The New Zealand Curriculum
LEVEL 4

School JOURNAL

NOVEMBER 2022

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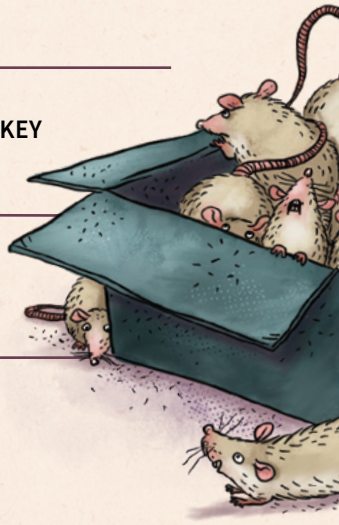


Ministry of Education

Kaitiakit

Most people think of a kaitiaki as someone who guards or protects the natural world. Maybe they look after a stream or beach, a native species under threat, or a local reserve. The term kaitiakitanga (the act of being a kaitiaki) comes from te ao Māori. It can mean each generation teaches the next about protecting taonga tuku iho – precious resources passed on by the ancestors. These resources include the land, ocean, rivers, lakes, mountains, and forests. Te reo Māori and Māori knowledge are also taonga tuku iho.

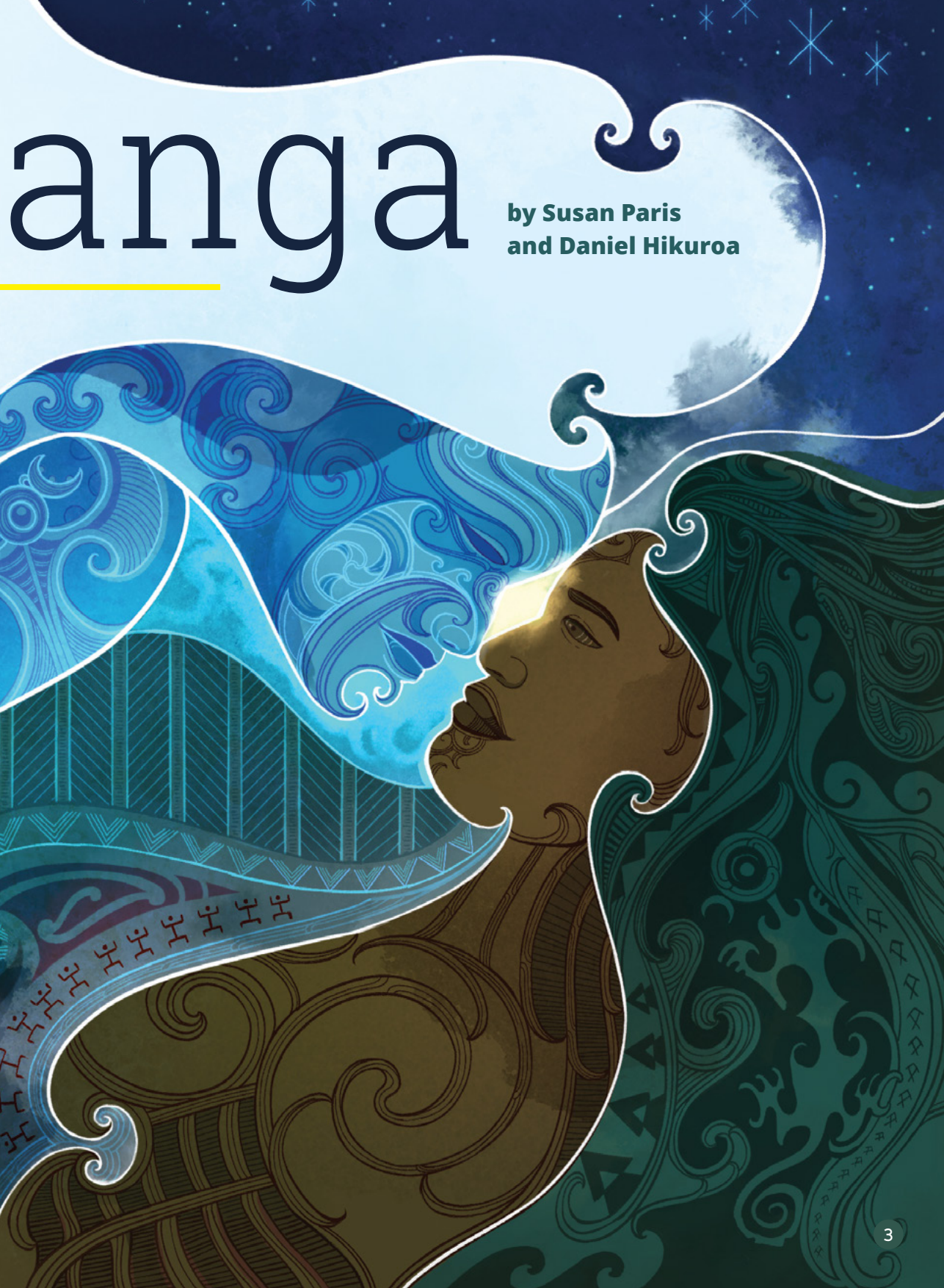
In recent years, interest in kaitiakitanga has grown as people work to protect the things that are important to them or are under threat.

Rangi and Papa

Iwi and hapū believe in a deep connection between people and the natural world. This is because Ranginui (the sky father) and Papatūānuku (the earth mother) are the first parents and kaitiaki. Rangi and Papa had many children, each of whom also became kaitiaki. Tāne Mahuta, for example, is the kaitiaki of the forest and all its creatures. Tangaroa is the kaitiaki of the ocean and waterways and all the creatures in these places. As well as the natural world, the children of Rangi and Papa brought humans into being.

anga

by Susan Paris
and Daniel Hikuroa



Rhiannon Mackie

OUR FUTURE ON THE LINE

When she was eight, Rhiannon Mackie read an article about climate change. It came as a shock that people had changed the environment so drastically, yet Rhiannon had "complete faith" the problem would go away. Four years later, reality hit. Nothing had changed. "I finally understood the **magnitude** of the crisis," she says. "Our future was on the line, yet I felt completely powerless."

At first, Rhiannon did nothing. She had no idea where to start. Then she began to hear about young climate activists like Mitzi Jonelle Tan and Greta Thunberg. They became her role models. Rhiannon was soon working with young activists in Aotearoa, and from there, she says, "things just grew". Now she spends hours every week raising awareness of the climate crisis.

Rhiannon believes young people have a huge amount of influence, and she wants to ensure they have the skills to speak out. "We're the ones who will live to see the consequences of what happens." Rhiannon talks about climate change in schools, and she's helped other young activists meet with world leaders. In June 2022, she attended a United Nations conference in Sweden. The right to a healthy environment was the main issue.

Becoming a climate activist didn't feel like a choice for Rhiannon. She believes previous generations have done "the bare minimum" to clean up their act; she didn't want hers to make the same mistake. Rhiannon says there's a huge disconnect between people and nature. "But in reality, we're part of the environment. Forgetting this has led to the triple threat we now face: climate change, the loss of **biodiversity**, and pollution."

Rhiannon often thinks about the people who will come after us. "It's our responsibility to care for the environment on their behalf. They won't have the same chance as us; it will be too late. It's up to my generation to build a better world."

magnitude: the great size of something
biodiversity: the variety of plant and animal life in the world


"We're part of
the environment.
Forgetting this
has led to the triple
threat we now face."


"OUR ANCESTORS GIVE US MANA, BUT WE RETURN THAT MANA BY THE WAY WE LIVE."

Nigel How

WAIROA'S TREASURE CHEST

Few people know more about the history of Wairoa than Nigel How. "Before 1865," he says, "Māori ruled this place. We built our own ships. We sold our wheat and wood in England. There was a lot of wealth here. Life was good."

Nigel is fascinated by the past, especially Wairoa's. "Every nook and cranny in this rohe is rich with kōrero." Nigel first heard some of this kōrero as a boy when his nana took him to hui. She knew he loved listening to family stories, and she wanted him to meet local kaumātua and hear their stories, too. He'll never forget the people he met and the things they told him. Learning about the past gave Nigel a sense of identity – and it made him feel empowered. "Our ancestors give us mana, but we return that mana by the way we live. They're watching us. They sit on our shoulders."

Nigel's whānau wasn't surprised when he became a historian. He now works at the Wairoa Museum, a place he calls the community's treasure chest. It's filled with taonga and stories. Nigel's favourite taonga is a carving named Te Kawiti, the museum's first family member. According to Nigel, Te Kawiti is around 250 years old. He's the oldest living local – and quite a character.

"Te Kawiti likes the staff to say mōrena, otherwise he plays with the lights." To keep Te Kawiti happy, he was moved to a prime spot near the window. From there, he could look out across the river to where he first lived with his people, Ngāti Kurupakiaka.

Local stories are brought to life by tīpuna like Te Kawiti, but Nigel says historians – as the kaitiaki of these stories – also play an important role. "It's our job to help the past feel alive and be truthful and relevant," he says. Respect is also high on his list. "Life was different back then. Our tīpuna had their own values. We don't have to agree with everything they did, but we can't judge. History teaches us about **empathy**, something we all need if we're to get along."

empathy: to be able to understand and share another person's feelings

"Pounamu is a treasure, and I treat it that way."

Ana Krakosky

WITH MY TŪPUNA

Ana Krakosky didn't spend time on marae when she was growing up, and she didn't know much about her iwi, Te Āti Awa. It felt like part of her was missing. Ana's a jeweller now. She likes making things from pounamu. The stone helps her feel close to her ancestors. "Working with pounamu is like working with my tūpuna," she says.

If being a jeweller has connected Ana with her culture, knowing more about te ao Māori also helps with her work. "Sometimes," she says, "a **whakataukī** will start me thinking, and I'll get an idea for a new piece." But like a lot of artists, Ana's ideas come from all over the place: the sight of raindrops on water, the curl of a leaf. Or Ana might look at a stone and "just see a piece forming". She'll do a quick drawing, practise with clay, pick a material, and make a start.

Ana enjoys working with different materials. "I love taking a rock and turning it into something beautiful." Sometimes those rocks are just rocks, but Ana says pounamu is different. Using it comes with responsibilities. "There are many traditions when you work with pounamu. I honour my ancestors by following them. I want to be a good kaitiaki."

As a kaitiaki of pounamu, Ana is careful to source it from the right people, and she wastes nothing. "Pounamu is a treasure, and I treat it that way." Māori carvers believe their wairua becomes part of an artwork when it's made from pounamu. Some also consider themselves in a state of tapu while they carve. Ana follows this tikanga. She avoids her studio if she's upset or angry, and she doesn't eat or drink near her work. She cleanses herself with water at the end of each session to **whakanoa** so she's no longer in a tapu state.

