

# SCHOOL JOURNAL

## MAY 2020

TITLE	READING YEAR LEVEL
The Musician	7
The Winning Side	7
Muse	7
Game Changers	8
Feedback	8
Leaves	8
Last Match	8

This Journal supports learning across the New Zealand Curriculum at level 4. It supports literacy learning by providing opportunities for students to develop the knowledge and skills they need to meet the reading demands of the curriculum at this level. Each text has been carefully levelled in relation to these demands; its reading year level is indicated above.

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# SCHOOL JOURNAL **LEVEL 4** MAY 2020

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# The Musician

by Sarah Penwarden

It's not like Mum hadn't had boyfriends before. She had. It's just that none had moved in and none were like him.

Kayla, Sissy, and Mum were queuing for movie tickets one Saturday night when a man came up. Mum looked shy before introducing him, her eyes shining. She looked instantly younger, Kayla thought. Almost a girl. The man's name was Jed. Mum kept smiling – secret smiles, just for him.

Jed wasn't tall. He had fair hair, shaved at the back and sides and swept over his forehead, with a wispy blonde beard. He wore a red-and-black checked shirt and some kind of bracelet round his wrist – it looked like leather, Sissy said afterwards with something like disgust. A ring in his earlobe with a gap in it. Ear gauging, Mum explained later. Dark tattoos spiralled up his arms.

“Hi,” Jed said.

They stood around together, a bit awkward. Luckily Jed was going to a different movie. They didn't run into him after.

He was a musician, Mum said on the drive home. They'd met at a gig in the city. Jed played guitar in the band. They'd had a good night, and now they were dating. Sissy had raised her eyebrows at that point but said nothing. She'd liked Gary, Mum's last boyfriend, but Mum had changed her mind about him.

Soon, Jed was spending evenings at their house, sitting on the couch with Mum, playing the guitar with his long fingers. His real name was Jeremy. He was from Auckland originally but had spent years in Europe. Kayla could just see him wandering down some old, narrow street, guitar on his back, playing his music in cafes. That's where he'd learnt to cook. Most nights, he filled their kitchen with the smell of frying onions and garlic. He cooked delicious dinners: veggie curries and dhal and felafel and all kinds of food they'd never eaten before.





Dad's face screwed into a frown when Sissy told him about Jed. Kayla thought it was a bad idea to talk about it, but Sissy bowled straight on in. "Mum's got a new boyfriend," she said in a rush, "and he's a hippie."

"Hipster," Kayla corrected.

Dad frowned even more and looked away. His hands were covered in oil from fixing the ute, spare parts scattered. It was his weekend and the rugby had been rained off, so it was a day indoors. Sissy and Kayla were out in the garage, passing Dad tools.

"Do you like him?" he finally asked, pointing to a spanner.

Kayla frowned at Sissy. Sissy just shrugged. Then she asked if they could go out for dinner.



A few months later, they were eating spaghetti with Mum and watching the news. Kayla could tell she was building up to something. She was nervous.

"Girls. I have some news." Mum paused and took a big breath. "I've asked Jed to move in."

"What? Jed ... living here ... with us?" Kayla said. "You only just met!"

"Actually, we've been seeing each other for a while." Mum's cheeks had turned pink. "It's been at least six months."

"He'll be our *step*-Dad?" Sissy squeaked.

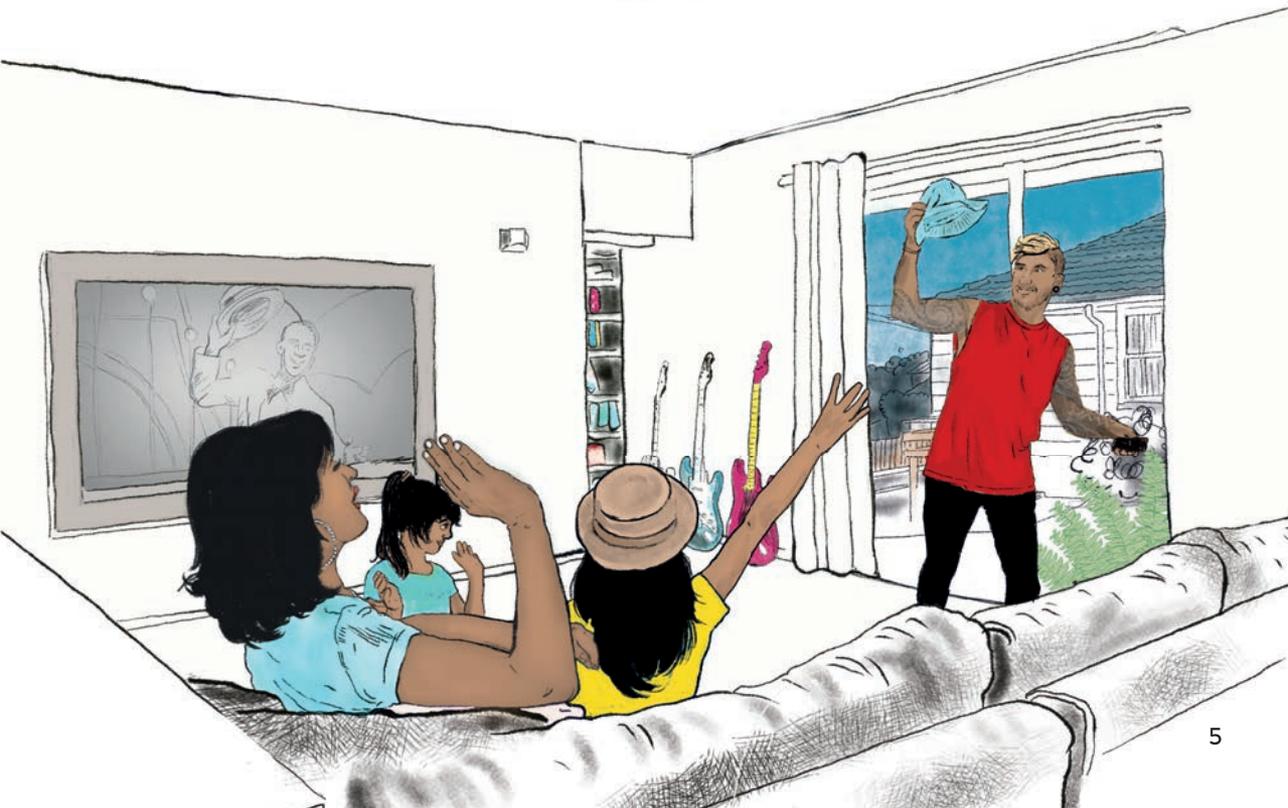
Mum winced at the word. "No, love. He's my boyfriend. No one's going to be your dad but your dad, OK?"

Sissy seemed relieved. Kayla said nothing. There was a lot to think about.

It was strange at the beginning, having a man in the house who wasn't their dad: seeing him trim his beard in the bathroom mirror, his shoes next to Mum's in the wardrobe, his three guitars resting against the wall. Sometimes, the house smelt of aftershave. It was like lemons. Mum seemed happier, Kayla thought. She was laughing again. They hadn't heard that for a while.

Sissy wasn't so sure. She and Jed didn't have much in common. Sissy liked playing netball and rugby. Drawing horses. Helping Dad with the ute. She said she didn't know what to say when Jed was around. Still, he made the house feel calmer, and he was good at maths. He helped Kayla with her homework. He especially liked algebra and wrote numbers very neatly, crossing his sevens with a dash.

