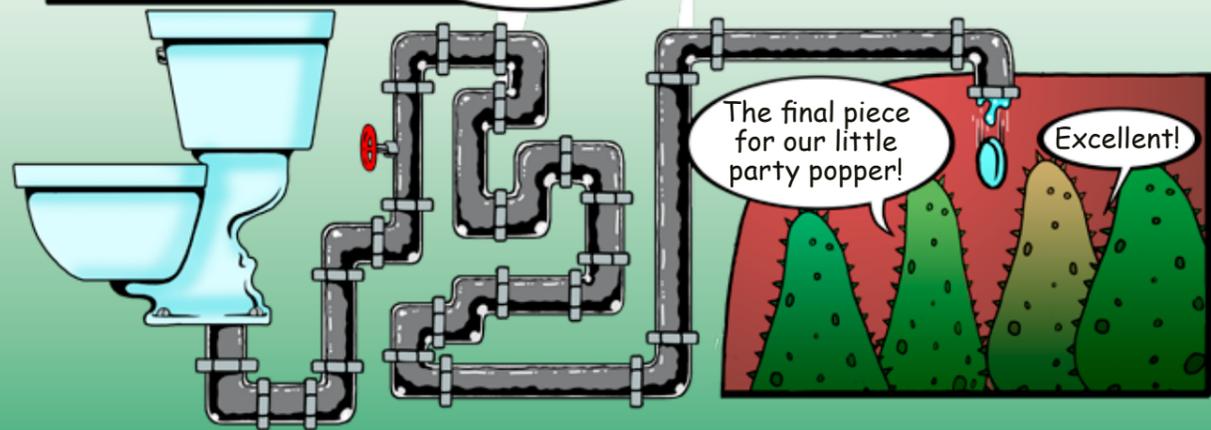
Sure, Isaac! Mac and I just had to take care of some business along the way.



I only mentioned our granny flushes her pills down the toilet...

Not anymore, she doesn't. Let's go!

But if she does, let me know.



The final piece for our little party popper!

Excellent!



Come on, Hamad!

Hey, watch out!



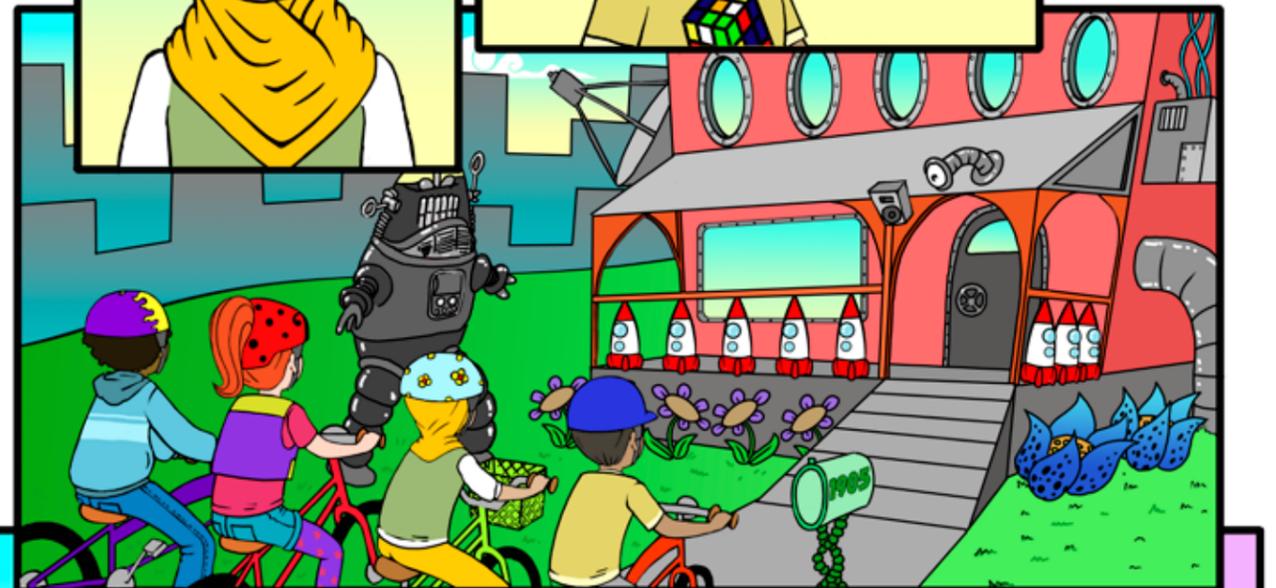
Oops, sorry!



When you're on a bike, everyone needs to wear a helmet.



Biking is not my thing, okay?



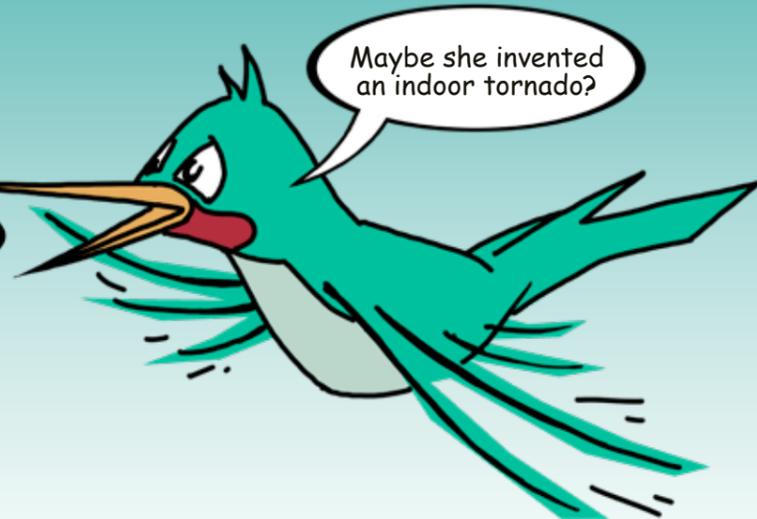
Mum! I'm home!



Mum?



What happened here?



Maybe she invented an indoor tornado?



Nah. She wouldn't do something that crazy. Twice...



Oops!

Watch it, Hamad!



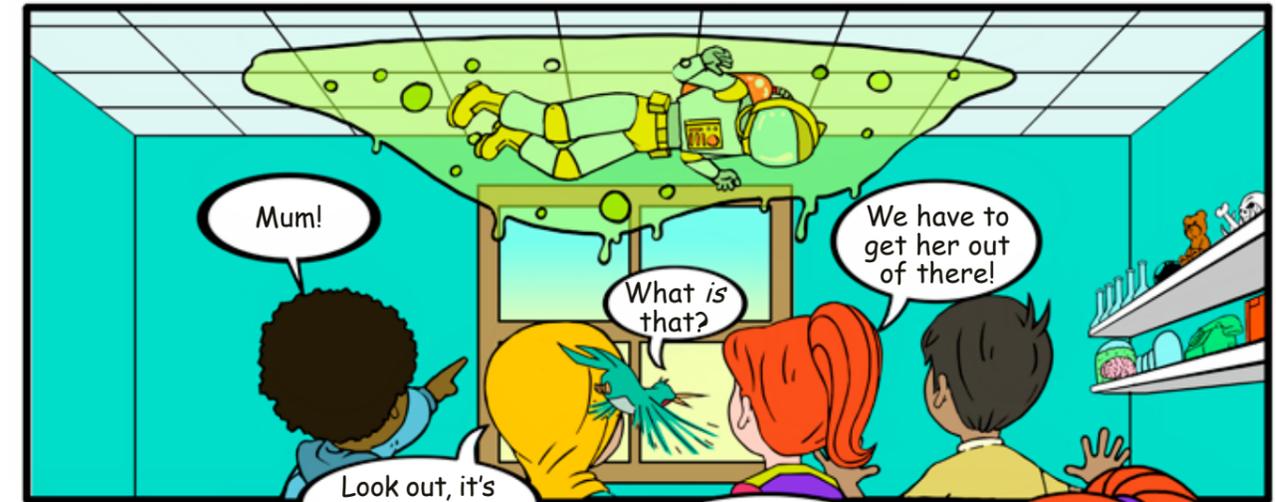
It wasn't my fault. The floor is slippery!

What's this?

Yuck...



Aah!



Mum!

We have to get her out of there!

What is that?

Look out, it's going to drop!



Yikes!

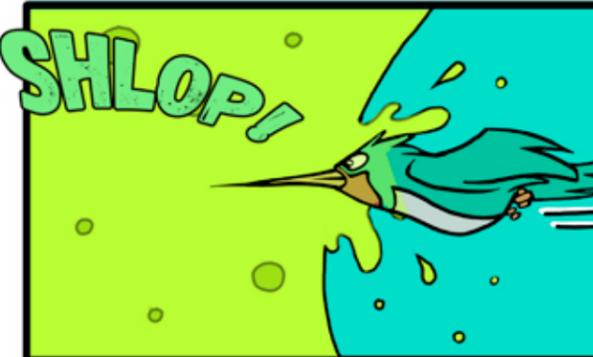
SPLOOSH!



It must be an alien or something! Get it, Mac!



Time to phone home, alien scum! Get a taste of my Extraterrestrial Terror Terminator!