Ana likes learning about who she is. She says everyone needs a sense of belonging. "If I have pride in my whakapapa, I can help other people feel the same. Then the world will be a better place."

whakataukī: a Māori proverb
whakanoa: to free something from being tapu

Evan Lobb

NATURE, DOING ITS THING

Evan Lobb grew up on a farm near Inglewood. He remembers the mountain, cows, and endless grass. Taranaki is known for its fertile soil and big dairy farms. The dairy factory near Hāwera is one of the largest in the world. But still, Evan wondered if all that grass, without any bush, was a good thing.

After he left school, Evan travelled. He never forgot the landscapes he saw: endless desert in the Middle East; palm-oil trees where Indonesian rainforest had once stood. Back home, with fresh eyes, he saw what New Zealand still had: biodiversity. Inspired by kaitiakitanga, Evan resolved to do his best to help protect that biodiversity.

Evan settled in North Taranaki and became a farmer. He grazes young dairy cows, which still need a lot of grass, but his 400-hectare farm is different from others. There's a forest, a wetland, **regenerating** bush, and dozens of native wildlife species. Because of this, Evan chose to put a **covenant** on a large part of his land. This means it can't be used to graze animals, even if the farm is sold.

Evan says fencing off 280 hectares wasn't a hard choice. Much of it is steep hill country and difficult to farm, and he knew there were pekapeka, kōkopu, kiwi, longfin and shortfin tuna, and kārearea. The forest is special, too, with tawa, miro, rewarewa, enormous rimu, and four different kinds of rātā in danger of becoming extinct. Even the wetland is unique. Protecting this biodiversity gives Evan hope for the future. "Now," he says, "nature can do its thing – forever."

Evan is committed to caring for his land. He spends two days a month on pest control, checking a hundred traps. He's fenced off sand dunes and planted along waterways, and he rounds up cattle on foot. He owns an electric car, and he's just bought an electric quad bike. Evan says people could still "find holes" in his lifestyle, but it makes him feel good to treat the land in a more balanced way. He's seen what happens when we don't. "If you keep pushing at nature, you lose it."

regenerating: growing back
covenant: a set of rules that affects how a landowner can use their property


"If you keep pushing at nature, you lose it."

Going in Nature

by James Brown

"Urgh," said Dad, "that's disgusting."

"Yep," I said, backing away.

"That's freedom campers for you."

"It looks like dog poo, Dad. It's right in the middle of the grass."

"It would have to be an enormous dog, Tessa."

"Like Clifford."

Dad laughed. Mrs Dooley, who ran the local store, did have a big red dog called Clifford. I surveyed the reserve and was about to point out the lack of toilet paper when Dad started scrambling about on his hands and knees to photograph the poo.

"Dad!"

"Something needs to be done about this."

"Yes, but not that. Come on, Dad."

That night, Dad went into battle with his laptop. I steered clear, waiting for the inevitable cry for help. "Tessa! The printer's broken again ...," he called finally. "I need to print ten more copies."

I sighed and went over. Dad had written a very clear message. Underneath was his photo. The whole thing was what our teacher would call "a visual cacophony". Dad was delighted with it. "Let me have a play," I said. "Maybe I can improve the, er, layout."

"Glad you're on board. But don't change the words. I could've been a marketing guru."

Dad had once worked for a community newspaper. His "Ding-a-ling Your Cat" campaign, intended to encourage people to put bell collars on their cats to protect native birds, had divided the readership.

"Yes, but sales went *up*," he said when I reminded him of this.

"Sales? Wasn't it free?" I'd been a badly paid delivery girl and was never sure whether I should put his newspaper into letterboxes with No Junk Mail signs or not.

"Readership then. The readership went up."

I changed the fonts on his flyer so it didn't look like it had been designed by a three-year-old.

Our house backed onto the reserve, which we could reach through a gate by the old outhouse. Today, there was only one vehicle – a hand-painted van with a couple of hippy girls lounging outside. They looked like they'd just woken up. Dad went over and handed them his flyer. They examined it curiously.

"Are we not allowed to camp here?" asked one. "Do you want us to go?"

"No, no," said Dad. "It's about keeping the reserve tidy and not using it as a toilet."

"OK, no problem. We love going in nature, too." It wasn't exactly clear what she meant by this. "But," she pointed to the rubbish bin in the car park, "perhaps the rubbish needs collecting more often?"

She was right; the bin was spewing. And I knew campers weren't the only ones who used it because I'd had fish and chips with friends there last week, and we'd had to cram the paper in then.

Dad was embarrassed. Now that he was face to face with real campers, he didn't sound like such a NIMBY.

"Yes, that's bad," he agreed. "I'll phone the council and get them to empty it."

"And where are the facilities?" asked the other. She was running her fingers through her salt-straggled hair, trying to loosen the knots.

"Facilities?" Dad looked confused.

"Where are the public toilets?"

I realised we should have put this information on the flyer. "There are toilets and changing sheds on the beachfront," I said.

Standing here, I could see the problem. If people camping here needed to go, they might not want to walk all the way to the beach. The reserve was on the river, slightly inland – not too far away, but far enough, especially in the middle of the night. In between the reserve and the beach was a proper campground – Jenkins Beach Camp. Old Jenkins complained that freedom campers sometimes snuck in and used his facilities.

"It's not ideal," said Dad. "But that's where the, er, facilities are. If you camped on the beachfront, you'd be closer to them."

"But it says no camping there."

"Does it?" said Dad. "I didn't know that. That's silly."

As we retreated, I glanced to where we'd seen the poo the day before. Mysteriously, it had disappeared.

Dad emailed the council and the local paper. He wanted the rubbish bin emptied more often over summer. He wanted a toilet at the reserve. He wanted freedom campers to be allowed to camp on the beachfront where there were already facilities.

"Ha," he said. "The council won't want to put another loo at the reserve, so they'll take the cheaper option and let freedom campers stay in the beachfront car park. And that will solve the problem in the reserve!" He chuckled to himself as if he'd out-manoeuvred everyone.

“I’m with you,” said Mrs Dooley the following day. We were in her store. “The better we make it for freedom campers, the better for everyone.”

“Well, I don’t like ’em,” said Mr Jenkins. “They don’t stay at my campground. And now you’re asking the council to use our rates to give them services for free.”

“There will always be people who travel on the cheap,” said Dad. “Or people who don’t like campgrounds.”

At that moment, the hippy girls came in. Everyone stopped talking.

“Are we interrupting?” one of them asked.

“No, no,” Dad reassured them, standing back to let them through.

“Could we have two orange choc-chip ice creams, please?” asked tangle-hair. “And,” she hesitated, “do you sell toilet paper?”

It turned out the toilets on the beachfront had run out. Dad was quick to point out the council’s shortcomings again. “We pay our rates,” he said, “and what do we get for them?” Everyone nodded. One way to get people to agree, I realised, was to blame the ones who weren’t there.

A few days later, Dad and I visited the reserve with a couple of rubbish bags. Dad had phoned the council and been told someone would collect the rubbish next week. “If you want something doing, do it yourself,” he humphed. The hippy girls’ van had gone, I noticed sadly. The fish and chips I said I ate with my friends? That was actually just Dad and me.

We went to the overflowing bin, and I held open a bag while Dad donned gloves and began scooping rubbish and dropping it in. Clifford bounded up, looking pleased with himself, followed shortly by Mrs Dooley, carrying a heavy looking doggy-doo bag.

“Good on you,” she said, possibly to Clifford.

“Could you take a photo of us?” asked Dad. “I want to guilt-trip the council.”

I posed holding a rubbish bag and my nose.

The following morning, I decided to have a swim in the reserve. Oddly, the back lawn was strewn with the garden tools and junk Dad normally kept in the old outhouse, and from which I could hear grunting and sloshing. I peered cautiously in. Dad, shirtless, was kneeling with his head against the smeary seat, one arm contorted far into the bowl. “There’s a lot going on here,” he began as I hurriedly withdrew.

I kept walking, out the back gate and across the reserve to the river. To my surprise, the two hippy girls were bobbing languidly in my favourite swimming hole.

“Hi there,” called tangle-hair. “Come on in. It’s delicious.”

“I thought you’d left,” I said, smiling.

“No. Mr Jenkins offered us a free site at the campground in return for cleaning work. It looks like we’re here for the summer. We have toilets and everything!”

My mood lifted. “Nice,” I said and jumped in, letting the fresh river water wash over me.

The three of us ran into Dad and Mr Jenkins at the store. Dad was explaining how he’d unblocked our old sewer pipe and was planning on making our outhouse available to campers until the council built a toilet or allowed them to stay at the beachfront.

"That's so kind," said tangle-hair.