They watched movies together sometimes, laughing at the same things. Jed could nail American accents, and he had a good memory. Afterwards, he'd perform entire scenes – even the long ones – doing all the voices. Kayla would laugh so hard she'd snort. There was also their connection over animals. Jed was a vegan, though he'd started out vegetarian. He decided to take it further after visiting a farm that kept chickens in cages. He'd been thirteen years old – exactly Kayla's age. Kayla talked to Mum about animals, how they should be treated. Mum said she understood, but Jed really got it.





One day, they got home from school and Jed wasn't there. This was unusual.

"Where's Jed?" Sissy asked.

"He's gone out," Mum said. "We had a fight."

"A fight?" Sissy said. "What kind of fight?"

"Just a fight."

"But what about?" Sissy asked.

"It's too complicated to explain," said Mum, her brown eyes filling.

"Is he gone for good?" said Kayla.

"He's staying with a friend for a few nights. To think things over."

"Doesn't he want to live with us any more?" Kayla asked.

"I'm not sure," Mum said. "Can we please just drop it?"



Jed did come back but only to move his stuff out. It was during the day, while they were at school. They didn't get to say goodbye. Sissy didn't seem to miss him, but Kayla did. The house was quieter and less interesting without Jed's music.

Mum didn't talk about the breakup – not to them, anyway, but Kayla heard her on the phone to Aunty Trace and caught the drift. He wasn't sure about being in a relationship; he had some stuff he needed to sort. His explanation didn't make Mum feel any better. Kayla felt sad when she heard her talking and sad to think she'd never see them sitting on the couch together or hear Jed playing funny riffs on his guitar. It was confusing when people changed their minds.

A month went by. Then, one Sunday night, they'd just got back from a weekend at Dad's, and Kayla wasn't sure if she was imagining it ... but Mum seemed a bit happier than usual. She was humming to herself, ironing, when her phone rang. She walked quickly into her bedroom to answer it. After a while, she came back, looking pleased.

"Who was that?" Kayla asked.

"Jed," Mum said quietly. There was a pause. "I bumped into him last night."

"And?" Kayla said.

"And nothing. We talked. That's all." Mum began to iron a pillowcase. It was clear she thought the conversation was over, but Kayla was sceptical. It felt like there was something Mum wasn't saying.

"Really?" Kayla said.

"I don't want to get into it, love."

Mum didn't look up. It felt like she didn't want Kayla to see her eyes. "Let's wait and see. Who knows?" Mum was being careful, but her voice went up at the end, like she was hoping for something.

Kayla sighed. "So we just wait then?"

"Yes, love."

"Did he say anything about us?"

Kayla asked.

"Yes. He said to say hello."



# GAME CHANGERS

by Clare Bardsley

Sometimes making mistakes can be a good thing, especially when it comes to creating digital technologies. The MiniDevs are a group of students who know all about this. They were part of a software-development team that worked on a project called Mixiply, a digital platform for making games and apps that use augmented and virtual reality. Then the MiniDevs used Mixiply to try to build their own game. Right from the start, the students wanted to work in their own way, not be shown what to do. If they made a mistake, they would learn by fixing it.



## LEARN WITHOUT LIMITS

The MiniDevs are based at Newlands Intermediate. They're not computer whizzes, but their teacher, Marianne Malmstrom, encourages them to be bold thinkers. She believes learning is a process that works best in authentic, real-life situations, and she's always on the lookout for one. So when she met Jim Taylor, a technologies architect, the conversation quickly turned to the idea of collaboration.

Jim works at a digital technology company called Theta. He figures out how a piece of software will need to operate and then makes it happen. A lot of his projects use augmented and virtual reality, and he was keen to explore ideas with the next generation of users. Like the students, Jim thinks outside the box. He enjoys working with kids, he says, "because they're good at challenging ideas and asking questions, which really helps the creative process. You're more likely to innovate."



## AR AND VR: WHAT'S THE DIFFERENCE?

The terms “augmented reality” (AR) and “virtual reality” (VR) often come up in the same conversation, but what’s the difference? Augmented reality starts with a live view of something, such as a street scene, then adds digital special effects. AR is most commonly associated with a tablet or smartphone. The game Pokémon GO uses AR. So do the lenses on Snapchat, which let users add 3-D features as they take a photo.

Virtual reality doesn’t add to the physical world: it shuts the physical world out and creates an entirely new digital environment. Users might find themselves in the middle of a snowstorm or wrestling an alien on the back of a flying banana. The experience is shared through a headset or special glasses.





## THINKING BIG

The MiniDevs had never used AR or VR, so Jim's first step was to introduce them to AR glasses. The students were quick to understand AR's potential and to share thoughts about what they could use it for. A game was the obvious choice – but what kind of game? After much discussion, then a vote, the MiniDevs decided they wanted to create something that was almost, but not quite, a story – a pick-a-path adventure. The player would need to figure out a series of riddles and clues.

“We were thinking big,” says Heena, one of the original members of the MiniDevs, “and big means lots of work!” The group had to consider everything, from the way they'd share ideas, to **storyboarding**, to the game's **mechanics**. One of the first things they needed to decide was who would do what.



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**storyboarding:** a visual plan for how a piece of software might work

**mechanics:** the way something works



Concept



# THE REAL WORLD

A key part of creating a game involves writing software, and writing software means coding. But the project needed more than just coders, and some students were keen to try other tasks, such as 3-D modelling. To keep everyone happy, the MiniDevs decided to replicate Theta's structure: they would have a studio team. There would be artists, developers, musicians, designers, and a communications group – as well as coders. Each student would choose a role that suited their skills, then write a job application.

Having a studio team copied what happens in the real world. The students wanted to work in a real way, too. This meant each idea would be pitched to the group, and everyone would have the chance to ask questions. Is the idea original? Will the technology let us do it?

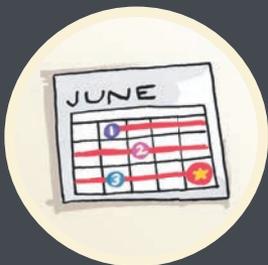


Do we have the skills? The students learnt to negotiate as ideas were refined. There was a lot of compromise. “We went in thinking ‘this is what we’re going to make’,” Heena remembers, “but we ran into problems. This meant we needed to make changes.” In the business world, this is called pivoting.

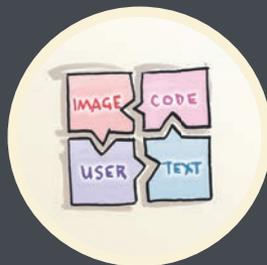
IS THE IDEA ORIGINAL? WILL THE TECHNOLOGY LET US DO IT? DO WE HAVE THE SKILLS?

## THE GAME DEVELOPMENT PROCESS

Planning



Production



Testing



Launch



# TRICKY TERRITORY

It's easy to come up with an awesome idea for a game. It's more difficult to plan that game's **story arc** and mechanics, but these things can be done on paper. Once the students moved to the production phase, life got trickier. Finding and building the game's **assets** was time-consuming, especially the coding. "Basically, everything took much longer and was much harder than we'd planned," Samuel says, "and we started to miss deadlines." As the team fell further and further behind, it became difficult to juggle the production schedule.