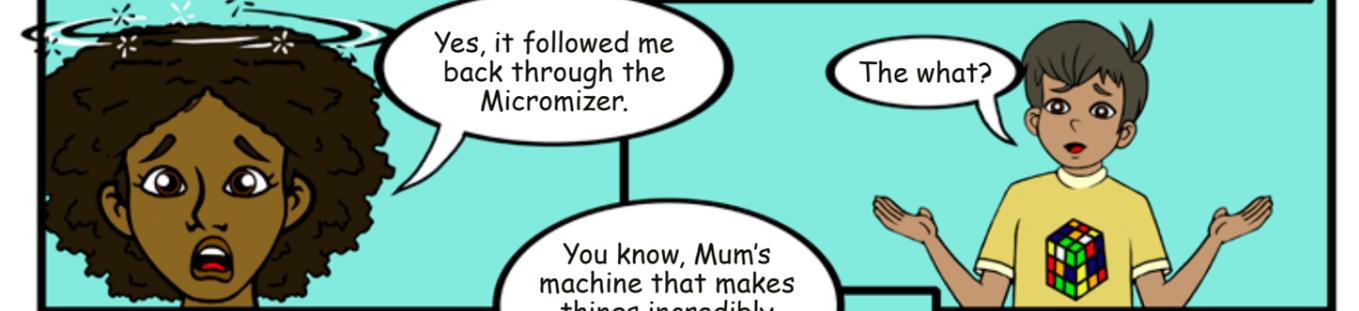
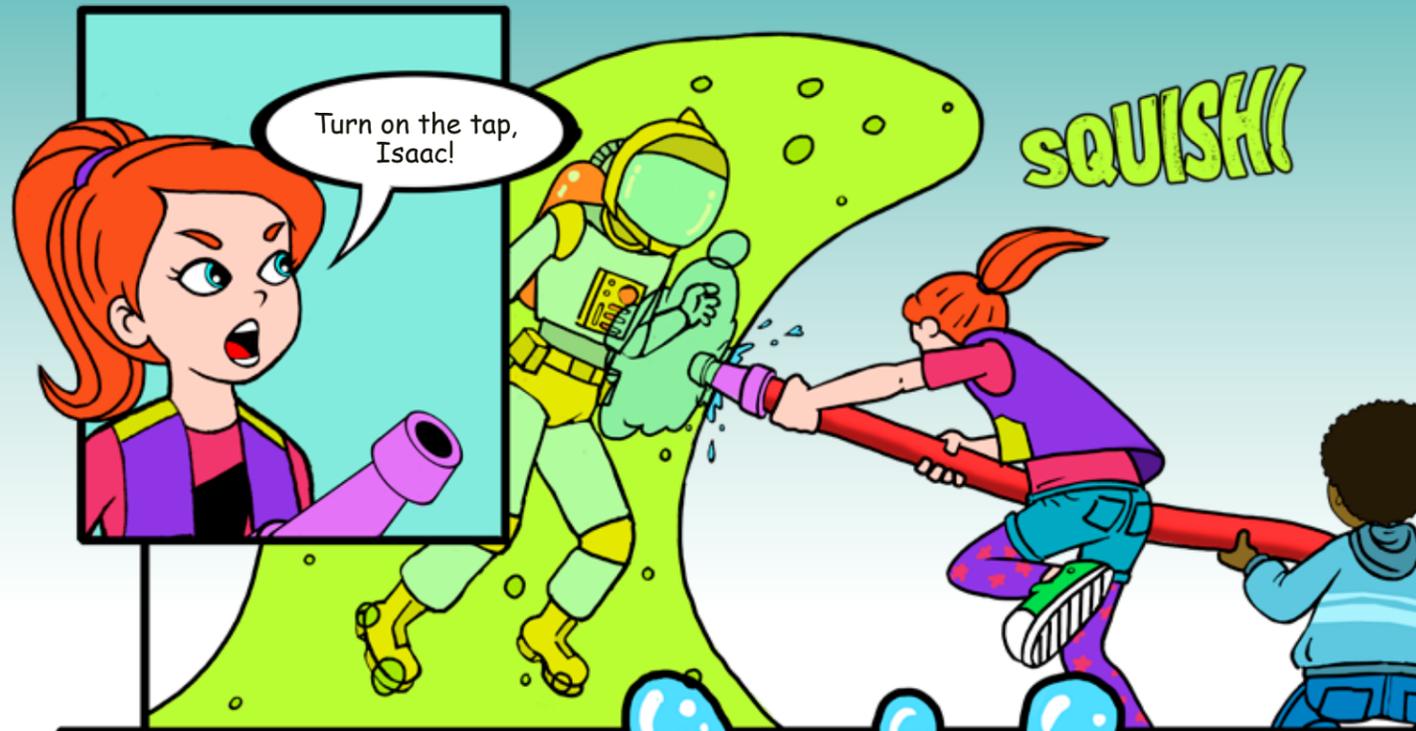
SHLOP!



Holy smokes! It ate him too!



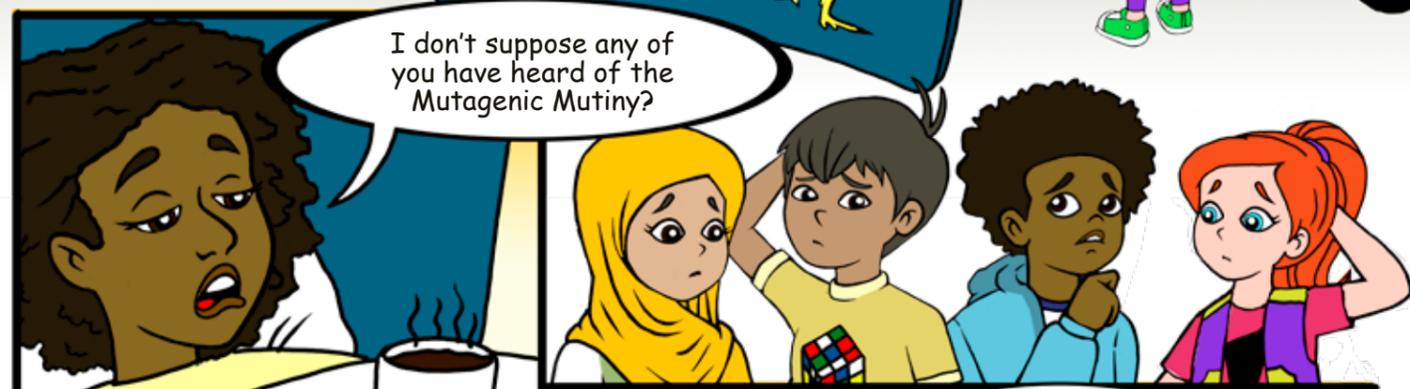
Hungry, eh? How about a drink?



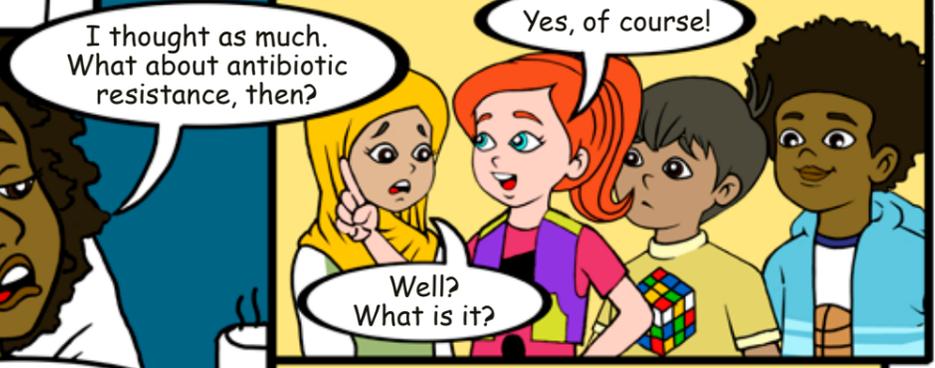


Well, this was unfortunate.
Are you feeling better, Mum?

What were you doing, Professor Matrix?



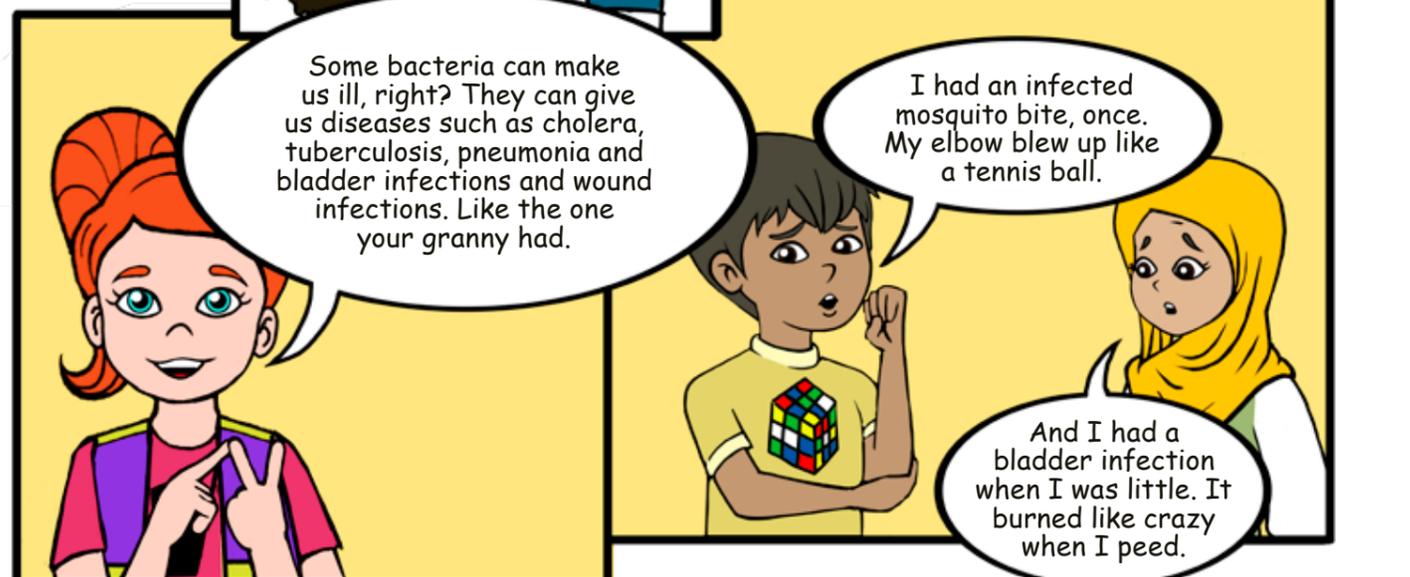
I don't suppose any of you have heard of the Mutagenic Mutiny?



I thought as much. What about antibiotic resistance, then?

Yes, of course!

Well? What is it?