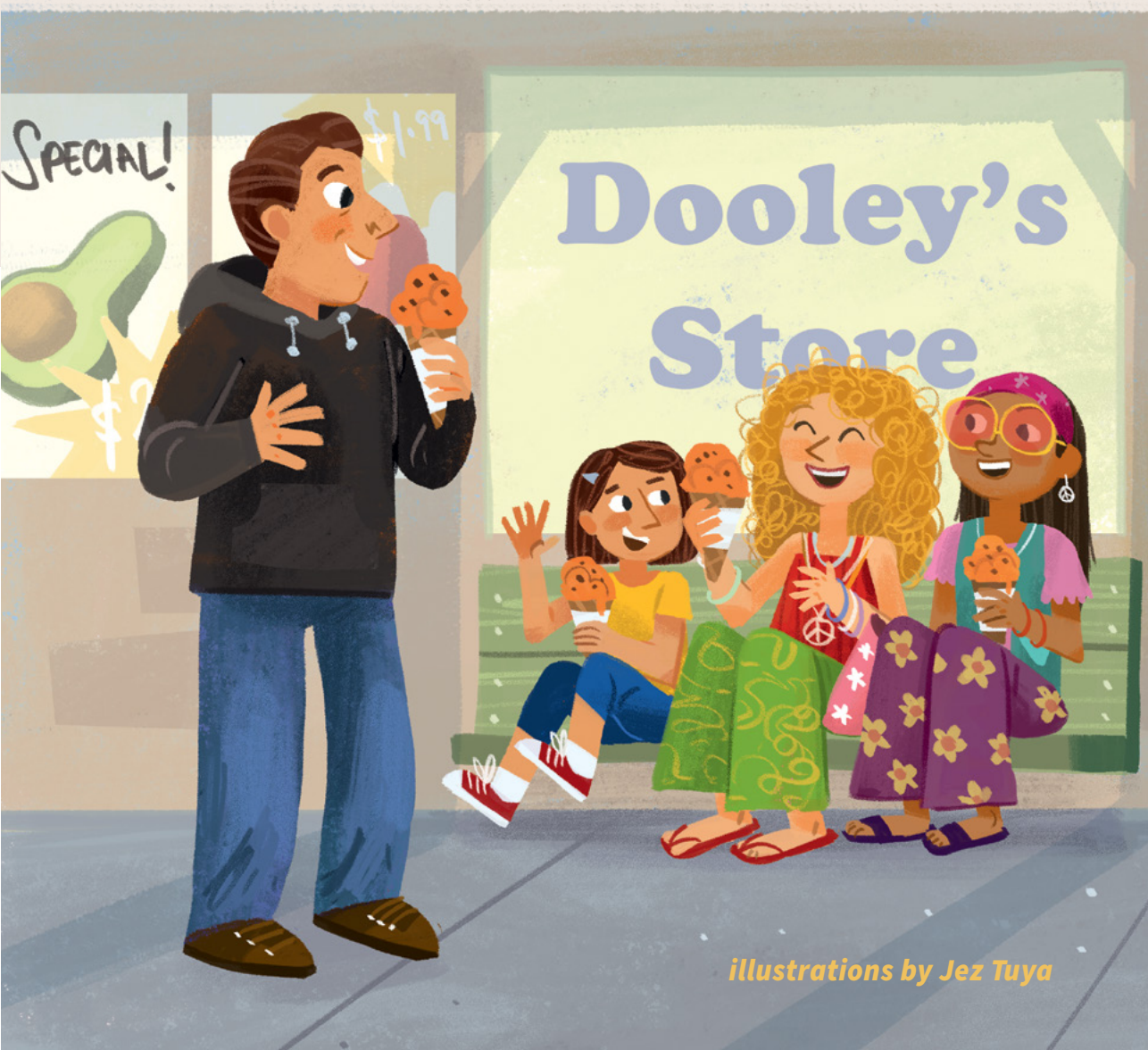
"You'll still have to clean it," said Mr Jenkins. "I've had to get in help," he added, indicating the hippy girls.

"I could do it," I said.

"I'll pay you," beamed Dad. "Orange choc-chip all round," he said to Mrs Dooley. "Where are you both from?" he asked the hippy girls. "Wait, let me guess ... the Netherlands!"

"Auckland," they chorused.

"As I thought," he nodded, "somewhere overseas."



illustrations by Jez Tuya

LEFTOVERS FOR BREAKFAST

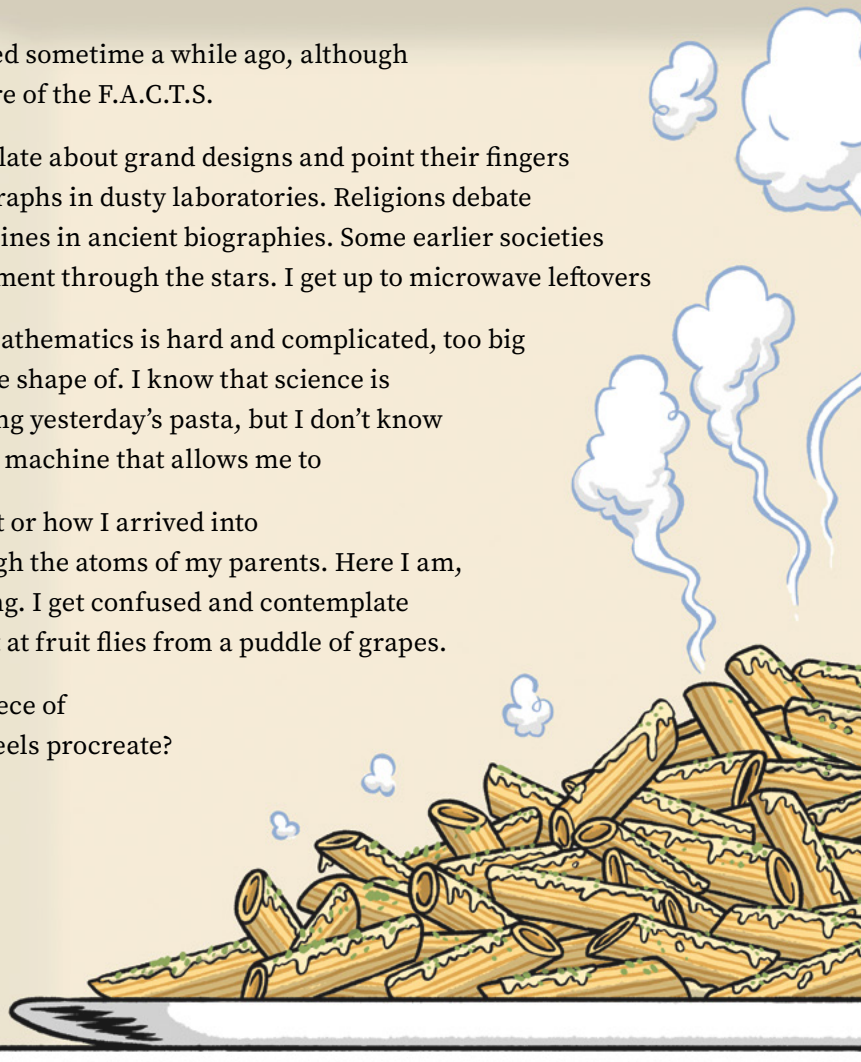
The world started sometime a while ago, although
I'm not quite sure of the F.A.C.T.S.

Scientists speculate about grand designs and point their fingers
at chalkboard graphs in dusty laboratories. Religions debate
and argue over lines in ancient biographies. Some earlier societies
predicted movement through the stars. I get up to microwave leftovers

for breakfast. Mathematics is hard and complicated, too big
for me to feel the shape of. I know that science is
how I'm reheating yesterday's pasta, but I don't know
how they built a machine that allows me to

eat cold food hot or how I arrived into
existence through the atoms of my parents. Here I am,
suddenly existing. I get confused and contemplate
Buddhism. Swat at fruit flies from a puddle of grapes.

How long is a piece of
string? How do eels procreate?



I imagine the universe begins with a
pathetic whine
about not wanting to get out of bed

and some universe's older universe appears out of nowhere
to say *you have to go outside, the sun is shining, look
at all of the billions of bio-organisms being created*.

We all contain micro-societies. The germs that live in me
hold local-body elections. My gut bacteria riots at the school canteen.
It's best not to think too hard about who's in charge of anything.

The Milky Way wonders if anyone else knows where it came from.

I yawn, pierce some penne with my miniature metal trident,
and watch a flock of scavenger pigeons shuffle their feathers in response.

Vanessa Mei Crofskey

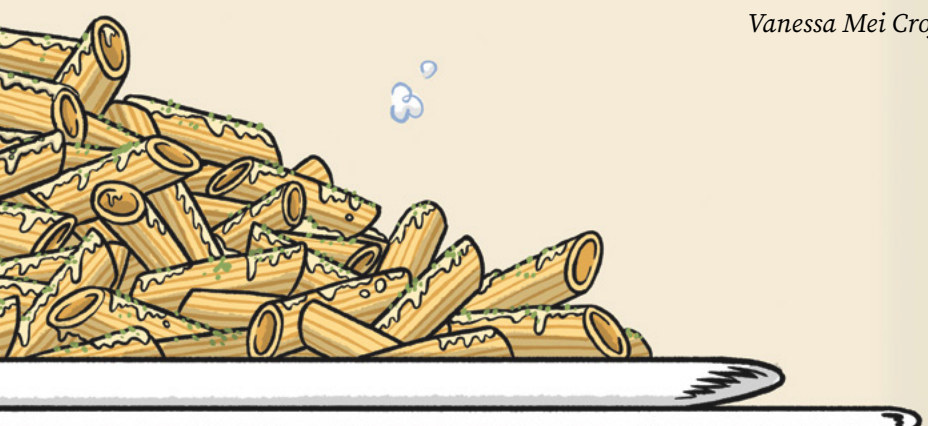


ILLUSTRATION BY TOBY MORRIS

HUMPHREY HANLEY

Life on the Upside

by Sarah Connor

Imagine if you couldn't dress yourself or pack your own school bag. Imagine losing skin every time you bumped into something – or starting each day having your limbs wrapped in bandages.

Humphrey Hanley lives with a rare skin condition called epidermolysis bullosa (EB). From the moment he was born, it was obvious something was wrong. Skin was missing on his feet. Google wasn't around in 1982, so Humphrey's parents couldn't do their own research. "It was my grandfather who finally worked it out," Humphrey explains. "He was a pathologist – a doctor who studies and diagnoses diseases."

For some people, EB is a bit like mild eczema. But for Humphrey, the disease is more severe. Any kind of friction or bump can make his skin blister. Humphrey puts it another way. "If you think of most people's skin as being attached with glue and staples, mine is stuck on with butter." EB is genetic. It can be inherited in different ways. Humphrey's parents aren't affected by the disease, but both of them carry the gene. They had a 25 percent chance of passing that gene on to Humphrey.

EB

Epidermolysis bullosa (*ep-ih-dur-MOL-uh-sis buhl-LOE-sah*) has been called the worst disease you've never heard of. Worldwide, EB affects around half a million people, which makes it rare. In New Zealand, around 150 people live with the condition. EB causes fragile, blistering skin, especially on the hands and feet. In severe cases, these blisters also form inside the body.

Some people with EB only live for a few weeks, months, or years. Most people don't live past their mid-twenties. There is no treatment or cure, but there are lots of ways people can manage their pain, treat their wounds, and protect their skin.

Up for anything

Humphrey was born with hands, but over time, his fingers fused together. Eventually, he says, his hands just disappeared. Now, with only a tiny part of one thumb left, he can't do simple things like have a shower or cook meals. Humphrey's partner, friends, and parents support him in different ways, and every morning, nurses come to his house to help him shower and dress his wounds – a process that takes up to four hours. "My day starts when most people are stopping for morning tea!" Humphrey says.

One of the main challenges of having EB is the way it eats up time. Humphrey's intense morning routine means fewer hours for work and play, but once he gets going, life is good. Ironically, getting help allows him to be independent. "It means I can get on with what I want to do, live the kind of life I want." While Humphrey's constantly weighing up any risks – and some days "don't go brilliantly" – he doesn't let EB limit him. "I'll give anything a go."