The students lost momentum, and this meant they also lost focus.

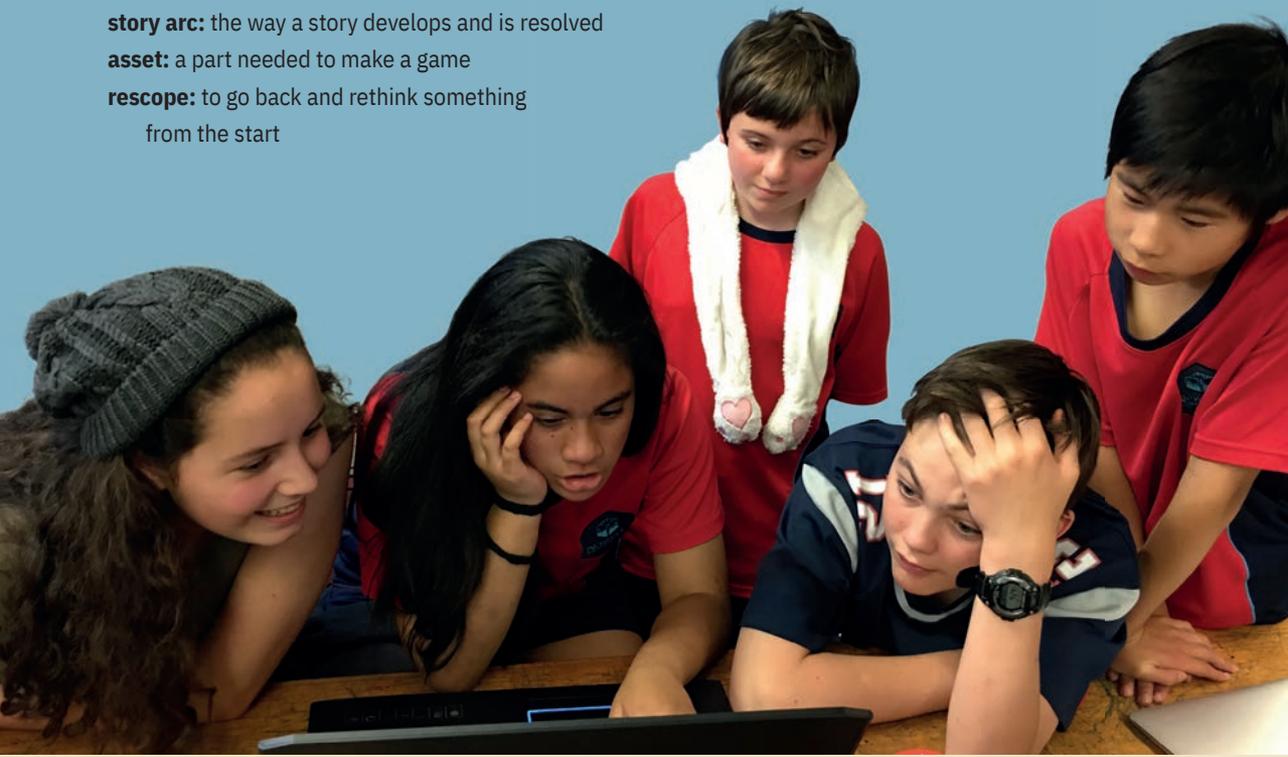
"We learnt from the experience," Samuel says. "It's great to be ambitious, but in the long run, it's better to be realistic. If things aren't working out, you need to **rescope** – and don't leave it too long!" The current team of MiniDevs has taken these lessons on board. They're now working on a series of mini-game design challenges. In other words, they're starting small. They have a simple idea, a small group of people, and a short time frame.

---

**story arc:** the way a story develops and is resolved

**asset:** a part needed to make a game

**rescope:** to go back and rethink something from the start



IT'S GREAT TO BE AMBITIOUS, BUT IN THE LONG RUN, IT'S BETTER TO BE REALISTIC.



## MIXIPLY

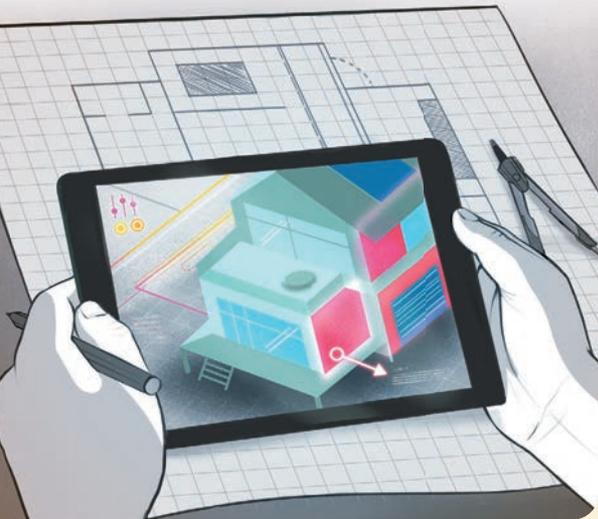
As well as working on their own project, the MiniDevs helped Theta to develop MixiPLY. This is a free piece of AR/VR software aimed at kids. Because they were part of the target audience, the students were in a good position to comment on what was working well and what wasn't. It was crucial feedback for Jim, who doesn't believe in developing new technologies in isolation. "You need first-hand input from users, especially if you want a platform to evolve and improve as much as possible."

With this in mind, Jim encouraged the students to be creative. "I really wanted them to push the platform to its limits." He didn't need to ask twice. Heena says they had lots of fun trying to crash each new version. "We wanted to explore what would happen to the program when we made a change." The students could experiment in any way they wanted, which meant lots of funny moments. "Like the time we created hordes of zombies to crash the game," Heena says.

## HELPFUL REALITY

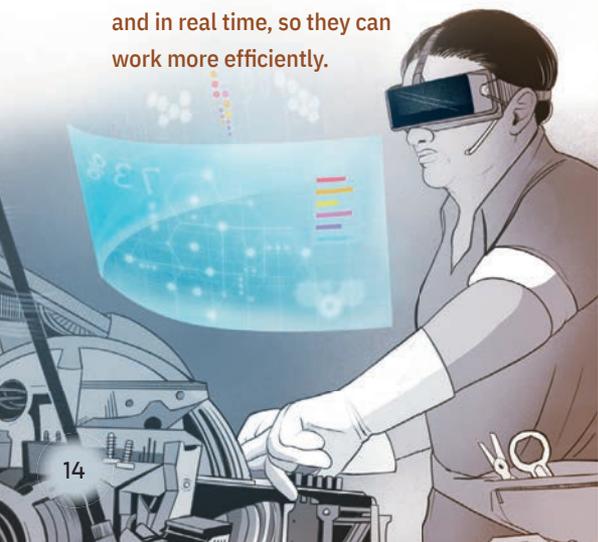
How are augmented reality headsets and glasses being used in the real world? Here are a few examples ...

**Architects** can manipulate 3-D blueprints to better visualise what they are building and what might need to change.



**Medical students** can practise tricky procedures before meeting the real patient.

**Factory workers** can access checklists and instructions, hands-free and in real time, so they can work more efficiently.



**Shoppers** can see what a new couch might look like in their living room.

The students also reported on **bugs**. Preventing, finding, and eliminating these is an important part of the development process. “It’s very hard to know how software will behave until it’s in the hands of real people,” says Jim. “Every programmer will tell you that lots of their time can be spent troubleshooting.” The Mixipty platform is now in the “beta” phase; it’s usable but still likely to have problems. Feedback from users is still needed.