Some bacteria can make us ill, right? They can give us diseases such as cholera, tuberculosis, pneumonia and bladder infections and wound infections. Like the one your granny had.

I had an infected mosquito bite, once. My elbow blew up like a tennis ball.

And I had a bladder infection when I was little. It burned like crazy when I peed.



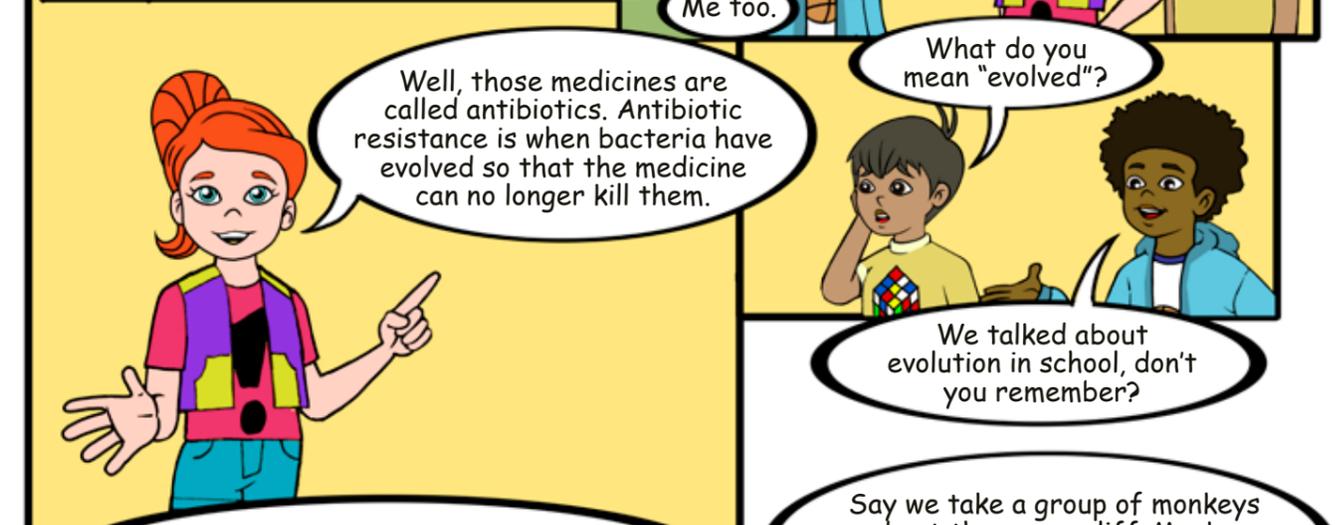
My granddad had pneumonia last year. He almost couldn't breathe.

And then what happened?

He got medicine and then after a while he was okay.

Same.

Me too.



Well, those medicines are called antibiotics. Antibiotic resistance is when bacteria have evolved so that the medicine can no longer kill them.

What do you mean "evolved"?

We talked about evolution in school, don't you remember?



Evolution means that all living things adapt to their environment to survive.

Say we take a group of monkeys and put them on a cliff. Monkeys with long arms can climb faster than those with short arms.

They reach more food, grow stronger and have more babies. The babies inherit their long arms from their parents.

But then a group of monkey-eating eagles arrives. Now the monkeys must find their food during the night, or else they get eaten.

So, only monkeys with good night vision survive and have babies.

Freaky monkeys ... give me the creeps.

When the environment changes, the things living in it change too.

Exactly! Antibiotics are fantastic medicines, but we are using them too much. And often for the wrong reasons.

We are letting out so many antibiotics in the environment, that the bacteria have evolved to survive. Just like the monkeys.

The bacteria have become resistant. This means that the antibiotics cannot hurt them. And that we cannot cure the diseases with antibiotics.

Yes, the more antibiotics we use, the more resistant bacteria we get. It's spreading over the world like wildfire.

But you will come up with new medicines, won't you, Professor Matrix?

It won't help us in the long run, Aisha. The bacteria will just keep evolving.

They are a rather nasty group of bacteria.

So... it's hopeless then?

No. But we need to use antibiotics in a smarter way. So, who are the Mutagenic Mutiny?

For years, they have been collecting information about antibiotics to make a bomb.

Yes. A bomb that would quickly make bacteria evolve to become resistant to every antibiotic in the world. And today they found the final part.

A bomb?

Yikes ...

You can't, Mum. You need to rest.

They will blow up the bomb in the hospital sewers, making the bacteria in the hospital unstoppable. Then it will spread to the world. Unless I stop them...

We'll go instead. Right, gang?



This is awesome. I look like a robot!

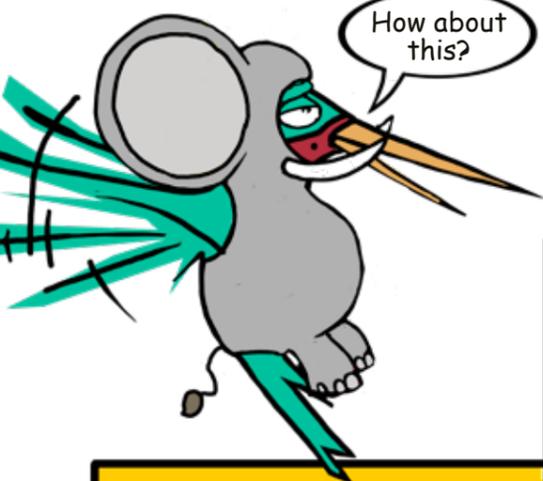
Now you will need to disguise yourselves to blend in.



You wouldn't think so, but he loves dressing up!



Finally!



How about this?

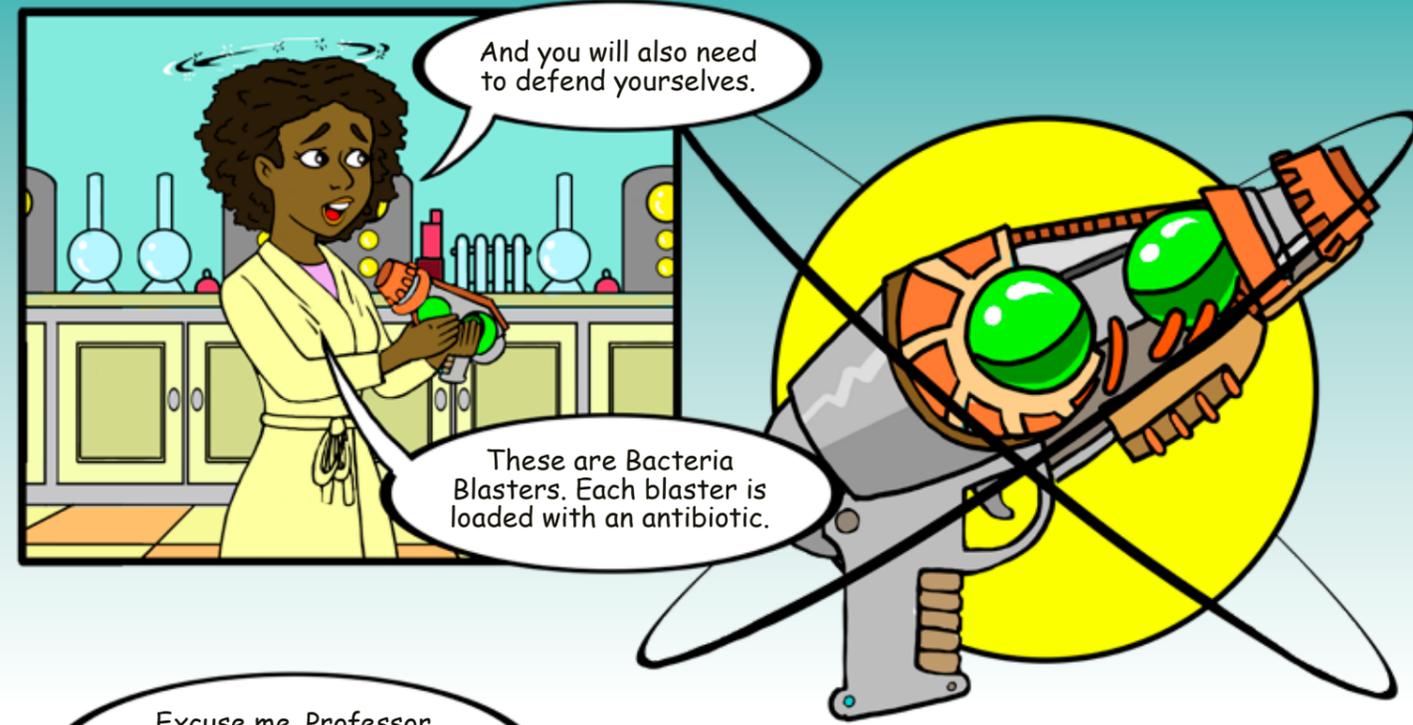
No.

What about this, then?



No. We must look like amoebas, Mac!

Oh, how nice ...