Problems have solutions

New Zealanders are famous for their "can do" attitude, and Humphrey appreciates this outlook. He remembers being at school and wanting to snowboard with his friends, so he wrapped himself in layers of puffer jackets. Looking back, he says it was a great moment (but probably terrifying for his parents). Photography, another interest, also came with an obvious problem. Humphrey solved it by attaching his camera to his arm using cable ties.

Being inventive, and making do with things like cable ties, has its place. So does technology. Humphrey says it's given him a lot of opportunities. He was one of the first in his class to have a computer, and from a young age, he was drawn to online gaming. The first touch screens were great for Humphrey, but over time, he says gaming has become faster. Gamers need to use multiple buttons – too many for someone without hands.

Humphrey was quick to take on this problem. Together with a friend, he used a 3D printer to make a plastic shell for his mouse. The shell contains magnets to help Humphrey move the cursor, and a Velcro strap helps the shell stay connected to his wrist. The designer mouse is still a prototype, but Humphrey would love to see it mass-produced. In the meantime, he helps tech companies with their user-testing. "Sharing my ideas with designers helps them make products that are more accessible for people like me." Humphrey also works as a videographer and runs his own business.

Looking for the upside

Most people are either confused or fascinated by Humphrey's skin. When he was younger, bullying was a problem. "It was tough back then for kids who were different. It feels better these days. Kids seem more inclusive and are generally nicer to each other." These days, Humphrey says, people go out of their way to help. The barista at his local cafe knows to make his coffee lukewarm – it's safer. Shop assistants avoid using tape, which he won't be able to peel off, and Humphrey can order taxis with a driver who's prepared to help. His friends are thoughtful, too. In a crowd, they always stick close – like a human bumper bar – so he doesn't get hurt.

Humphrey reckons Covid has also made a difference. "Everyone knows about learning and working from home now. It's the new normal, which is good for people like me. The pandemic has given people with disabilities a louder voice."

Working to make a difference

Humphrey didn't grow up with any disabled heroes, but now he sees trailblazers everywhere, especially in online communities. Humphrey's a big fan of Steve Spohn from the charity AbleGamers. Spohn uses gaming to reduce social isolation and to support people with disabilities.

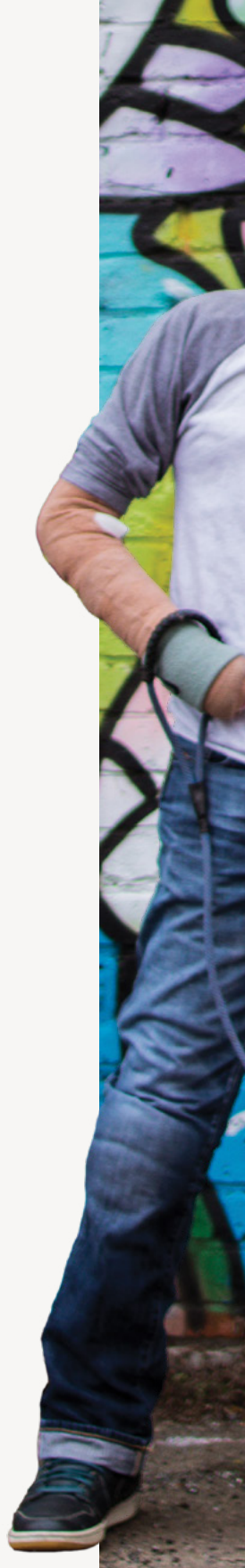
Humphrey's determined to be a role model himself. He has always spoken up for people with disabilities, and he's made loads of videos to share online and inspire others. He also ran for his local council. "One in four New Zealanders is disabled, yet I noticed no one on the council identified as disabled." Humphrey campaigned for a city that was more people-friendly, with better disability access. He also wanted greener public transport. He missed out on becoming a councillor but is now on Wellington's Accessibility Advisory Group. "I want to give disabled people a voice so they can live their best life," he says.

More recently, Humphrey became the vice-president of DEBRA International, a charity that helps people around the world living with EB. Humphrey feels lucky to live in New Zealand. "I know I can always get the care and things I need."

Being yourself

There was a time when Humphrey was sensitive about his disability defining him. He spent a lot of time on the internet, a place where difference couldn't be seen. "I liked that I could just be myself," he remembers. Now, Humphrey sees EB as part of who he is – and not something he needs to keep hidden. He says it's up to individuals to define what their disability means. "No one should feel pressured to do things a certain way – there's no right or wrong. Disabled people need space to discover who they are."

Humphrey has also learnt to accept there are some things he can't do, like backpacking. "It's not the safest way for me to travel," he says. But because of EB, he's been a guest speaker all over the world. "I've stayed in nice places and met interesting people. I've shaken hands with Prince William and been on the same poster as Ryan Reynolds!"



Advice from Humphrey

Life doesn't always go to plan. Sometimes you might want to make a change that feels impossible. Other days, life just feels hard. Humphrey's attitude is proof that challenges can be turned around.

1. Find one thing in every day that makes it worth being awake.
2. Have a vision and find a way to make it happen. Focus on how you can do what you want to do. If something you need isn't available, try making it yourself. Or find people to help you make it.
3. Imagine that opportunities are endless. Be prepared to embrace your difference and say yes to new ideas.
4. Find a way to tell your story, to support yourself and others. Most of all, be kind.

After the First Rain

by Anna Smaill

After the first rain, everything changed. That night – when we heard the giant crack of the rain machine shooting its flares into the bone-dry sky and the heavens open – it was like one huge party.

Light after light in all the houses blinked on. People came out wearing their morning faces to gaze up at the sky. They put their hands and tongues out to the rain. Even though it was a party, it was private too, like everyone had gone deep inside themselves. I only learnt how deep the dust had got in my skin when the rain washed it off.

I had thought the earth would drink it in. But by the following day, our terraces had turned into a slick of ochre-coloured mud – like when a fly settles on a horse's neck and it shivers to shake the fly off. The earth shivered the mud off, and the retaining walls were swept away, the seedlings with them.

In the days after, I walked with Gran along the road, and she pointed out the erosion. New words: *entrainment*, *deposition*. She was full of excitement as she tested me, quizzed me, like usual. She was walking slower.

Two things happened next. One was quick. The other not so quick.

The first was that people from the government came for the rain machine. Early one day, they transported the contraption and the rolled-up blueprints and a whole lot of materials. It was quite the procession. The bucket man went, too, and he waved regally from his seat in the back.

In the months after, gossip drifted back from the city. Prototypes. A new research facility. People buzzed. And as if to show they were right, there was rain in the north, clouds of different sizes and textures like the news floating back to us.

The second thing was Gran dying. At first, it was so slow you could pretend it wasn't happening. I thought we'd have all the time in the world. I wanted her to keep teaching me everything she knew, from cell mitosis to isobars. But in the end, she had just a small amount of herself left. Just enough to sit, and then just enough to lie in bed, and then just enough to breathe. Then not even that. We were all left behind.

After Gran died, my family treated me like I was going to break. I wanted to do it for real. I wanted to take the science textbooks Gran and I had studied together and rip out the pages. They had no meaning now. There was no one else who knew what she knew.

What I did instead was work. I helped rebuild the retaining walls. We used old windows from the tip to make a greenhouse for new crops. I didn't come home covered in dust any more. It was all mud. Work felt like pressing a bruise; it gave a dull sort of satisfaction. That was how it went for five months, maybe six. Digging, mud, trips to the reservoir, and that dull slow ache that never went away.

One morning – it must have been early summer because we were planting beans – I was leaving for the reservoir. I went less often now. Because of the rain, the tanks were usually at least half-full. Mum came and swung two extra drums up into the cart.

"What are they for?" I asked.

She moved her head to indicate the southern ridge where the bucket man used to live, where he and Gran had built the rain machine together.

"He's back. He'll be wanting his delivery."

I couldn't help it. I thought about the night I told Gran about the bucket man building his crazy contraption on the hill, the one based on her design. The way light came into her eyes.

I waited as long as I could. I took the slow route home from the reservoir, but I couldn't put it off forever. I walked up the same path, knocked at the same door.

The flat land out the back was empty. The front room was dark, the windows open. I went in.

The bucket man was sitting at the end of the room. There were books everywhere, the stacks as high as me, and lots of equipment. Bunsen burners. A microscope. Other stuff I recognised from Gran's lessons. I felt strange. I could hardly breathe. There was something sharp inside my chest, a bright point.

The bucket man turned and flicked on a light. I blinked.

"You're a lot muddier than when I saw you last," he said.

I felt a surge of anger. He was laughing at me. He was alive and Gran wasn't.

"I put the water out front," I said. My face twisted in a way I couldn't stop. I turned, walked towards the door.

"Hold on," he said. "Why are you going?"

I turned back. I didn't have time for this. I'd done the delivery and wanted to leave.

"I've got work to do," I said.

"What kind of work?"

"On the terraces," I said.

He looked at me steadily, with blue eyes like the sky.

"You're her grandson," he said.

Maybe he'd gone a bit crazy in the city.

"Yes."

"She told me about you."

"Why didn't you stay in the city?" I asked. "Don't they need your expertise on cloud seeding? On Gran's machine. Aren't you famous now you've solved all our problems?"

He shook his head, slowly. "You think the rain machine did that?"

I shrugged. "Of course. Everyone does."

He let his breath out slowly. "They wanted to look at it. The technology is promising. But cloud seeding is nothing new, and a single machine can't undo decades of human devastation."

"But the rains are back," I said.

"The weather changes all the time. Your gran knew that. She was always watching. We seized the right moment. But we need a better solution. Bigger ideas."

"What's the point of any of it, then?" I asked. "Gran's dead. The rain machine won't save us. I need to do the planting." I started to leave again.

"You asked me why I didn't stay in the city," said the bucket man.

I waited for him to go on.

"You," he said. "You were the reason. It was important to your gran that I knew, that I saw what she saw. She downplayed it at first."

"I don't know what you're talking about," I said.

"'Jack has a brain on him.' That's what she said. Anyone could see how excited she was. By you, your curiosity. She said she'd never met anyone so hungry to learn. Why else did she spend all that time teaching you?"

I closed my eyes. I didn't want to see him. "So?" I said.

"So," he said. "Your gran is dead, and I'm sorry. In a few years, I'll be gone, too. Your gran stayed with you as long as she could. She needed to know someone would keep her knowledge alive. That's you, son – and that's why I'm back. It's not for my sake. Or for your gran's. Or even for yours. It's because of this …" He gestured to the window, to the green hills, to the sky and whatever was beyond. "If there's no one to carry that knowledge, we might lose it. We need all the brains on the problem we can get."