Because Mixipty was a real-world project, Heena says they all learnt a huge amount. “We got to see a **prototype** turn into the working product and all the stages in between, like responding to feedback.” Some of this feedback came from the students themselves. “It makes sense to involve the target audience in the process,” Heena says. “That way you get to know what they want, not what you *think* they want.”

## READY FOR THE FUTURE

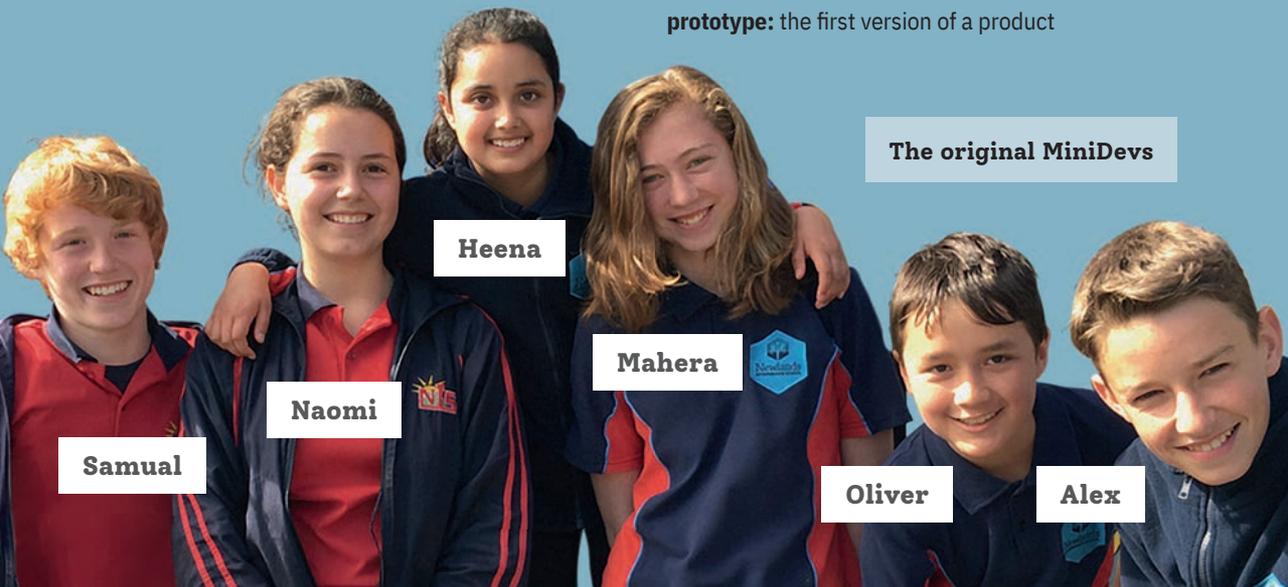
Naomi, now a student at Newlands College, is still involved with the MiniDevs. She says that the best part is having the freedom to experiment. “Often, kids are just told how to do something or what the outcome will be. But it’s much better to work things out on your own, especially if you’re not afraid to make mistakes.” Naomi says they’ve even learnt to celebrate some mistakes.

Augmented and virtual reality have more to offer than just fun and games. AR products are used for education and training, and in the workplace, AR helps people to be faster and safer and to make fewer mistakes. New Zealand has a strong technology sector. It’s predicted to grow fast. With their real-life experience, maybe some of the MiniDevs will work in this exciting industry one day.

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**bug:** a problem in a computer program

**prototype:** the first version of a product



The original MiniDevs

Heena

Naomi

Samual

Mahera

Oliver

Alex

# L E A V E S

After the revolution came to China  
all my mah mah owned was a wide-brimmed sunhat  
that her husband wove from reeds.

Pretend, he said.

You are a grand lady walking in the palace garden.

But the regime was relentless.

One unblinking eye stares from the sky above Canton:  
sweat-slicked hands clasp heavy ploughs,  
dry lips call for skinny cattle.  
Thousands of narrow backs  
twist from the weight  
of carrying a dynasty through famine.  
Under the gaze of that hot sun  
my little mah mah's body became the brown ochre of falling leaves.

Decades later, in Lyall Bay, Mah Mah hands me photos.  
A baby in hung sik, lucky red  
blankets swaddled tighter than they ought to be.

I remember that feeling – a deep pressure in my chest,  
wrinkled brown hands wrap over and over,  
a ballast tied down in a storm.  
While those hands still moved, they whispered to me.  
*You will never go hungry as I did.*  
*Winds may ravage this land, yet you will never be cold.*

On Saturdays we eat cheong fun  
out of takeaway boxes at the market.  
I hang a keipo to dry in icy Wellington wind.





**mah mah:** father's mother

**hung sik:** bright red

**cheong fun:** a delicious snack made from wide rice noodles wrapped around various fillings (vegetables, barbecue pork, shrimp) and served with soy sauce

**keipo:** a short-sleeved, tailored dress with a high neckline that became popular among women in Shanghai during the 1920s and 1930s (also known as a cheongsam or Mandarin dress)

(These words are all Cantonese.)

# Last Match

BY PAUL MASON



## CHARACTERS

WILLIAM SANGUILY (ordinary seaman) | JAMES TEER (passenger)  
JOSEPH JEWELL (able seaman) | BARTHOLOMEW BROWN (first mate)  
MARY ANN JEWELL (Joseph's wife) | OTHER SURVIVORS

**Scene:** *The Auckland Islands, 1866. The survivors of a shipwreck are heaving their boat from the water.*



**WILLIAM SANGUILY** (*speaking to the audience*).

The *General Grant* is lost. Twenty-five fathoms deep. As we escaped from the wreck, I saw Captain Loughlin, clinging to the mizzen-topmast, waving farewell as his ship went down. Standing at his post to the last.

**JAMES TEER** (*speaking to the audience*). We rowed against the waves and the wind and met nothing but sheer cliffs. We stuck to our oars, fighting the cold and our misfortune, until at last, on the afternoon of the third day, we found a safe place to land ...

**WILLIAM SANGUILY** and **JAMES TEER** *rejoin the others.*

**JOSEPH JEWELL.** Heave!

**WILLIAM SANGUILY.** Heave!

**JAMES TEER.** And again!

*With the last of their strength, the castaways pull the boat to shore. They collapse, exhausted, onto the beach.*

**JOSEPH JEWELL.** So cold. Fire. We must have fire. (*He pats his pockets, then calls out to the others.*) Do any of you have a match or flint? Mr Brown, sir?

**BARTHOLOMEW BROWN** *says nothing.*

**JOSEPH JEWELL** *gives his shoulder a shake.*

**JOSEPH JEWELL.** A match, Mr Brown?

**BARTHOLOMEW BROWN** (*staring into space*).

She cried out to me.