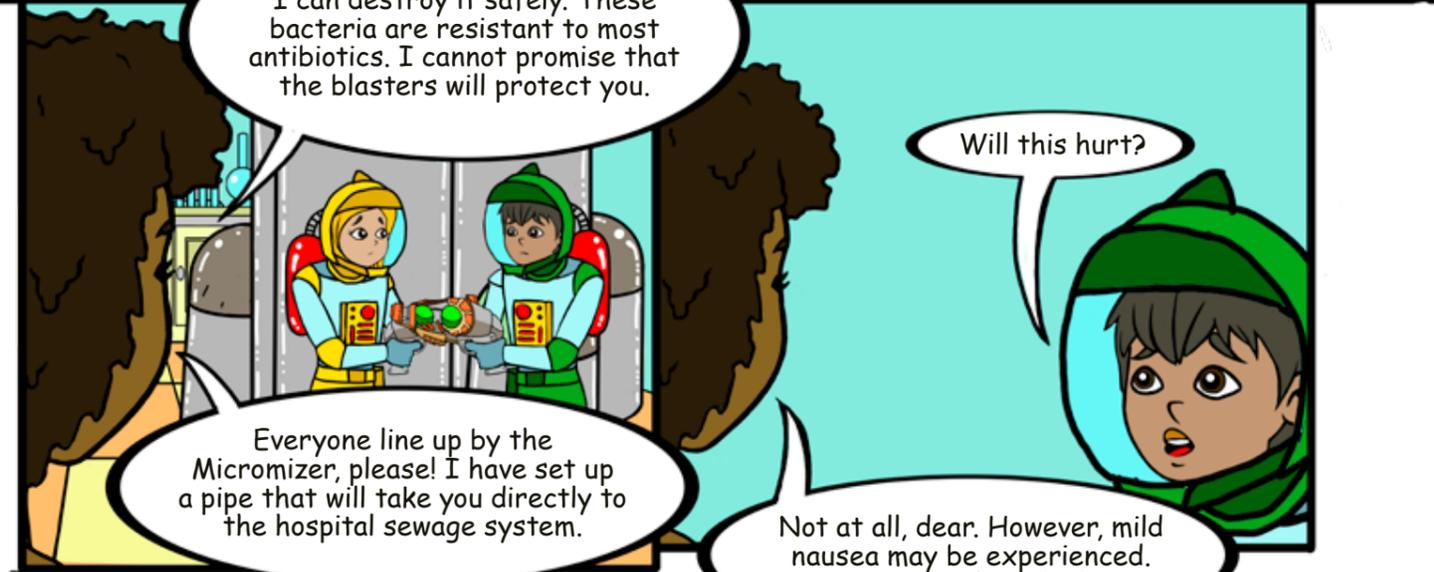
And you will also need to defend yourselves.

These are Bacteria Blasters. Each blaster is loaded with an antibiotic.



Excuse me, Professor. Exactly what are we supposed to do? Kill the bacteria with the blasters?

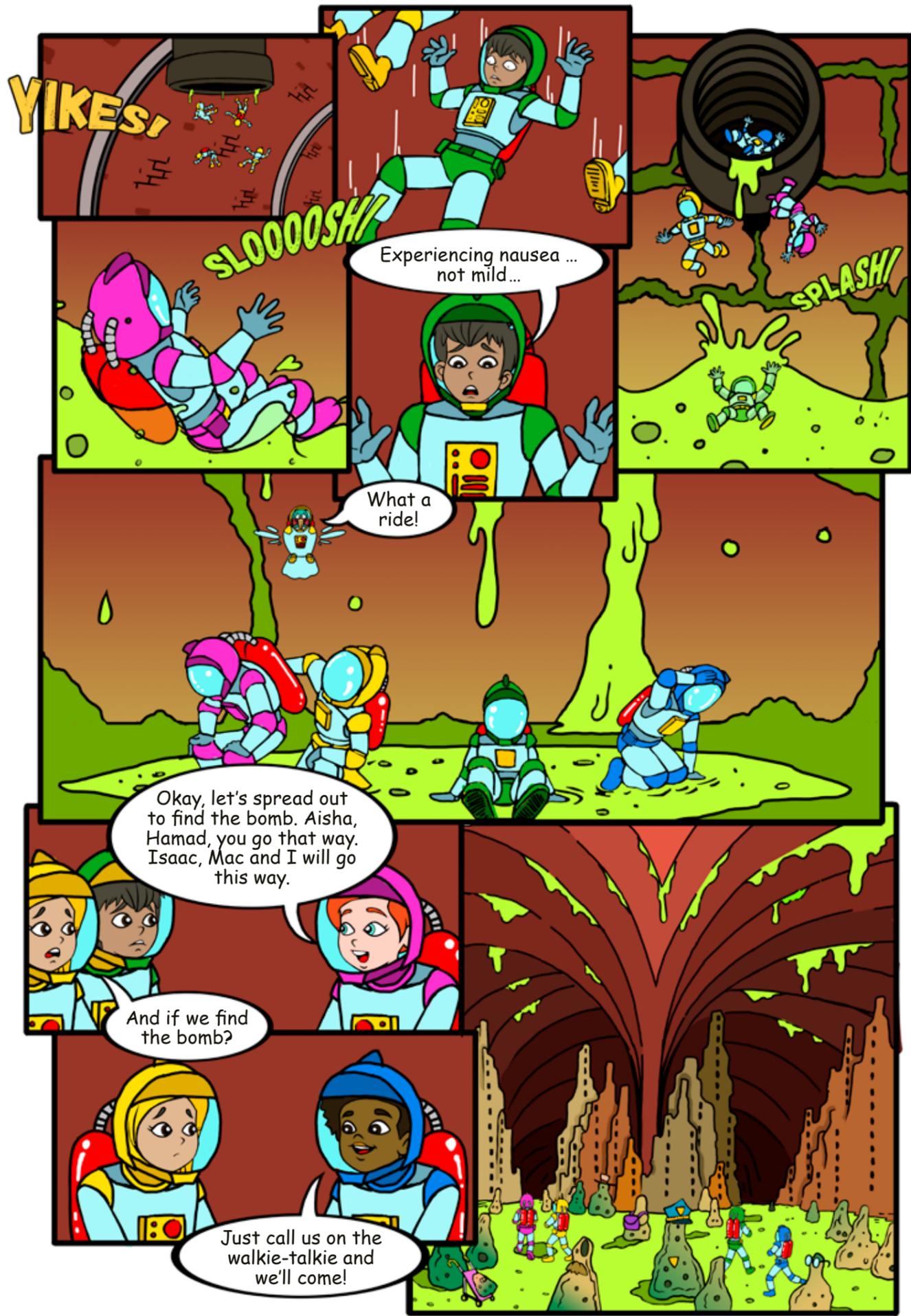
Get me their bomb, so that I can destroy it safely. These bacteria are resistant to most antibiotics. I cannot promise that the blasters will protect you.



Will this hurt?

Everyone line up by the Micromizer, please! I have set up a pipe that will take you directly to the hospital sewage system.

Not at all, dear. However, mild nausea may be experienced. Step into the funnel, please.



YIKES!

SLOOOOSH!

SPLASH!

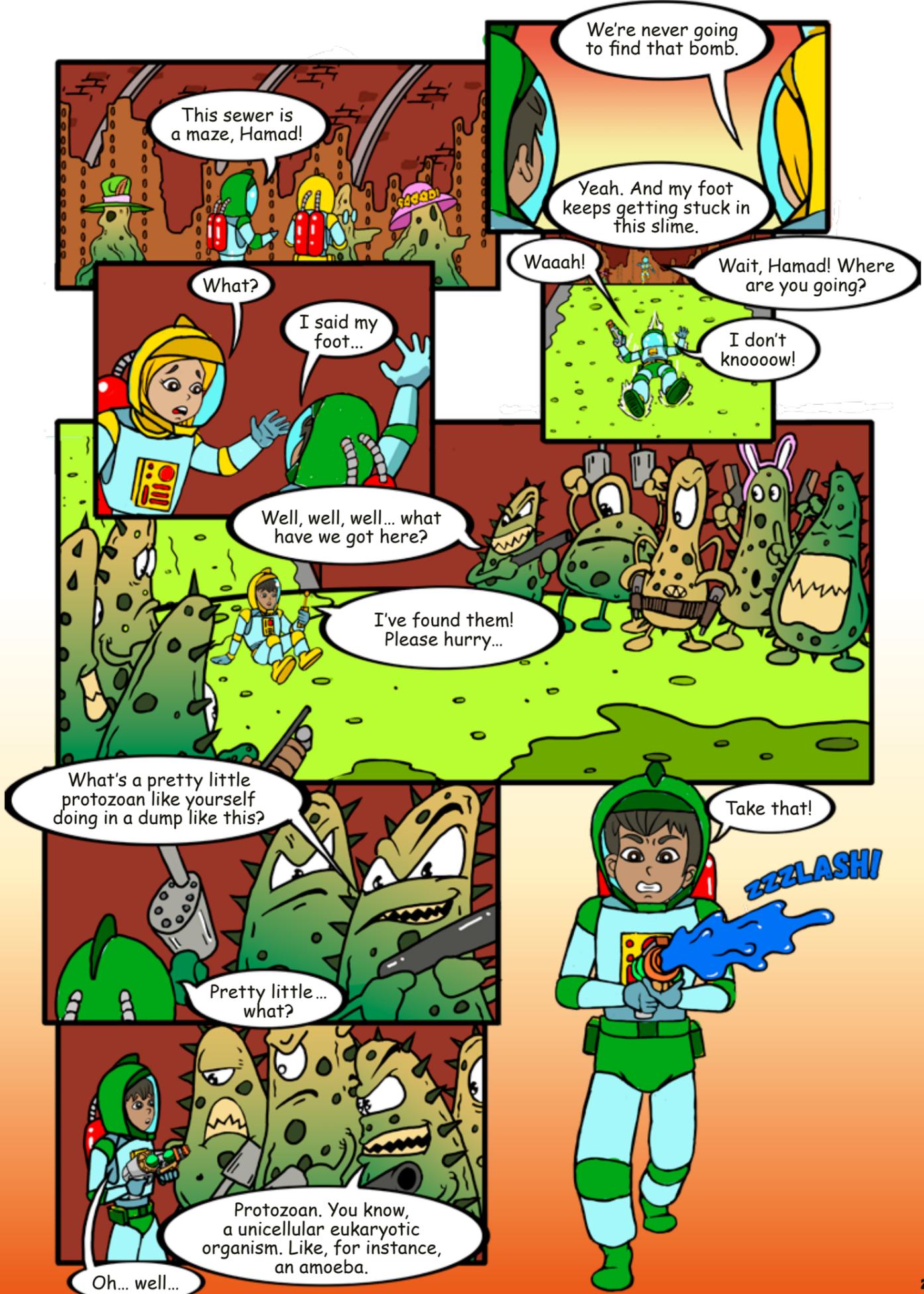
Experiencing nausea ... not mild...

What a ride!

Okay, let's spread out to find the bomb. Aisha, Hamad, you go that way. Isaac, Mac and I will go this way.