I stared at the bucket man. I'd always thought of him as a crazy old man, but his eyes were clear and steady. I stayed as still as I could. Perhaps because something was happening inside me. It was like salt or the moment the rain bursts through. The sharpness was dancing in my veins, electric, right down my fingers. They were waking up from sleep. For a second, I had a crazy thought – it's Gran's knowledge. The gift she shared with me. It's waking up, tingling, coming back to life.

And I heard her voice. She'd never once said anything about me to my face. But I heard her talking now, in her own wry tone. It was more than an echo – it was so real. "Jack has a brain on him."

A brain on him. I felt warmth go right through me, a small flame of it. A guardian, I thought. I don't know where the word came from. But I knew it was right. I knew the bucket man was right.

I turned slowly as if I was still considering.

The night sky stretched out and with it, all the things I didn't know, all the things I still had to learn.

I nodded. "OK," I said. And then I said it again. "When do we start?"

illustrations by E. Logan

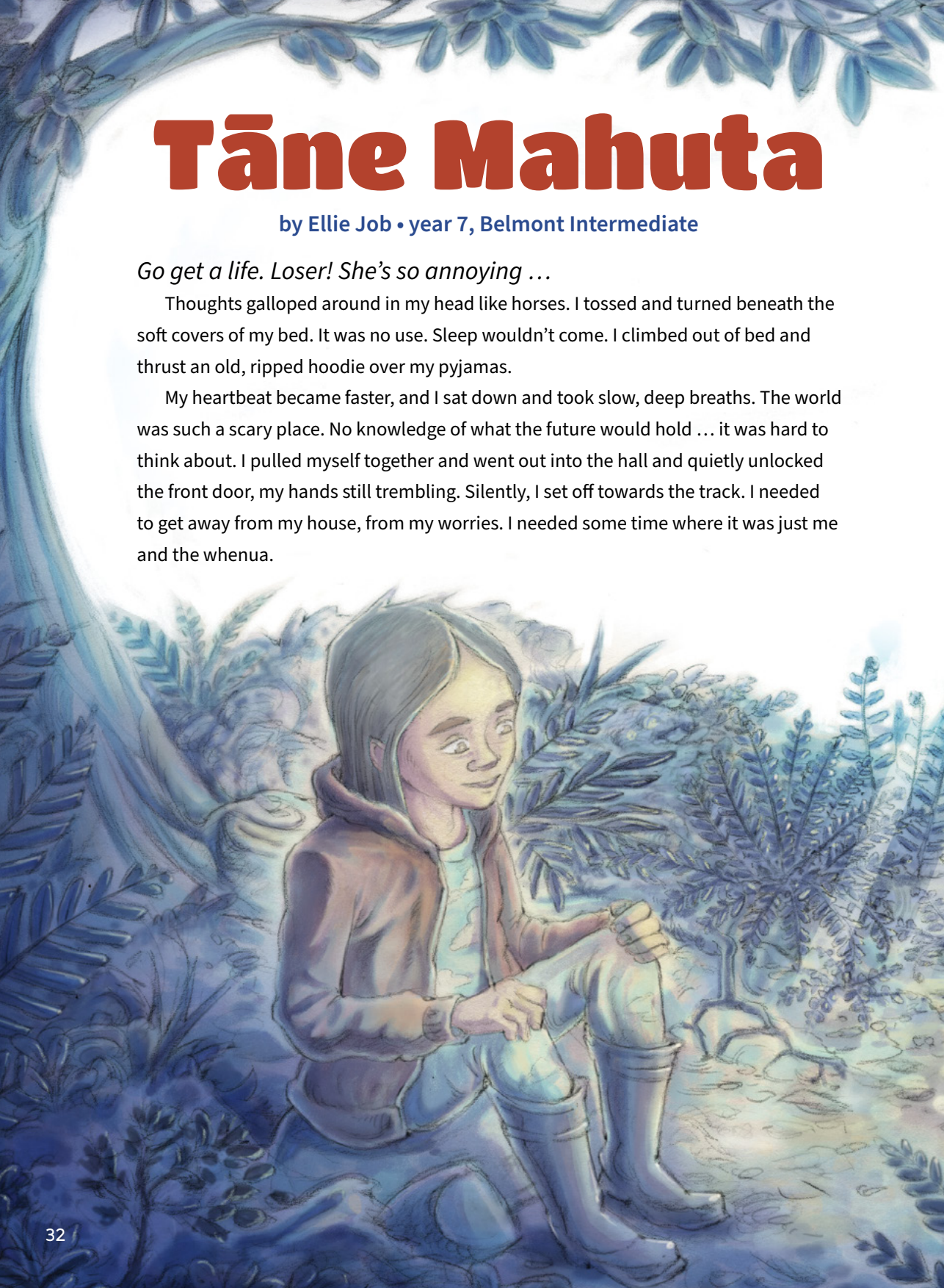
Tāne Mahuta

by Ellie Job • year 7, Belmont Intermediate

Go get a life. Loser! She's so annoying …

Thoughts galloped around in my head like horses. I tossed and turned beneath the soft covers of my bed. It was no use. Sleep wouldn't come. I climbed out of bed and thrust an old, ripped hoodie over my pyjamas.

My heartbeat became faster, and I sat down and took slow, deep breaths. The world was such a scary place. No knowledge of what the future would hold … it was hard to think about. I pulled myself together and went out into the hall and quietly unlocked the front door, my hands still trembling. Silently, I set off towards the track. I needed to get away from my house, from my worries. I needed some time where it was just me and the whenua.



I found a spot to sit quietly and think. The chilly breeze rattled the leaves. Suddenly, I heard a rustle. It came closer. I held my breath in fright. As the mysterious creature emerged from the green wonderland, I gasped. It was a kiwi! Its feathers were brown, and its sleek beak shone in the moonlight as it moved along the midnight-black ground. The bird's beady eyes darted about its surroundings. Slowly but surely, it spotted me – but it didn't run away. It stayed, peering at me thoughtfully, wondering how on earth I'd ended up in its never-ending territory.

After a while, the kiwi got bored. It started pecking at the dirt. I watched it gobble a squirming worm and then go on its way. A light trickle of rain began to fall. Time to go. I hurried back down the track and out of the bush. As I passed the river, I could hear the water's quiet flow. The sound soothed my overwhelmed mind. I trudged home, feeling a lot calmer than I had before my little journey. Sleepy, even.

As soon as I got home, I fell into bed and drifted into a peaceful, much-needed sleep. My dreams were filled with visions of the kiwi, moving about, gobbling up my worries as if they were wriggling worms.

illustration by Kieran Rynhart

How Vaccines Work

by Matt Boucher

At different times in your life, most doctors will recommend that you get a vaccine. You might have received your first when you were only a few months old. Vaccines protect us from infectious diseases. Some of these diseases might make you feel unwell for a few days; others are deadly.

Infectious Disease

An infectious disease is a set of symptoms caused by **micro-organisms** such as bacteria and viruses. (A non-infectious disease, such as asthma, is caused by a person's environment, diet, lifestyle, or genes they inherit from their parents.) Micro-organisms are found all around us. Some even live on or in us. Normally they're harmless, but under certain conditions, they can cause disease. Then we call them **pathogens**.

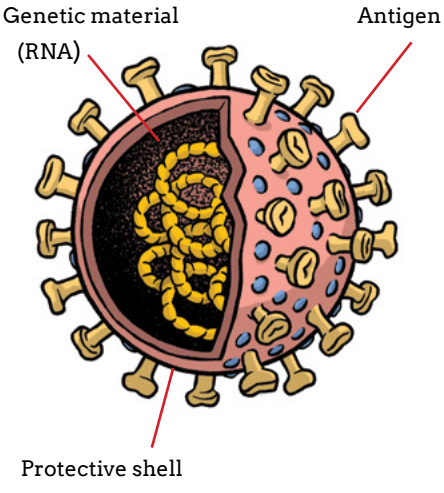
Many of the more common infectious diseases, including colds and chicken pox, are caused by a virus, and we all know about COVID-19 and its later **variants**. These viral super-spreaders resulted in chaos, lockdowns, and millions of deaths around the world. Viruses don't eat, grow, or reproduce on their own. Instead, they find a **host** and take over …

Virus Factories

Because viruses need a living thing to survive, they've become expert colonisers of cells. Take the virus that causes COVID-19. It's made up of genetic material covered in a protective shell – but this shell has a secret weapon. It contains a special protein, called an antigen, that mimics a signal the host cell recognises, a bit like wearing a disguise. Expecting the virus is one of the usual things that's allowed to enter, the host cell opens up, and the virus moves in.

Once inside, the virus gets to work. It uses its RNA to reprogramme the host cell to become a COVID-19 factory. The now infected cell copies the virus over and over. Eventually, the virus spreads to other cells, and if enough healthy cells are infected, the host becomes sick. Their immune system will either fight off the infection – and gain immunity – or the host will stay sick for longer or even die.

A COVID-19 VIRUS



micro-organism: a living thing that can only be seen through a microscope

pathogen: a virus, bacteria, or other micro-organism that causes disease

variant: a subtype of a micro-organism, which is slightly different from the first

host: a living organism (like you) that's been invaded by a pathogen

The Immune System

Your body has an answer to infectious diseases: the immune system. This vast network is divided into two parts: the innate immune system and the adaptive immune system. These parts work separately and together to fight infection within hours of a pathogen entering your body.

Once a pathogen has made its way past your skin, your body's first line of defence is the innate immune system. Cells in the innate immune system are constantly on the lookout. If they spot anything unfamiliar, they capture it and take samples. Although innate immune cells can work quickly to stop an invasion, they aren't specialists. There are some pathogens they can't recognise, and they can only respond in a limited way.

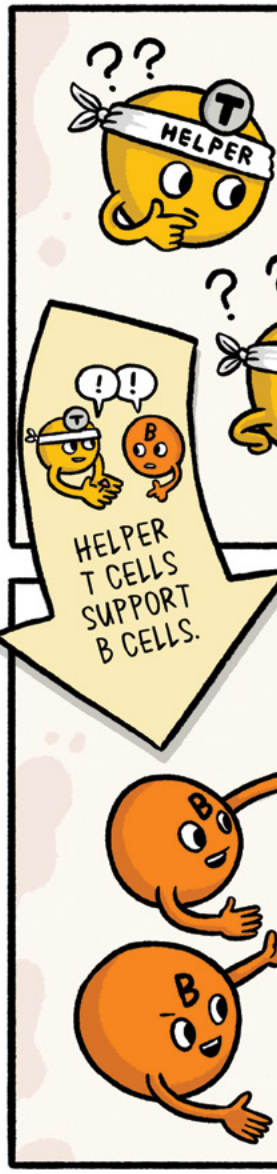
If the intruder isn't beaten back, the adaptive immune system joins the fight. The adaptive immune system contains cells that *are* specialists. Helper T cells recognise and use the samples of the pathogen's antigens to help B cells make **antibodies**, which stick to the pathogen and make it easier to target. Helper T cells also support another kind of T cell (called cytotoxic T cells) to hunt down and destroy any infected cells.