**JOSEPH JEWELL.** A match, Mr Brown?

**BARTHOLOMEW BROWN** (*hanging his head*). My wife. Nora.

*The other castaways frantically search their clothes.*

**MARY ANN JEWELL** (*looking around the beach*). Were there really so few of us to survive?

**JOSEPH JEWELL.** And precious little provisions. (*He raises his voice against the wind.*) We must have fire.

**JAMES TEER** (*raising a shaking hand from his pocket, his frozen fingers like a claw*). Matches!

*The others gather around him.*

**WILLIAM SANGUILY.** Many?

**JAMES TEER** (*opening the box, hands trembling*). Six. There are six!

**MARY ANN JEWELL.** Thank heavens. We stand a chance.



**JAMES TEER** collects a few pieces of nearby wood, places them together, and strikes the first match. It sparks and catches alight. The castaways' eyes light up, too. **JAMES TEER** carefully cups the match in his hands. But without any kindling, it quickly goes out.

**JAMES TEER.** I'm a fool. We need dry twigs. Quickly!

*Some of the castaways spread out to look for twigs. Others remain, collapsed and shivering on the beach.*

**WILLIAM SANGUILY** (*speaking to the audience*). The *General Grant* lay berthed eight weeks in Melbourne, loading cargo before we sailed. Mostly wool and hides – and two boxes filled with gold. Many in steerage were goldminers, returning with their finds, but there were families below decks, too. Among them, the Lansons, farmers from France, if I recall, with four children. And Mrs Oat with her four little ones. Eighty-three of us on board all told.

**WILLIAM SANGUILY** joins the other castaways, who begin to add their twigs to the fire.

**JAMES TEER.** Gather round. We need to shield it from the wind.

*With shaking hands, JAMES TEER takes out another match. The castaways watch his every move. He strikes, but the match fails to light. He shakes his head and throws it away. With great care, his movements slow and measured, he strikes another. The castaways hang their heads when it, too, fails.*

**JAMES TEER** strikes a fourth match.

**JAMES TEER.** Light will you!

*There are groans from the castaways as the match goes out.*

**JAMES TEER** (*shaking his head*). The fates are against us. Surely they cannot be so cruel!

**JOSEPH JEWELL** (*speaking to the audience*). We sailed on the fourth day of May, 1866, waving goodbye to Port Phillip, bound for London. All went well until the early hours of the fourteenth. Just past midnight, in darkness, and at the mercy of a heavy swell, we struck rocks ...

**JAMES TEER** (*speaking to the audience*). Those fatal rocks! The jib boom struck and sheared off. The vessel shot astern into another rocky point. Then we lost our rudder, throwing the man at the wheel and breaking his ribs. The seas forced our head into a cavern. Further and further into that cave we went.

**JOSEPH JEWELL.** Walls towered over us. It was so dark you could not see your fingers before your eyes. The ship crashed and shuddered against the unforgiving rock.

**JAMES TEER.** The foremast struck the roof, taking the main topmast with it. Spars crashed to the deck. Large stones fell, shattering timber. We fled below.

**JOSEPH JEWELL.** What followed was such a night of horror as I think never experienced by human beings. We bumped and juddered again and again. More stones crashed onto the deck. We were afraid the vessel would sink before morning, and if she had, there would not be anyone left to tell our sorry tale.

**JOSEPH JEWELL** and **JAMES TEER** rejoin the others. **JAMES TEER** strikes another match. It goes out. The castaways watch as the useless match drops to the ground.

**WILLIAM SANGUILY** (sobbing). That's five. Five matches gone!  
What will we do?

**BARTHOLOMEW BROWN.** We are doomed!

**MARY ANN JEWELL.** We need to calm ourselves.

**JAMES TEER.** I need to think.

*The castaways freeze.*



**BARTHOLOMEW BROWN** (*speaking to the audience*). With daylight, the captain gave the order for the boats to be readied. The first boat set off to find a safe landing – it was all the men on the oars could do to keep it off the rocks. Another was lowered to carry the women and children. Captain ordered me on board to take charge.

**MARY ANN JEWELL** (*speaking to the audience*). I slid down the rope and dropped into the icy water. I reached for the side of the boat. Mr Teer tried to help. Then I felt arms around me. It was Joseph. He pushed me on board. By then, the sea poured over the *General Grant*. The cave filled with the shrieks of those on deck. But we could not rescue them, our boat was half-full of water and in danger of sinking herself.

**BARTHOLOMEW BROWN** (*sobbing*). Nora.

**BARTHOLOMEW BROWN** and **MARY ANN JEWELL** *rejoin the others. The castaways stare at JAMES TEER in a hush. Some hold their heads in their hands.*

**JAMES TEER**. The last match.

**MARY ANN JEWELL**. Our last chance.

**WILLIAM SANGUILY**. If it fails?

**JOSEPH JEWELL**. It won't fail.

**WILLIAM SANGUILY** (*hysterical*). But if it does, we're done for.  
The cold! We'll perish.

**BARTHOLOMEW BROWN** (*suddenly becoming alert and grabbing for the box*). Let me.

**JAMES TEER** (*shoving him off*). Away with you.

**MARY ANN JEWELL**. Gentlemen, please! This gets us nowhere!

**BARTHOLOMEW BROWN** and **JAMES TEER** *stop tussling but still glare at each other.*

**JAMES TEER**. One last match.

**JOSEPH JEWELL**. Make sure it is well and dry.

**JAMES TEER**. Aye.

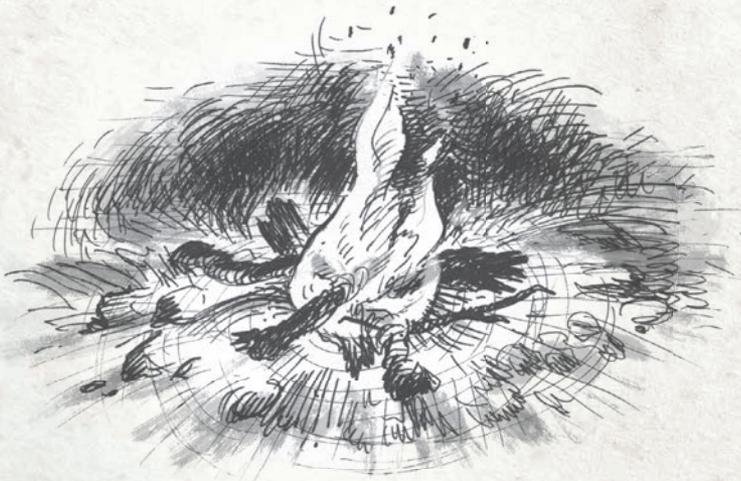
**JAMES TEER** finds a dry place on his clothes and slowly, carefully rubs the match. He closes his eyes for a moment and steadies himself. **WILLIAM SANGUILY** gets up and leaves the others. He holds his head in his hands, unable to watch. **JAMES TEER** strikes the match. His eyes widen as it catches. Then, gently, he puts it on the kindling. The others watch, holding their breath. Slowly, their faces brighten. As the flames begin to grow, they reach out with grateful hands. **WILLIAM SANGUILY** turns around and sees the smoke. He stumbles over.

**JOSEPH JEWELL.** And from that one match ...

**WILLIAM SANGUILY.** Nursed with the most desperate care ...

**JAMES TEER.** We obtained a fire, which we kept alive every day of the long months we were on those isles.

**MARY ANN JEWELL.** So few of us made these shores. The others, sixty-eight persons, lost their lives, fourteenth of May, 1866, by wreck of the ship *General Grant* on Auckland Isles.



THE WOOD ENGRAVING ON PAGE 18 IS FROM  
THE ALEXANDER TURNBULL LIBRARY.  
IT WAS FIRST PUBLISHED IN 1868.