And if we find the bomb?

Just call us on the walkie-talkie and we'll come!



This sewer is a maze, Hamad!

We're never going to find that bomb.

Yeah. And my foot keeps getting stuck in this slime.

Waaah!

Wait, Hamad! Where are you going?

I don't knooow!

What?

I said my foot...

Well, well, well... what have we got here?

I've found them! Please hurry...

What's a pretty little protozoan like yourself doing in a dump like this?

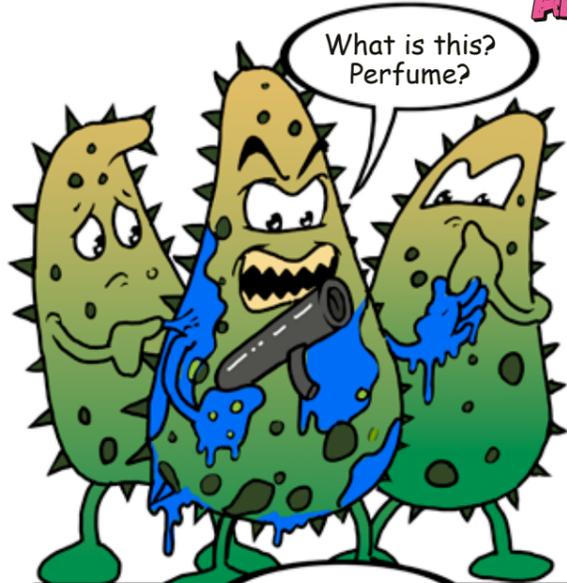
Pretty little... what?

Protozoan. You know, a unicellular eukaryotic organism. Like, for instance, an amoeba.

Oh... well...

Take that!

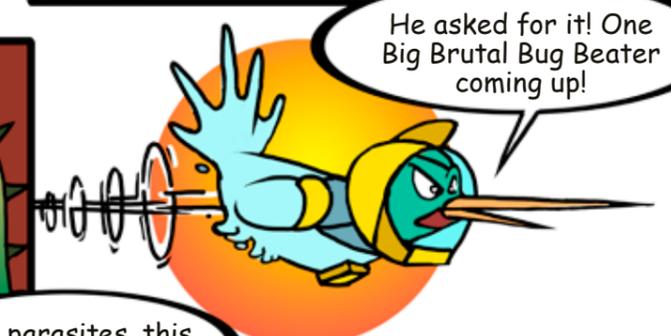
ZZZLASH!



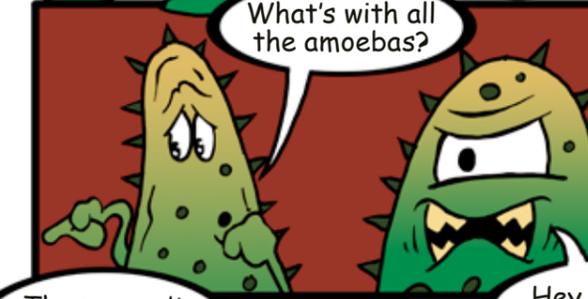
What is this? Perfume?



Oh dear...



He asked for it! One Big Brutal Bug Beater coming up!



What's with all the amoebas?

These aren't amoebas! They're tiny humans!



Hey, parasites, this is our turf. Beat it!

There's the bomb!

Blow it up now, Sir! Before they stop us.



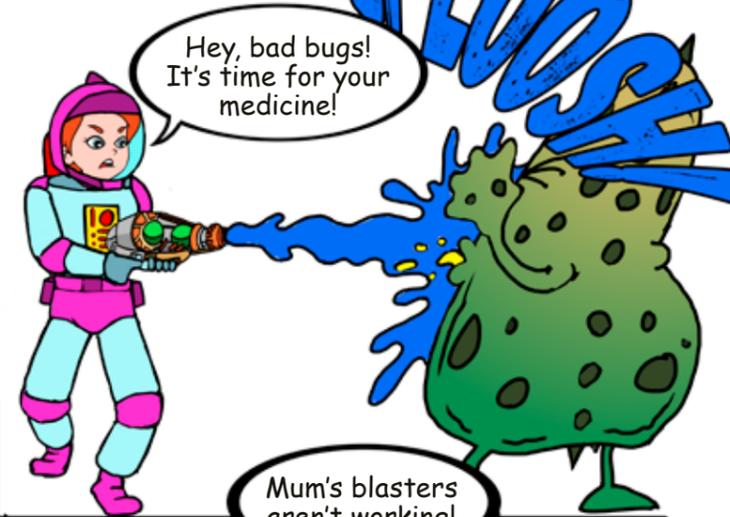
Hah! Stop us? Them? Besides, time is already ticking.

You're too late! We're going to rule the world!



Get the bomb! Hurry!

ZBAPPI!



Hey, bad bugs! It's time for your medicine!

Mum's blasters aren't working!



Hah! That all you got?



ZBOPPI!



KRRUNCH!



They are resistant to the antibiotics! Let's aim for the same one.



Mixing our antibiotics? Clever!



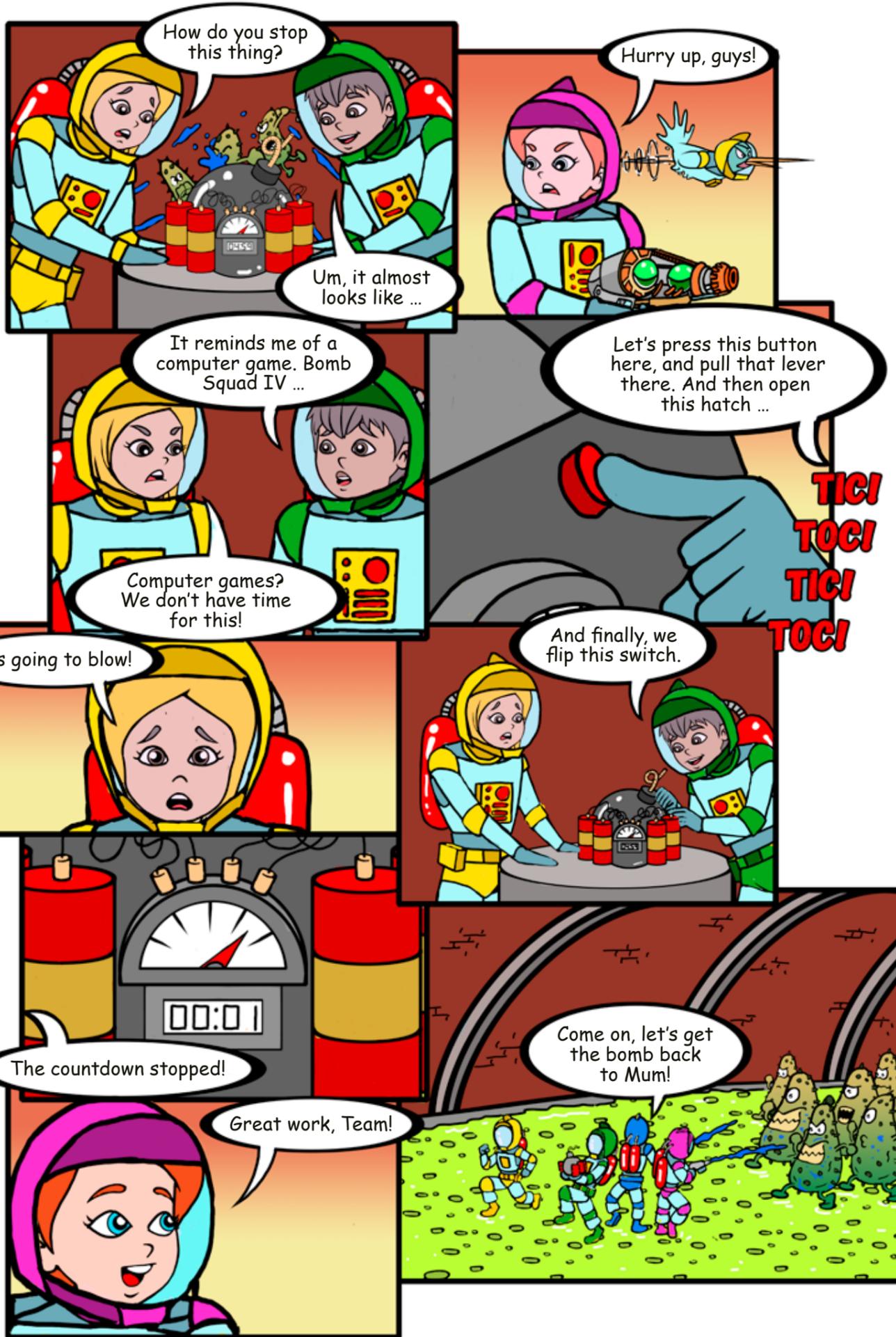
Ow! That stings! I can't see!

SPLASH!



It's still not killing them!

But at least it's slowing them down!





You did it! I can't believe you did it!

It was easy, really.