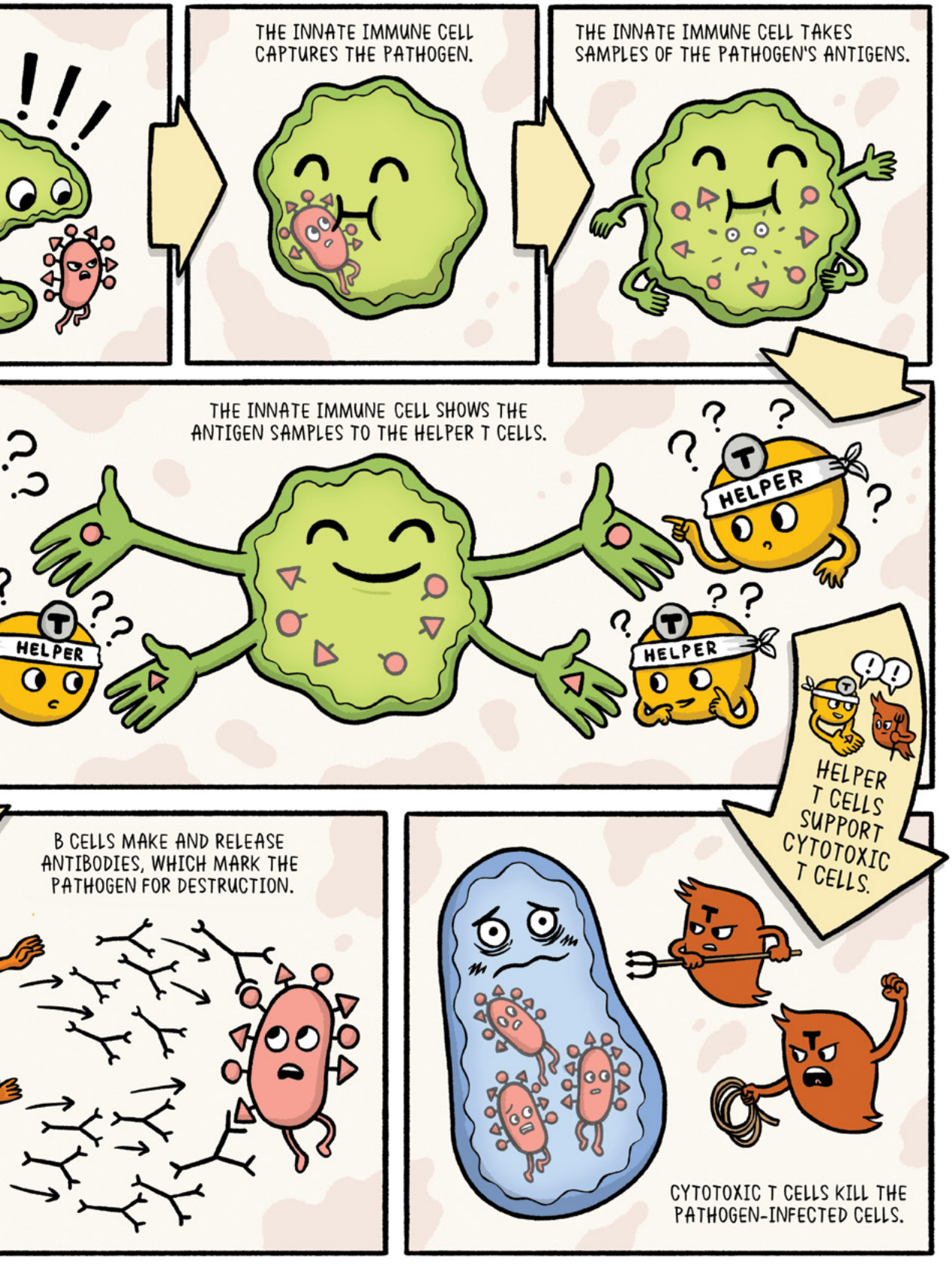
If things go to plan, the intruder is defeated, and the infected person and their immune system recover. But what if the pathogen re-attacks? To help the body stay on guard, the immune system makes **memory cells**. These stay in the body so that if the pathogen *does* return, the body will remember it and mount a more effective attack. The immune system can then work faster, the pathogen will be quickly defeated, and the person won't get as sick – if at all. We call this **immunity**.

antibody: a protein produced by the immune system to fight antigens

memory cell: a cell that stays in the body for a long time to "remember" a pathogen so it can help fight it

immunity: the ability to fight off an infectious disease




THE INNATE IMMUNE CELL CAPTURES THE PATHOGEN.
THE INNATE IMMUNE CELL TAKES SAMPLES OF THE PATHOGEN'S ANTIGENS.
THE INNATE IMMUNE CELL SHOWS THE ANTIGEN SAMPLES TO THE HELPER T CELLS.
HELPER
HELPER
HELPER
HELPER T CELLS SUPPORT CYTOTOXIC T CELLS.
B CELLS MAKE AND RELEASE ANTIBODIES, WHICH MARK THE PATHOGEN FOR DESTRUCTION.
CYTOTOXIC T CELLS KILL THE PATHOGEN-INFECTED CELLS.

Training Your Immune System

Getting sick and recovering is one way to gain immunity. But it can be an unpleasant (and sometimes dangerous) experience. Luckily, scientists have found a much safer way to help your immune system deal with infectious diseases: vaccines. These train your body to fight off a pathogen quickly and effectively before it has the chance to take hold and make you sick – or spread to others.

A vaccine works by showing a pathogen's antigens to your immune system. This can be done in different ways. Some vaccines contain the dead or weakened pathogen; others contain just the pathogen's antigens. But a newer kind of vaccine uses a code called mRNA. This code tells your body to make copies of the antigens in order to train the immune system. In all of these cases, the immune system remembers this information and uses it to respond to an attack.

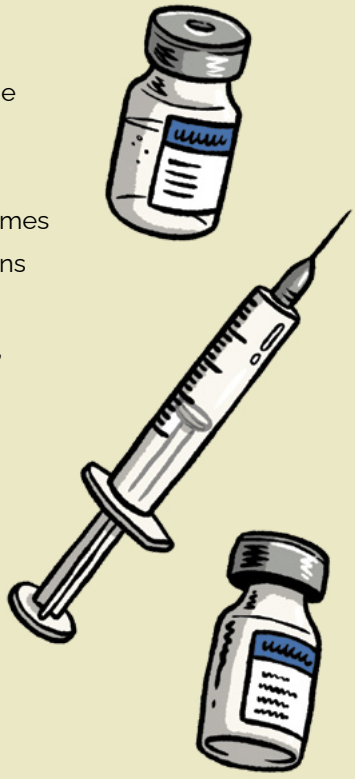
Memory cells can fade over time, especially with certain diseases. That's why some vaccines have a second or third dose – and even a booster shot. These vaccines keep your immune system trained and ready at all times.

Variants and Vaccines

Infectious diseases are often changing. We all know about the many faces of COVID-19 (including Delta and Omicron), and each winter, there always seems to be a different kind of flu.

Because all pathogens replicate themselves, they sometimes mutate. A mutation is a chance event (or mistake) that happens when genetic material is copied. Some mutations give a pathogen an advantage, and if that advantage is big enough, the mutation will take over and become a new variant.

A new variant can be good news for a pathogen. Sometimes, a vaccine won't work as well against it; other times, it won't work at all. Scientists keep a close eye on the most common and trickiest diseases so they can improve the vaccines we use to fight them, which is why we have a different vaccine for the flu each season.

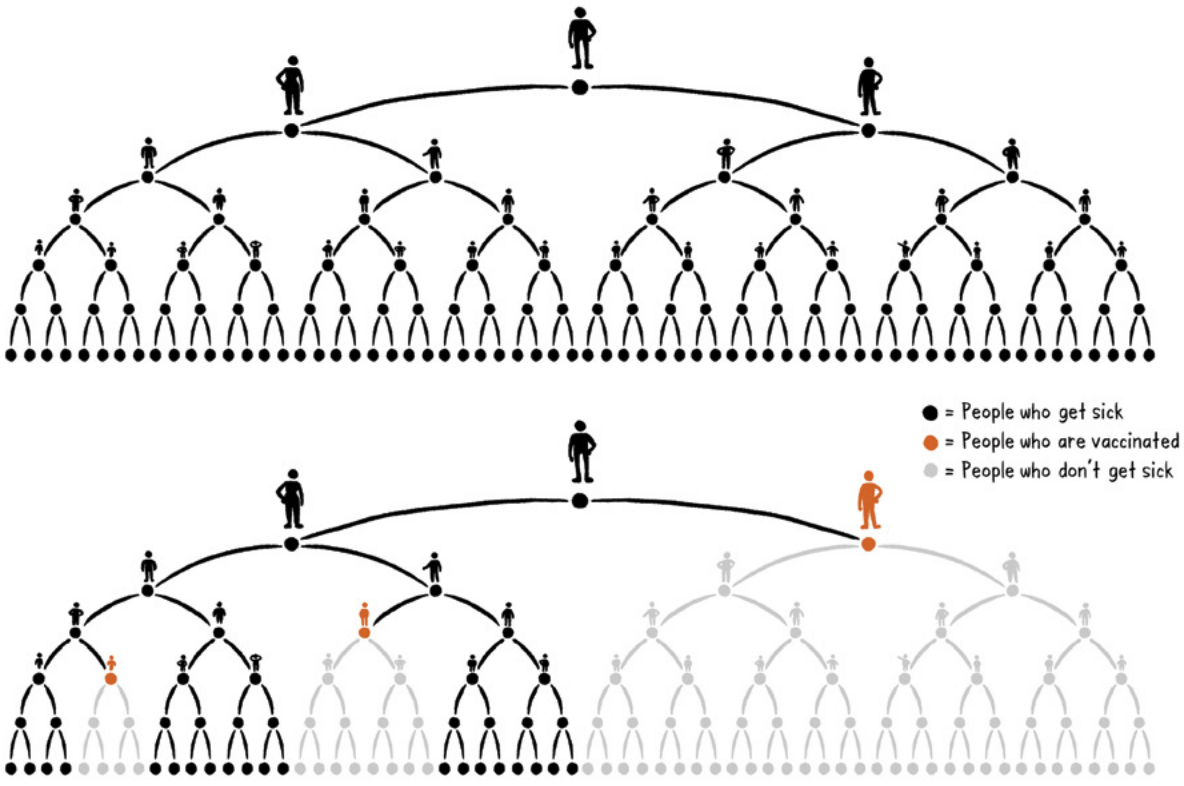


Protecting Our Communities

A vaccine doesn't protect only you. Getting vaccinated also protects the people around you because the disease has less chance to spread. If enough of us are immune, the disease can't spread at all. We call this herd immunity. Some diseases, such as polio, need 80 percent of people to be vaccinated to have herd immunity. Scientists now think that COVID-19 needs over 95 percent.