ALL OTHER ILLUSTRATIONS ARE BY ALEX CARA.



## AUTHOR'S NOTE

The *General Grant* was sailing from Melbourne to London when it struck trouble in the subantarctic Auckland Islands. Eighty-three people were on board, but only fifteen made it ashore. To survive, they grew potatoes and caught wild pigs. After nine months, four men set out in a boat, bound for Bluff, almost 500 kilometres away. They were never seen again.

Rescue finally came for the remaining castaways in the shape of the *Amherst*. They had survived eighteen long months in the harshest conditions imaginable. At their suggestion, the *Amherst*'s captain left behind a tin trunk filled with the tools needed for survival in case other poor souls found themselves marooned. Included was a box of matches. The castaways also left behind memorials carved on slate for the passengers lost.

This play is based on the actual accounts of the survivors. The names are real, and some of the lines are their own. The castaways really did believe that their lives hung in the balance the moment they struck the last remaining match.

It didn't take long for treasure hunters to begin searching for the *General Grant*'s gold, but it was never found. Legends of the lost treasure persist to this day.

# THE WINNING SIDE

by Sarah Johnson

“What you need to win an election,” thought Nia, “is charisma.”

She wasn't exactly sure what charisma was. She'd heard it on TV once, used to describe a famous actor. By the look of him, it meant having a smile so bright it made people blink.

Mrs Lamb, their principal, did *not* have charisma. She'd spent the whole assembly going on about the election. She hadn't smiled once. Mrs Lamb had been inspired by the general election; she wanted their school to have one, too. Students would stand as candidates, and the candidates with the most votes would go on the new student council, which would help make decisions about running the school. All the students had to vote. It was their democratic responsibility.

“I might enter,” Nia told Sefina at break.

“Enter what?”

“The election. Mum says I have a great smile.” Nia flashed her best Hollywood, then explained her theory about charisma.

“It's much better to have an agenda,” said Sefina.



“An agenda,” said Nia. “Why?”

“Because it's what you stand for. You need to focus on some kind of issue. And have a plan.”

“Oh,” said Nia. She didn't have either of those. “What about the paint job in the girls' bathroom? Why do girls always get pink?”

Sefina rolled her eyes. “That's not a real issue. It needs to be something important.” She gave Nia a meaningful look. “You need to be representative too.”

“What do you mean?”

“You know ... diverse. The things you campaign about should matter to all kinds of people. Honestly, Nia. If you paid more



attention in social studies, you'd know all about this."

Nia shrugged. Mr Hunt, their social studies teacher, had the charisma of a carrot.

"Amy Armstrong has some really good ideas," Sefina said.

"Amy Armstrong? How do you know?"

"I'm her campaign manager. We're having our first meeting at lunchtime." Amy was captain of the netball A team. She was also captain of the debating team and sang in the school band. Nia doubted she needed a manager. "You know how the school needs more sports facilities?" Sefina continued.

"Well, Amy came up with the idea of using

the area behind the library. It could fit four new netball courts."

"But that's where the bush block is," Nia protested.

"So? No one cares about the bush block. The only problem is that all the other sports teams heard Amy's idea, and now they want the space, too. We have a fight on our hands," Sefina said, looking pleased.

"A fight?" said Nia. "Couldn't you just talk about it?"

Sefina smiled. "Oh, Nia. You have a lot to learn about politics."

. . . . .



On Wednesday, the election candidates gave speeches in the hall. Nia sat in her favourite spot at the back. Now that she knew about agendas, she could see that all of the candidates had one – a big idea they were pushing. A couple of students spoke about the unhealthy food at the tuck shop, one wanted to change lesson times, but most of them wanted more space for sports. James Apanui thought rugby should have top priority. Oscar said football. Jane made a convincing case for softball. The only thing the speakers had in common was where they thought the new facilities should be: behind the library, where the bush block was.



Amy Armstrong was the last to speak. She argued that netball was the game of the future. She even quoted statistics, then sang a waiata. There was loud applause.

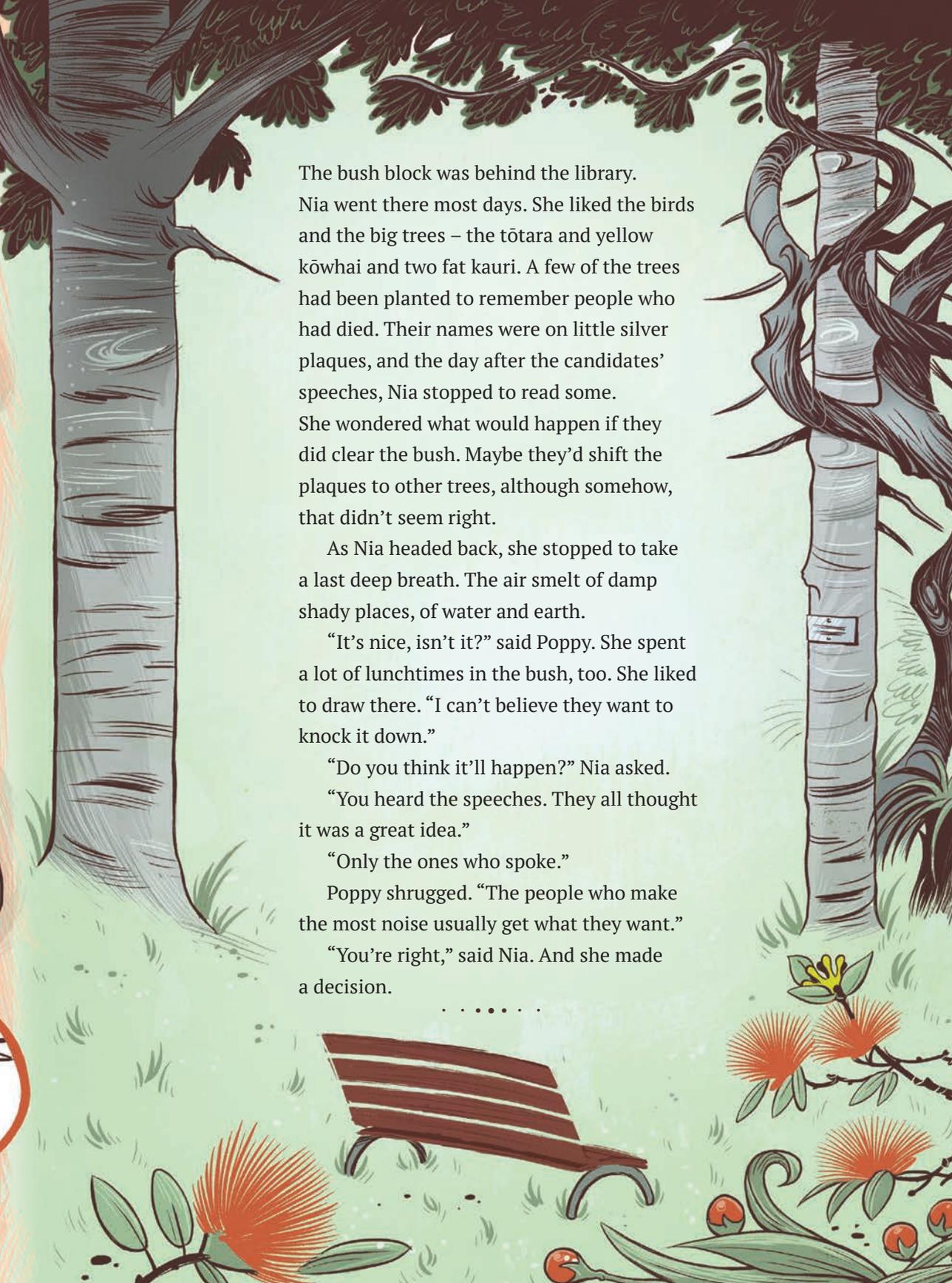
“What did you think?” Sefina asked Nia on the way out.