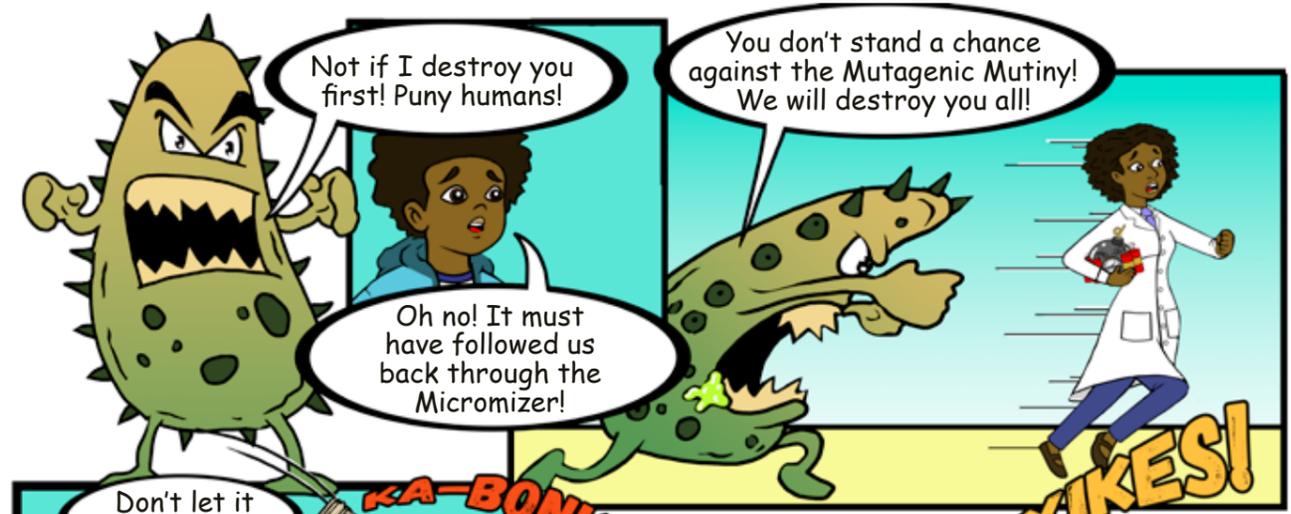
But the blasters didn't work, Mum. The bacteria were resistant to our antibiotics.

I feared as much. But thankfully they did not have time to set off the bomb.

Great job disarming the bomb, Hamad!

You know, computer games...that's my thing.

And now I'll make sure that the bomb is safely destroyed.



Not if I destroy you first! Puny humans!

You don't stand a chance against the Mutagenic Mutiny! We will destroy you all!

Oh no! It must have followed us back through the Micromizer!



Don't let it get the bomb!

KA-BONKI!

Ha-ha! Humans are no match for me!

What about hummingbirds, then?

Huh?



Behold my BACTERIA BERSERK BOMBARDMENT!

SPLASH! SPLISH!



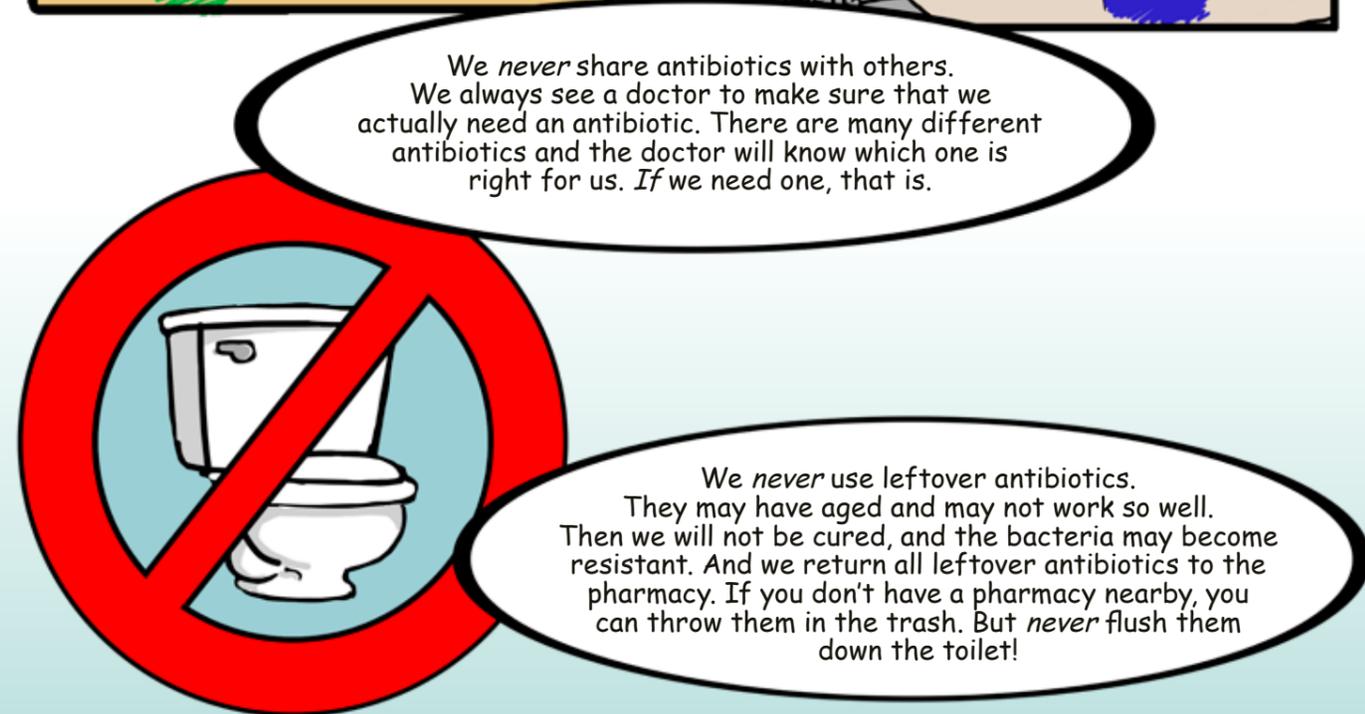
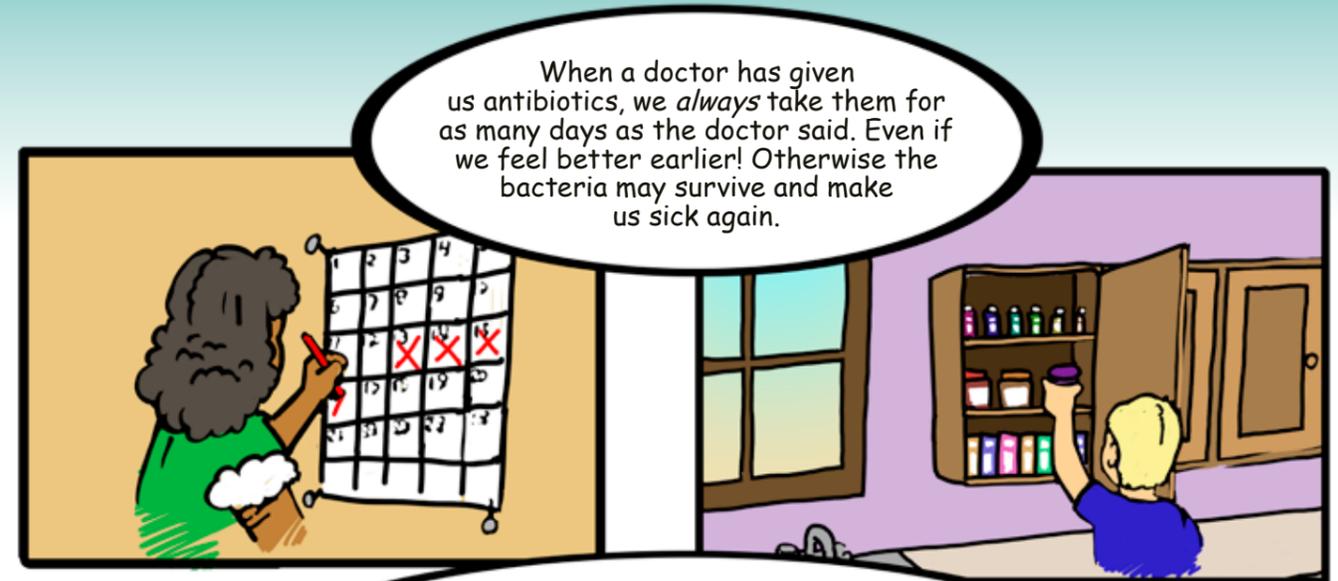
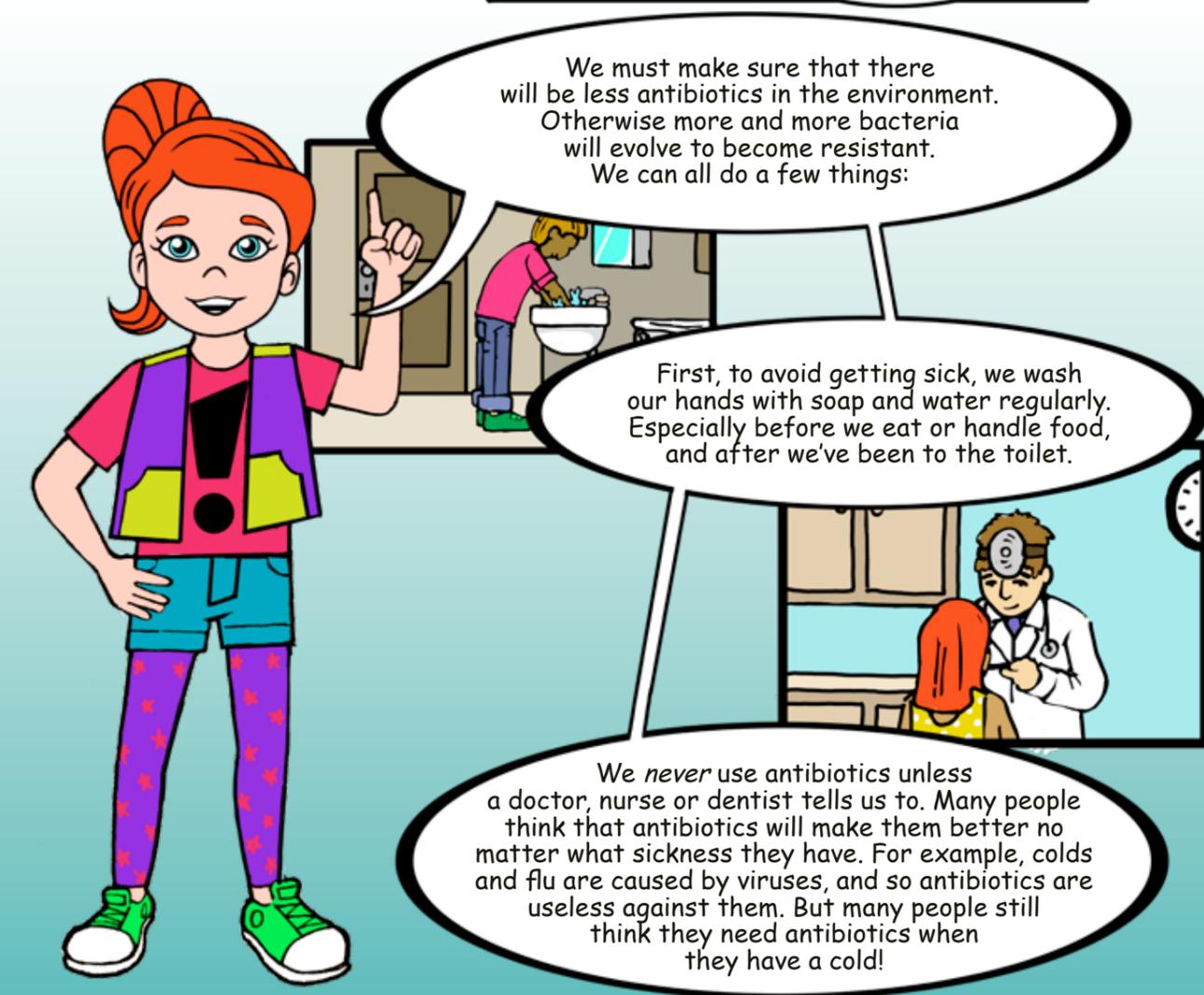
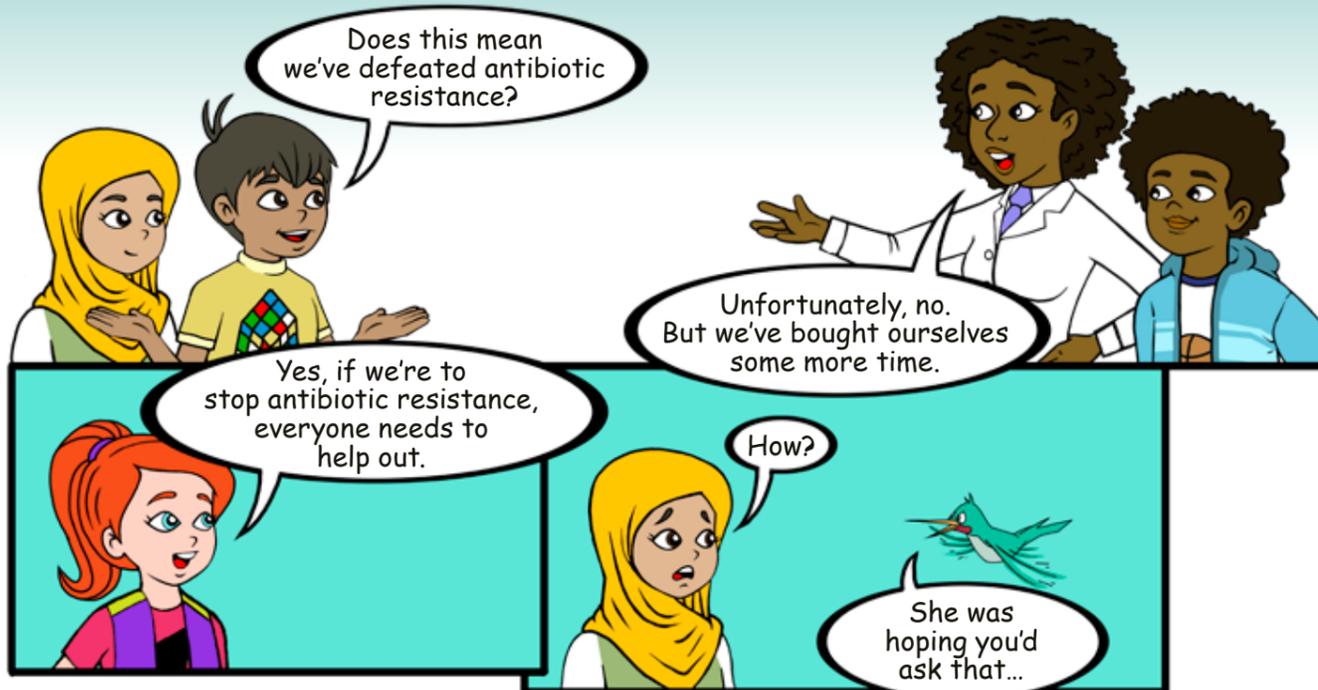
SPLOSHI!