Herd immunity takes time. Sometimes, it can be difficult to achieve at all. However, the spread of infectious diseases can be slowed if enough people get vaccinated. Being vaccinated also helps protect vulnerable people in the community. Small children, the elderly, and people with health problems often have a weaker immune system, which makes it harder for them to fight disease. Other people can't be vaccinated, or a vaccine might not work as well for them. Being vaccinated helps you to care for everyone in your community.

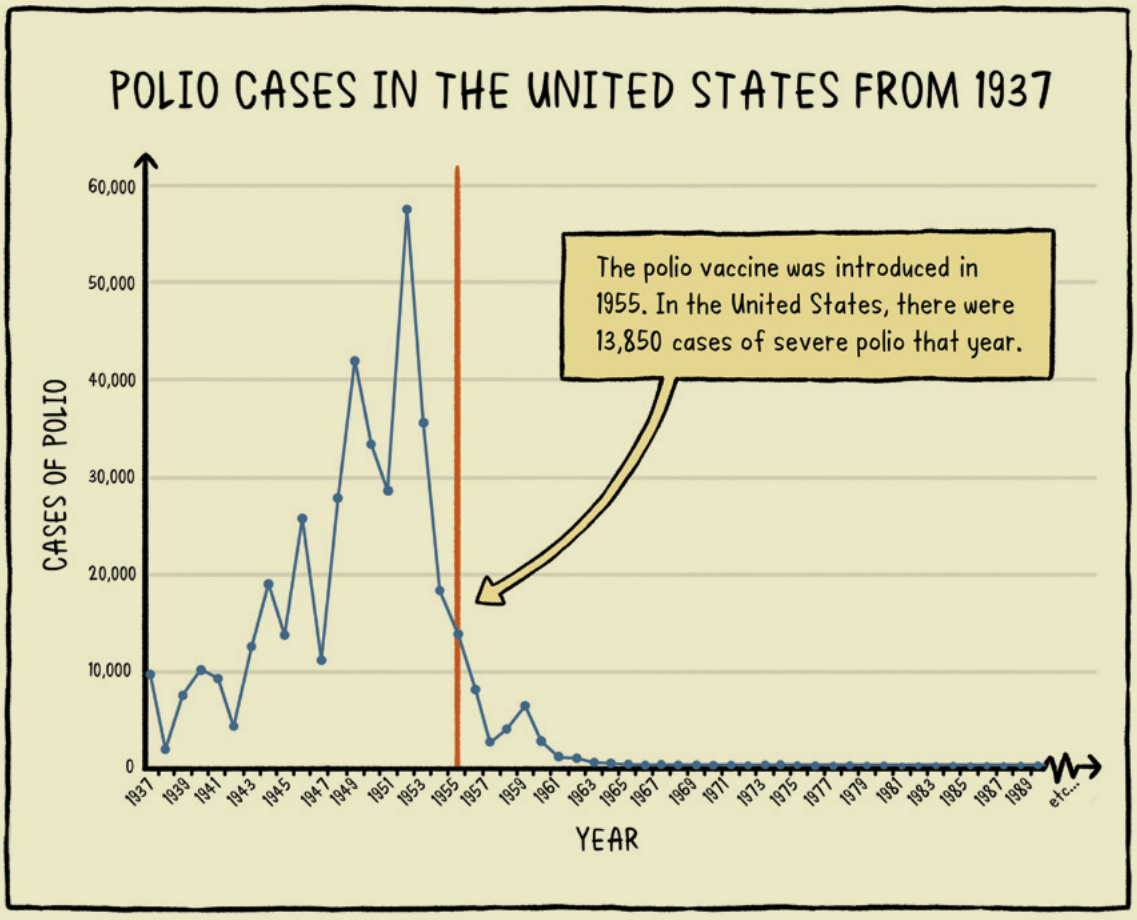
HERD IMMUNITY

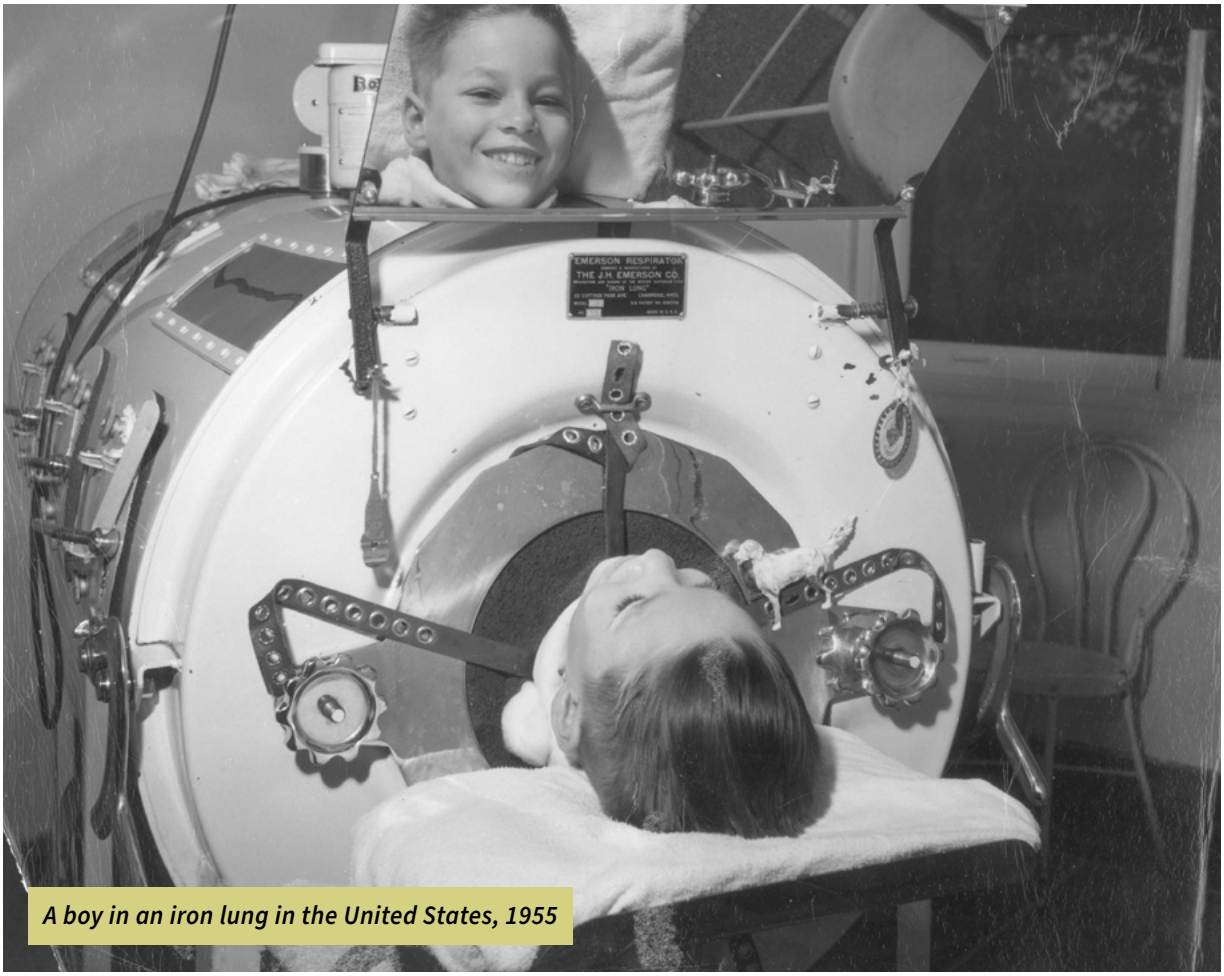


Polio: A Disease Almost Defeated

Polio was once a common infectious disease. It was spread through contaminated food and water or by contact with a person already infected with the polio virus. In severe cases, people with polio couldn't breathe on their own and had to spend time in an iron lung, a machine that breathed for them. The disease especially affected children and young people and sometimes caused permanent paralysis.

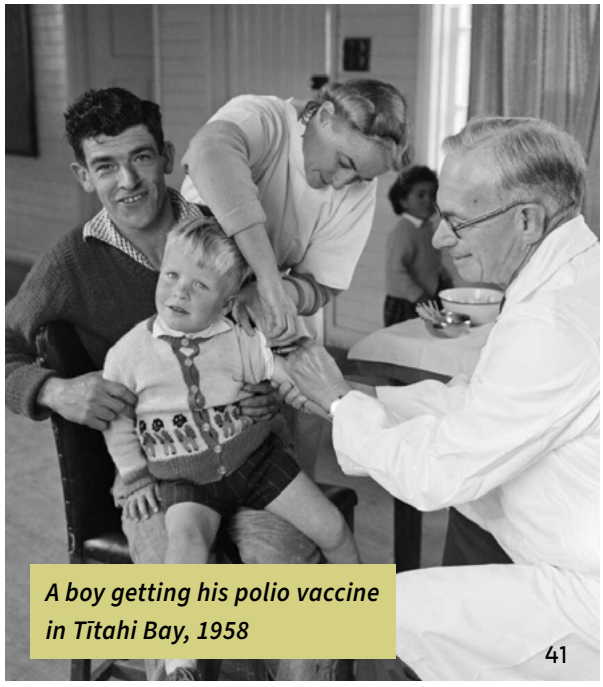
By the mid-twentieth century, the number of polio cases around the world began to fall as people got better access to good sanitation. Then in 1955, a polio vaccine was invented. In countries where many people got the vaccine, including the United States and New Zealand, the disease quickly disappeared. In 1988, the World Health Organization made it a goal to eliminate polio from the entire planet. Now, through vaccination, that goal is on track.