“You don’t even like netball,” said Nia.

Sefina grinned. “Got to back the winning side,” she said.

.....



The illustration depicts a lush forest setting. On the left, a large tree trunk with textured bark rises vertically. On the right, another tree trunk is shown with thick, dark, gnarled vines or roots spiraling around it. The ground is covered in green grass and several vibrant orange-red flowers with yellow centers. In the lower center, a simple wooden bench with dark legs sits on the grass. The background is a soft, light green, suggesting a misty or shaded forest atmosphere.

The bush block was behind the library. Nia went there most days. She liked the birds and the big trees – the tōtara and yellow kōwhai and two fat kauri. A few of the trees had been planted to remember people who had died. Their names were on little silver plaques, and the day after the candidates’ speeches, Nia stopped to read some. She wondered what would happen if they did clear the bush. Maybe they’d shift the plaques to other trees, although somehow, that didn’t seem right.

As Nia headed back, she stopped to take a last deep breath. The air smelt of damp shady places, of water and earth.

“It’s nice, isn’t it?” said Poppy. She spent a lot of lunchtimes in the bush, too. She liked to draw there. “I can’t believe they want to knock it down.”

“Do you think it’ll happen?” Nia asked.

“You heard the speeches. They all thought it was a great idea.”

“Only the ones who spoke.”

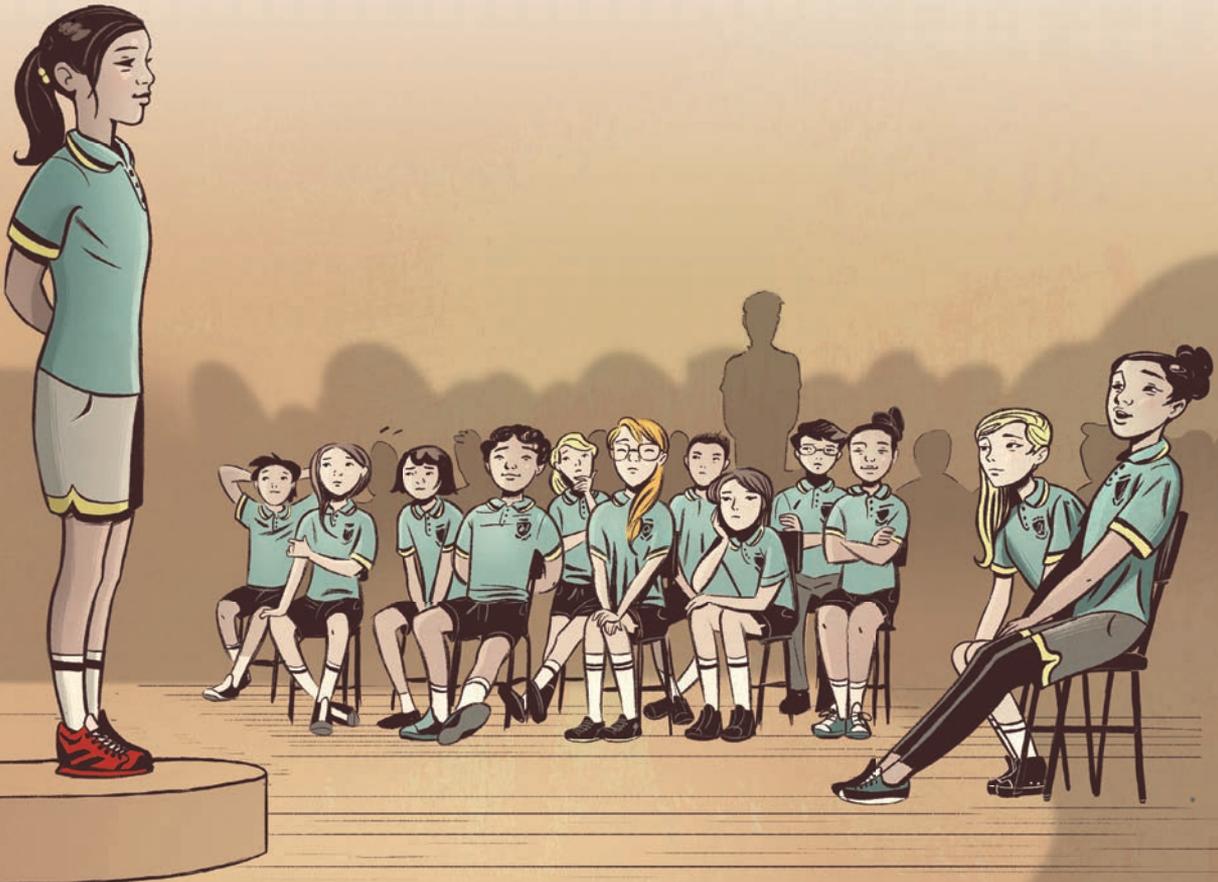
Poppy shrugged. “The people who make the most noise usually get what they want.”

“You’re right,” said Nia. And she made a decision.

.....

On Friday, there were speeches from more candidates. Nia found her seat. Her hands were sweaty, but she was sticking with her plan. Most of these students said the same thing. There was a lot of talk about the bush and using the space for sports. The audience booed and cheered, depending on which sport they played. Then it was Nia's turn. She kept her eyes on her feet as she went up to the stage, forcing herself to breathe slowly. Then she looked up. Sefina's mouth was hanging open like she was watching Mrs Lamb do a tap dance.

Nia began with the bush block and how beautiful it was. She talked about the names on the trees and the kids who used the space and why: to draw or chat or just hang out. Then she talked about the benefits of sport, the way it was good for a person's body and mind. "But being peaceful is also healthy," she added. "And we should recognise that this is a big school and not everyone likes sport. We need to look after the quiet people too, the ones who don't have the most to say. They need somewhere to go to feel comfortable. And that's why we need the bush. That's why we can't get rid of it."



There was silence. Then Mr Kite, the new art teacher, began to clap. Other people clapped as Nia returned to her seat. For the first time, she was sorry she sat at the back. It took a long time to get there.

. . . . .

After assembly, Poppy came over. “What you said was really good. I hope it works.”

On the way back to class, lots of kids stopped Nia. Some said they would vote for her. Others just wanted to talk about the bush. A few even mentioned the plaques.

Sefina was waiting outside their class. “Great speech,” she said, “but you’ll need a campaign manager.”

Nia grinned. “I thought you were Amy’s manager?”

“I’m changing sides.”

“Can you do that?”

“Course I can. It’s politics. I’ll come over after school. We’ll write your policies.”

Nia frowned. “My what?”

Sefina rolled her eyes. “Policies, Nia! What you intend to do once you’re elected – your *plan*. You really do need to pay attention in social studies!”