Resist that!



Go, Mac!



We tell our family and friends about this. We must all work together to stop antibiotic resistance!

THE END



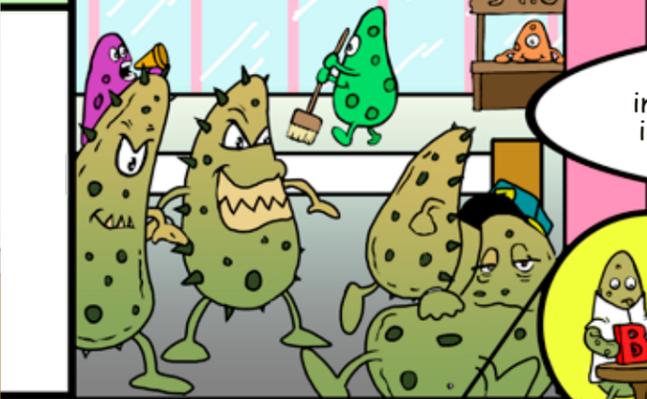


ANNIE'S MEDICINES SAFETY FACTS

GOOD BACTERIA BAD BACTERIA



Now, you may think that all bacteria are bad for us. But that's not true! We have trillions of bacteria on and inside our bodies, doing a great job keeping us healthy.



For example, we have bacteria in the intestines that help us make important vitamins and digest the food we eat.

They also stop nasty bacteria from making us sick. Bacteria on our skin can also stop harmful bacteria from growing there.



This is another important reason not to take antibiotics unless we really have to - they harm our helpful bacteria! For example, antibiotics kill helpful bacteria in our intestines. This is why we often get diarrhoea when we take antibiotics. When we remove our helpful bacteria, it is also easier for harmful bacteria to attack us.



By the way, how many is a trillion?

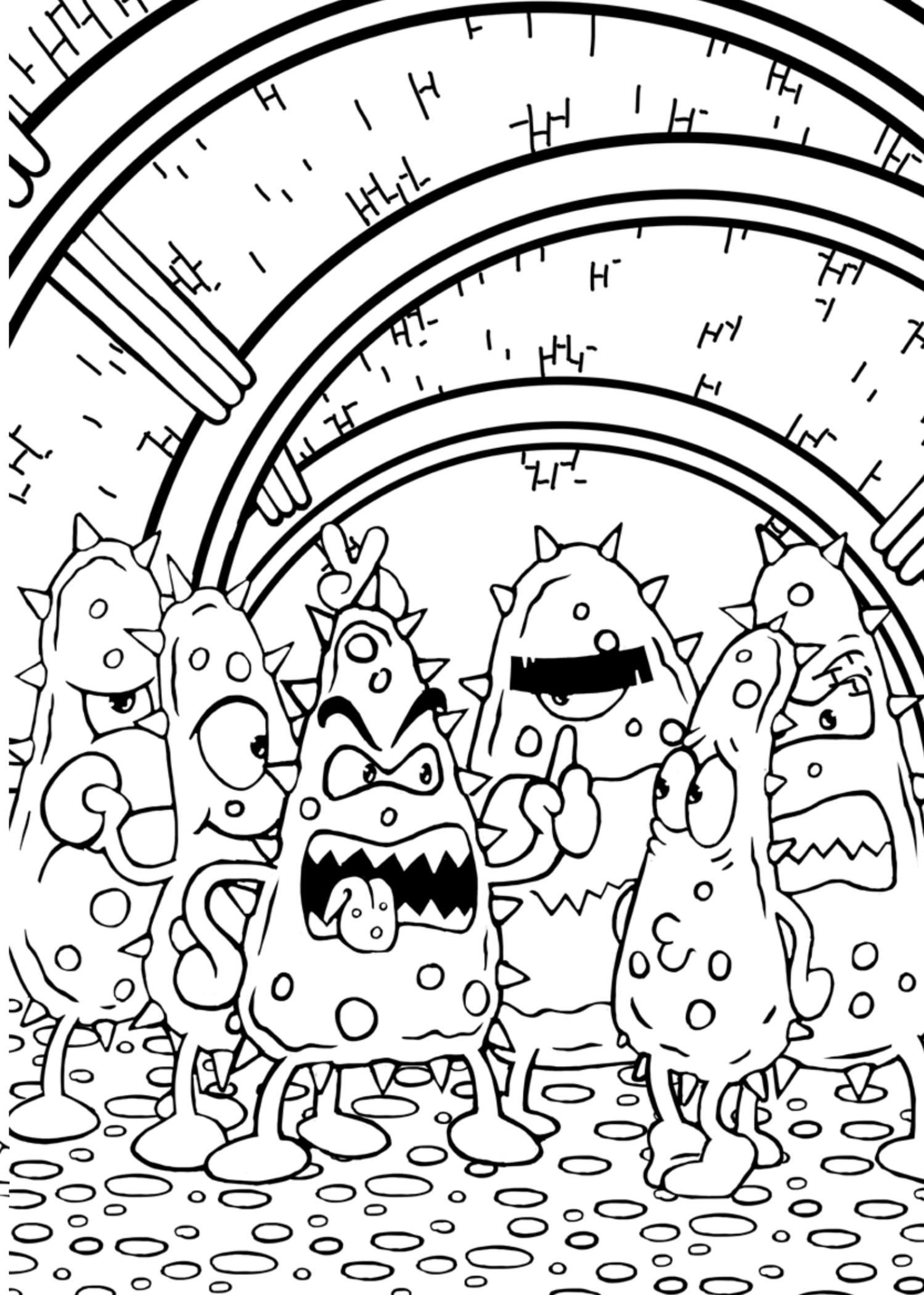
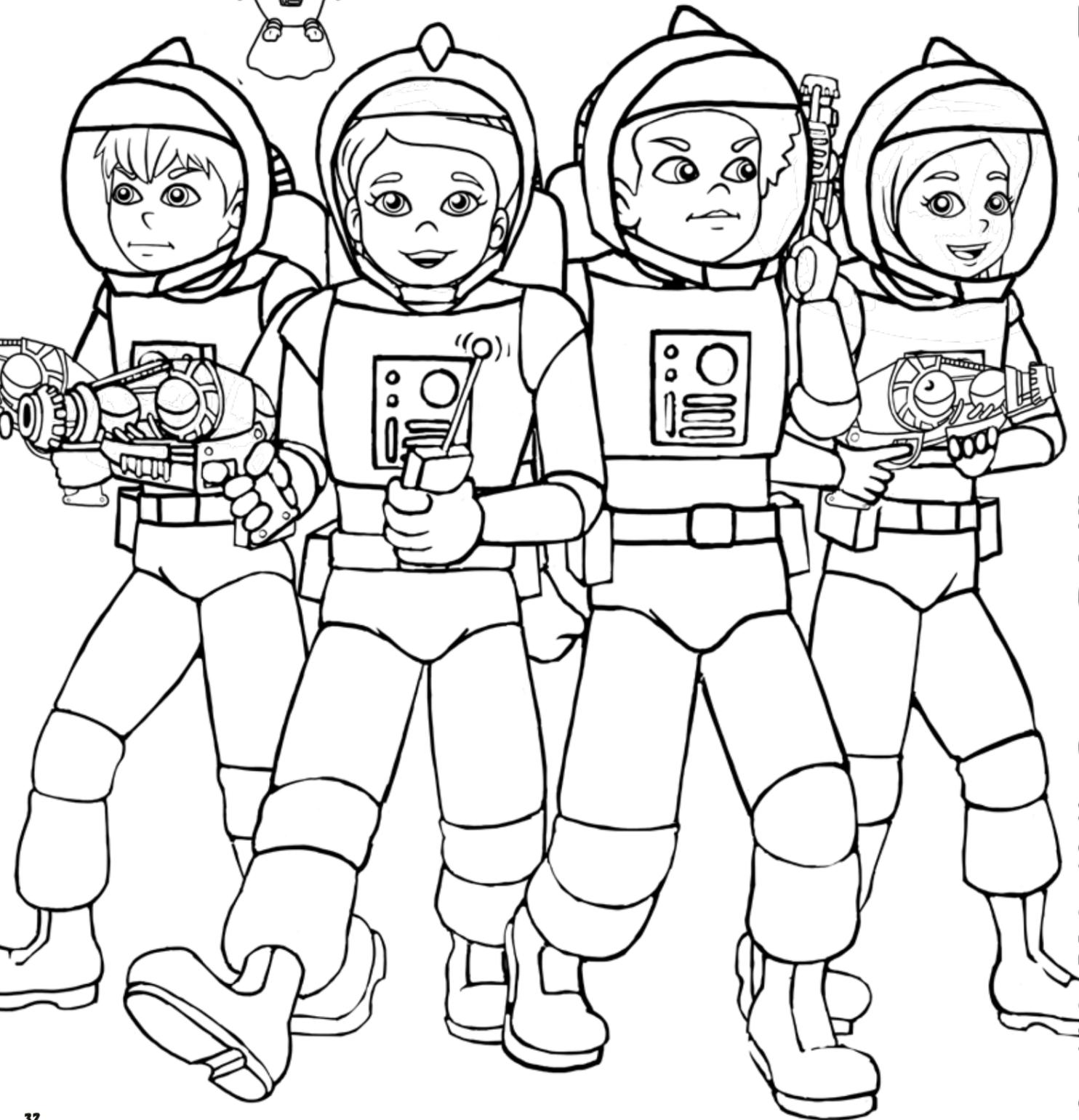
A trillion is 1 000 000 000 000, and we humans have tens of trillions of bacteria in our bodies.