A boy in an iron lung in the United States, 1955

Children with polio in Auckland, 1943



A boy getting his polio vaccine in Tītahi Bay, 1958

The Box

a screenplay by Leki Jackson-Bourke

CHARACTERS: BRONNY, **SHIRLEY**, **NYSSA**, **BRIAN**, **LOLO** (*all students) and* **WHAEA CARMEL** (*a teacher*)

An empty classroom. **BRONNY** *is standing next to a box.* **SHIRLEY** *and* **NYSSA** *arrive.*

SHIRLEY (*looking around*)
Where's Whaea Carmel? No drama club today?

BRONNY
She came and then she left. Look … ta-da. Behold, the box of life.

BRONNY *proudly presents the box.*

SHIRLEY
What's in it?

BRONNY
Dunno, but I'm in charge.

NYSSA
Why aren't boxes ever like … circle shaped?

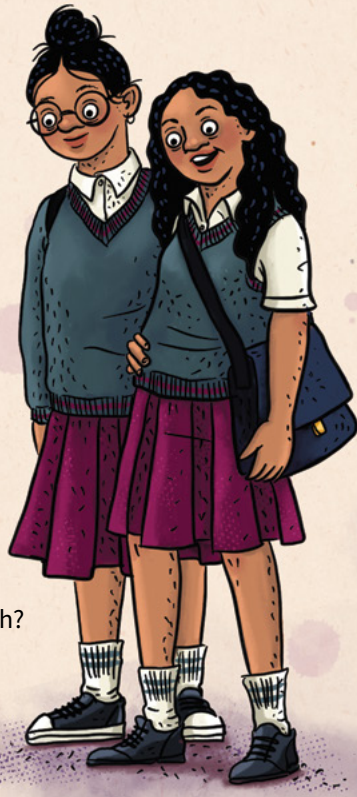
SHIRLEY
Push it here, Bronny.

BRONNY (*taking a step closer to the box*)
No!

SHIRLEY
I just want to feel how heavy it is. I might be able to tell what's inside.

NYSSA
And like … who invented boxes? They're so random, eh?

BRONNY
No, Nyssa, you're random.



SHIRLEY
Bronny, I just need it for a second. Come on.

BRONNY
No. If Whaea Carmel wanted us to look, she would've said. And I'm in charge.

SHIRLEY
You're not the boss of drama club.

BRONNY
Whaea Carmel said, "Bronny, you have to protect the box at all costs. You're the kaitiaki."

SHIRLEY (*looking sceptical*)
Really? Aren't we all kaitiaki? What makes you so special? Because you were the first one here today?

NYSSA
Even the word box? Like where did it come from – box? Box. Box. Box.

BRONNY
I'm the eldest, and the eldest is always the kaitiaki.

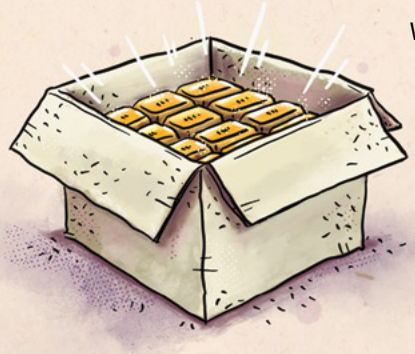
SHIRLEY
Ummm, you're older by about three weeks.

BRONNY
Exactly, so respect your elders!

NYSSA *pokes at the box with her foot.*

BRONNY
Nyssa, stop that.

NYSSA
What do you guys think is inside?



SHIRLEY
Gold.

NYSSA
Or biscuits?

SHIRLEY
Chocolate biscuits!

NYSSA *and* **SHIRLEY**
Mmm …

BRONNY
We'll find out when Whaea gets back.

NYSSA (*to Shirley*)
Are you thinking what I'm thinking?

BRONNY
We're not opening it!

SHIRLEY
Yes, we are.

NYSSA *and* **SHIRLEY** *begin to corner Bronny.* **BRIAN** *and* **LOLO** *enter.*

BRIAN
What's up?

BRONNY, **NYSSA**, *and* **SHIRLEY**
Nothing!

LOLO
I sense tension. Where's Whaea Carmel? What's in the box?

SHIRLEY (*glaring at Bronny*)
We don't know. We don't know anything!

BRIAN
Obviously. Why are you guys acting weird?

SHIRLEY
We're not. He-he.

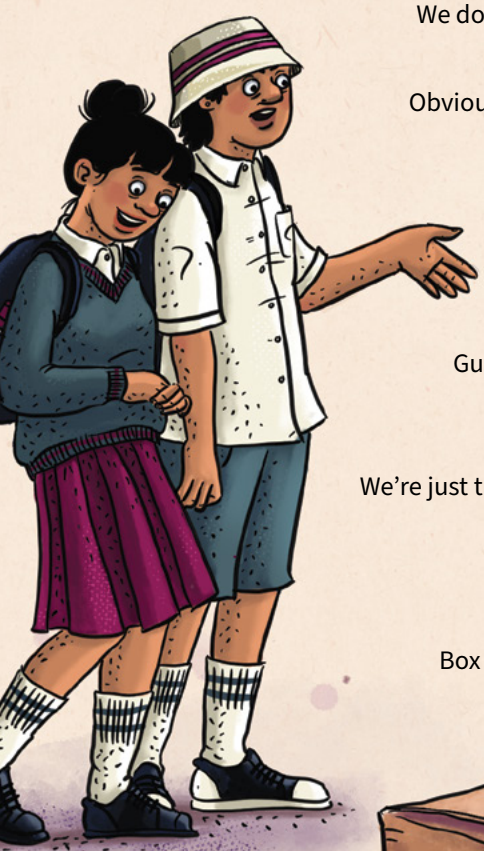
BRONNY
Yeah. He-he.

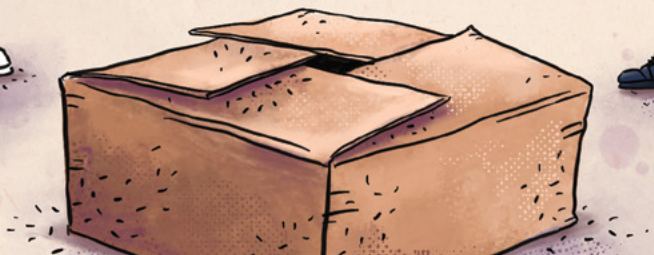
NYSSA
Guys, we're definitely acting weird
… he-he-he.

SHIRLEY
We're just trying to figure out what's inside the box.

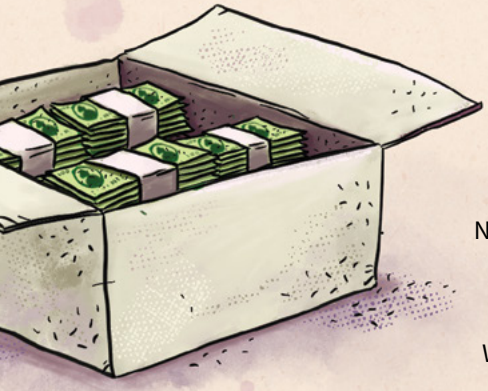
BRONNY
No, we're not.

NYSSA
Box rhymes with fox. Maybe there's a
connection? Hmmm …





BRIAN
Bro, this one time, my dad hid this box in our garage, and me and my brother found it and accidentally opened it, and it had three hundred thousand dollars in it!



SHIRLEY
Woah!

LOLO
Lies dot com Brian.

BRIAN
Nah, jokes … it was just a box of DVDs from the nineties.

SHIRLEY
Wow, your dad must be old as.

NYSSA
What else could be inside the box? Maybe a fox, maybe some rocks?

LOLO
OMG! It could be a treasure map with a skull that says X marks the spot.

SHIRLEY
How old are you? That only happens in movies.

BRIAN
What if it's a box of rats? Oi, this one time, our old house had heaps of rats, and we used to name them after all the uncles we didn't like.

LOLO
Disrespectful!

NYSSA
OMG, I love rats. They're so cute.

LOLO
Ewww!

BRIAN
But seriously, what's in the box?

BRONNY
We don't know. We're waiting till Whaea gets back.

Silence. **BRIAN** *and* **SHIRLEY** *whisper together.*

BRIAN
We think we should open it.

BRONNY

For the millionth time, we're not opening the box! I'm the kaitiaki, and I already said no.

BRIAN

Well, I'm a kaitiaki, too. My grandpa was one, so that means I'm one.

NYSSA

If I'm your friend, then can I be one, too?

BRONNY

A kaitiaki can only be chosen by an older person. Sorry, overruled.

LOLO

That's not true. You guys really don't understand how it works, do you?

SHIRLEY

I think we should vote. Let's all be kaitiaki. All in favour say āe.

SHIRLEY, **NYSSA**, **BRIAN**, *and* **LOLO**

Āe.

BRONNY

Not āe.

BRIAN

Sweet. Majority rules. So, are we gonna open the box now?

BRONNY

We can't. Whaea Carmel said not to. The box is sacred.

SHIRLEY

What? That's not what you said before.

NYSSA

Guys, maybe it is sacred. Bronny's right. We should wait.

SHIRLEY

Aww, boo-hoo. You're outnumbered.

BRIAN

Let's do it!

SHIRLEY

Let's gooo!

The group is split: **BRONNY** *and* **NYSSA** *versus* **SHIRLEY**, **BRIAN**, *and* **LOLO**. *They start to jostle one another.* **WHAEA CARMEL** *enters.*

WHAEA CARMEL

Ahh, good timing. I see things are getting interesting …


āe
āe
āe
āe
NOT āe!

BRONNY
Sorry, Whaea. I tried to stop them.

SHIRLEY
Me too.

NYSSA (*dramatically*)
They started fighting. It got real bad …

WHAEA CARMEL
Sorry, kids. I was double-booked. Mr Ririnui has Covid, and I said I'd coach the touch rugby team at lunchtime. I didn't want to let you down, so I left you a box …

BRONNY (*glaring at the others*)
You're not the one who's let people down.

SHIRLEY (*casually*)
So what's in the box, Whaea? Bronny was desperate to know.

WHAEA CARMEL
Nothing.

BRIAN
Huh!

BRONNY
Nothing?

LOLO
It's like the *opposite* of a treasure map!

NYSSA
I told you boxes were random!

WHAEA CARMEL *looks at her watch.*

WHAEA CARMEL
Oops, almost forgot. Ms Wilson's at the physio. And I said I'd coach her netball team too. Triple-booked! Right, your new task …

WHAEA CARMEL *drags a big box that no one's noticed to the centre of the room. Clearly, this one does have something in it.*

WHAEA CARMEL
No peeking. I'll be back in half an hour. And this time, you're all kaitiaki.

THE END

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