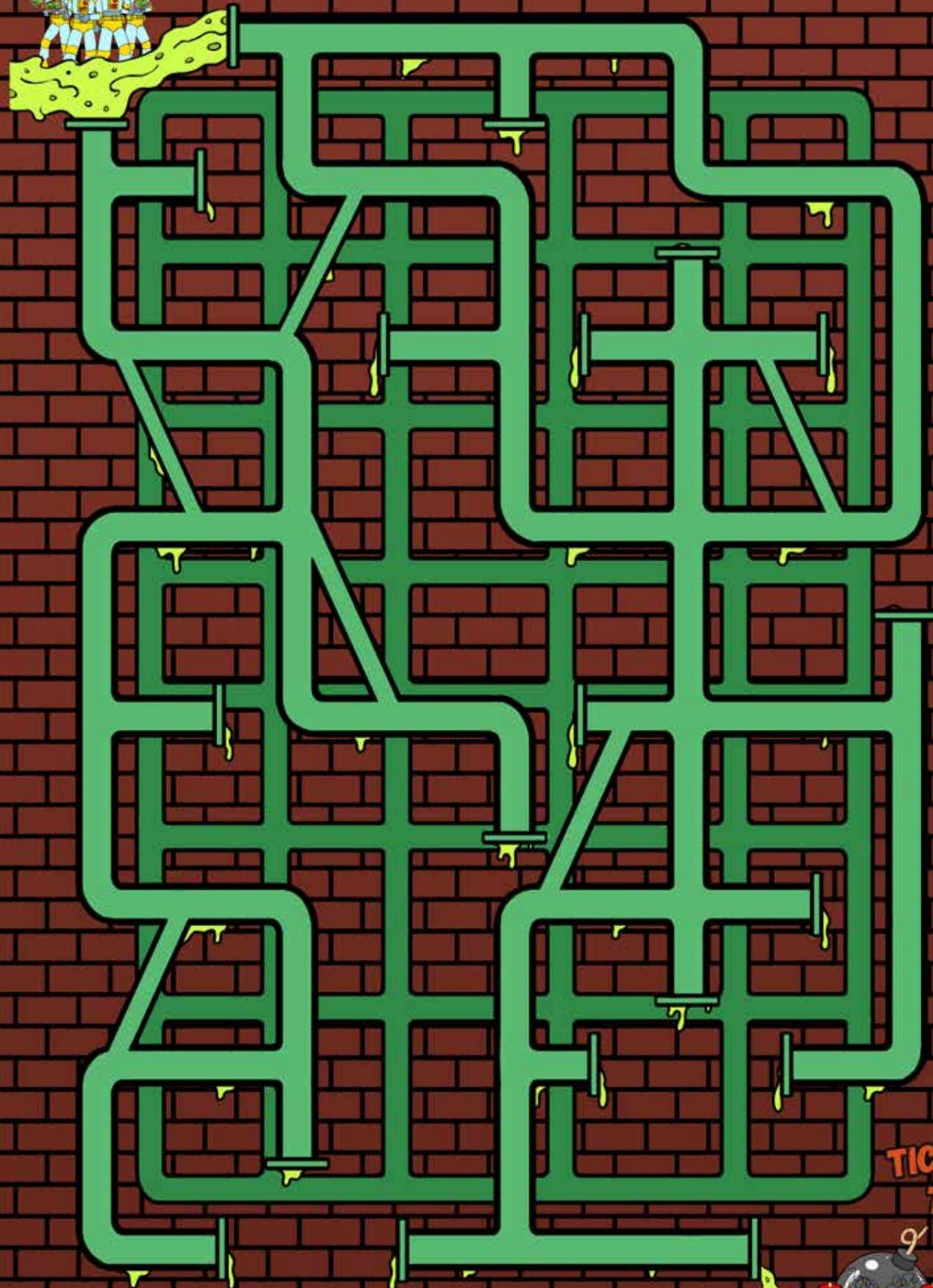
Yikes! No wonder you're all so big!

COLOUR ME!

THE HUNT IS ON! HELP TEAM SAFE MEDS DISGUISE THEMSELVES TO BLEND IN WITH THE OTHER BACTERIA.



THE MUTAGENIC MUTINY HAVE HIDDEN THEIR BOMB DEEP INSIDE THE SEWERS. HELP TEAM SAFE MEDS FIND THEIR WAY TO THE BOMB BEFORE IT EXPLODES!



**TIC TOC
TIC TOC**



Hey team, what do you think is beyond those hills?

Come on! What are we waiting for?

More adventures and new *Take&Tell songs!

THIS COMIC IS PRODUCED BY UPPSALA MONITORING CENTRE (UMC). UMC IS A NON-PROFIT FOUNDATION (WE DO NOT SELL THINGS TO MAKE MONEY). WE DO RESEARCH AND KEEP AN EYE ON HOW MEDICINES ARE USED. BY WORKING WITH DIFFERENT TEAMS AROUND THE WORLD, WE HELP PEOPLE MAKE GOOD AND SAFE DECISIONS ABOUT WHICH MEDICINES TO USE, AND HOW TO USE THEM. AND WE HAVE BEEN DOING THIS FOR MORE THAN 40 YEARS. OUR GOAL IS A WORLD WHERE EVERYONE – PATIENTS, DOCTORS, NURSES, PHARMACISTS – MAKE WISE DECISIONS IN THEIR USE OF MEDICINES. THIS COMIC IS THE SECOND IN A SERIES THAT WILL EXPLORE AND EXPLAIN IMPORTANT MEDICINES SAFETY ISSUES. WE HOPE YOU ENJOY IT!

***TAKE&TELL IS A CAMPAIGN TOOLKIT DEVELOPED BY UMC, ENCOURAGING A SAFER USE OF MEDICINES. THE CAMPAIGN HAS SEVERAL CATCHY SONGS, ALL AVAILABLE AT: WWW.TAKEANDTELL.ORG**

WE NEED HELP TAKING ANNIE & MAC AROUND THE WORLD. PLEASE CONTACT US IF YOU'D LIKE TO HELP OUT! INFO@WHO-UMC.ORG OR FIND HERE A DOWNLOADABLE PDF: WWW.WHO-UMC.ORG

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**PLEASE CHECK
OUT OUR FIRST
ADVENTURE!**