Nia sighed. “I suppose you’re right.” Then she remembered she was an electoral candidate and flashed Sefina a charismatic smile. “Welcome to the winning side!”



illustrations by Craig Phillips



# FEED

BY MATT BOUCHER

**There is no doubt. Our planet is warming, and our climate has begun to change. Since the 1800s, when people first burnt fossil fuels for power, Earth has become hotter by around one degree Celsius. Scientists warn if our planet's temperature rises by just another half a degree, the impact of climate change will become more extreme and harder to control. At the current rate of warming, 1.5 degrees could be reached by 2034.**

## **The Unknown Future**

Scientists agree that 1.5 degrees of warming is only the start. An increase of two degrees – even three or four – isn't out of the question. It's why people now talk of a climate crisis. Predicting exactly how much Earth's average temperature will rise, and by when, is a tricky business – and not because we don't understand the causes of climate change. We do. What we don't know is how people and their governments will respond to the huge challenges that lie ahead. If we want to keep the rate of warming as low as possible, we need to radically alter the way we live – now. But are enough of us prepared to make the necessary changes? And make them quickly?

There's another unknown factor when it comes to how intensely we'll experience climate change: feedback loops.



# B A C K

## WHAT IS CLIMATE CHANGE?

Climate change describes a long-term shift in temperature and weather patterns. While the phrase can refer to change in one particular area, most people talk about climate change as something that affects the entire planet. Earth's climate has always varied, but we now know that the increases in temperature in recent decades have been caused by human activity, especially the burning of fossil fuels.

Fossil fuels provide energy. They allow us to make electricity, heat our homes, power factories, and drive cars. But burning fossil fuels also releases greenhouse gases into the atmosphere, the layer of air around Earth that prevents heat from escaping too quickly and keeps Earth's surface warm. Without the atmosphere, our planet would be too cold to support life. However, the atmosphere needs to be just the right temperature so we don't have the opposite problem: too much heat. More greenhouse gases help to trap more heat, making Earth warmer. This trend is called global warming.

## Climate Feedback

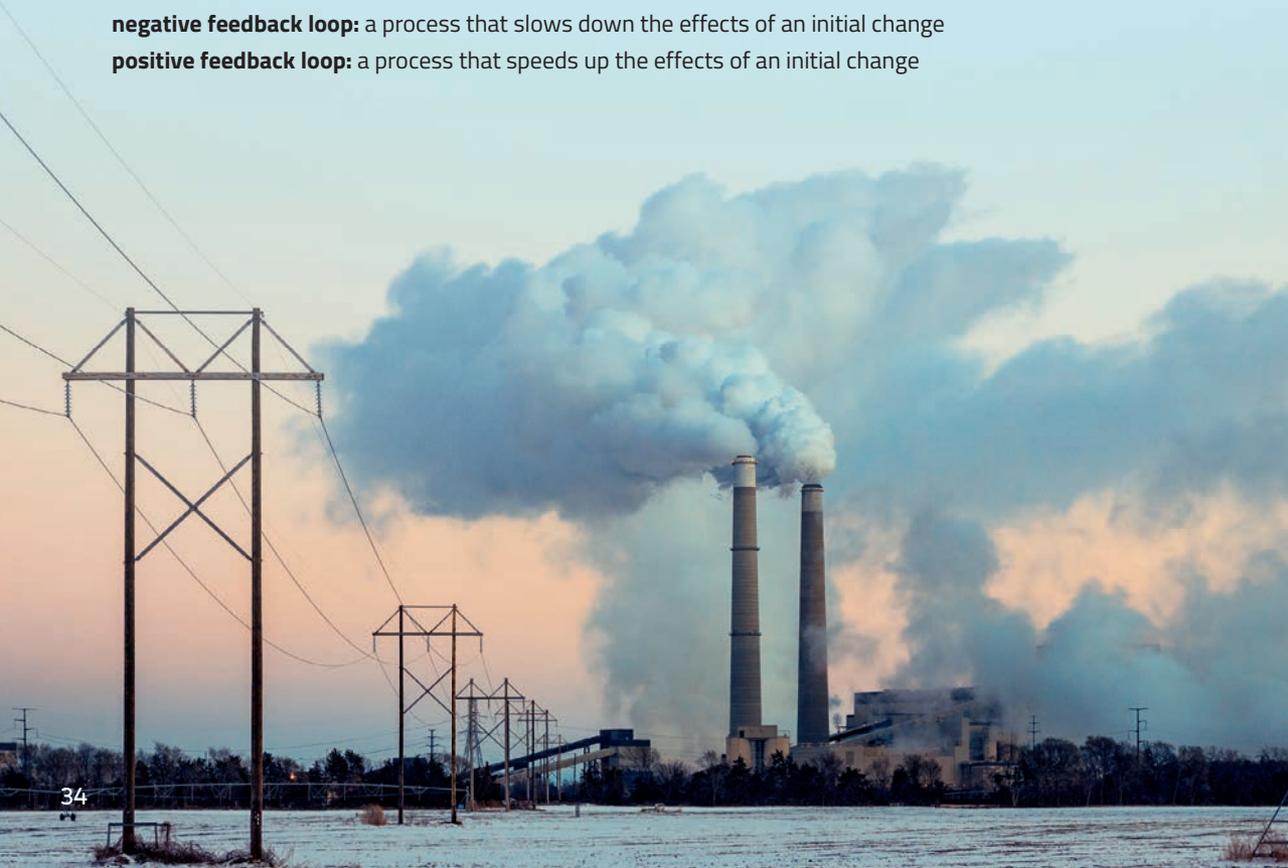
Earth has supported at least some form of life for nearly 4 billion years. This has been possible because natural processes helped to keep the climate relatively stable. After long periods of volcanic eruptions, for example, when large amounts of carbon dioxide were released into the atmosphere, plants and the ocean absorbed some of that carbon dioxide. Without processes like these, known as **negative feedback loops**, Earth's climate would have been more erratic.

In recent decades, however, human activity has had a major impact on the planet. In less than a century, people have dug up and burnt huge amounts of fossil fuels, which took millions of years to form. Burning these fuels released a massive amount of carbon dioxide and other greenhouse gases into the atmosphere, raising their concentration to levels not seen for over 3 million years. Negative feedback loops are continuing to work, but not quickly enough. In the meantime, Earth's temperature is on the rise.

The news gets worse. Feedback loops come in two kinds. While negative feedback loops slow down the effects of climate change, **positive feedback loops** speed them up. Scientists fear this second kind will have a big role in the future, leading to an even worse outcome. So what are they?

**negative feedback loop:** a process that slows down the effects of an initial change

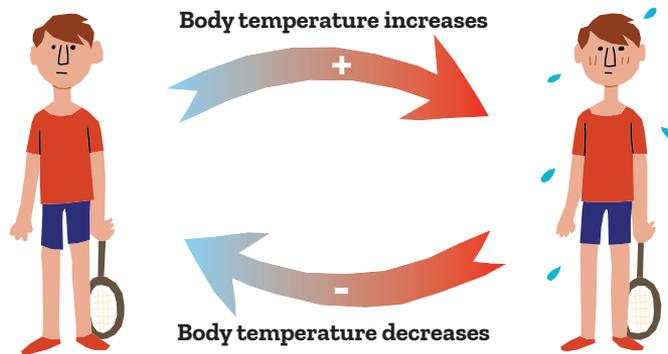
**positive feedback loop:** a process that speeds up the effects of an initial change



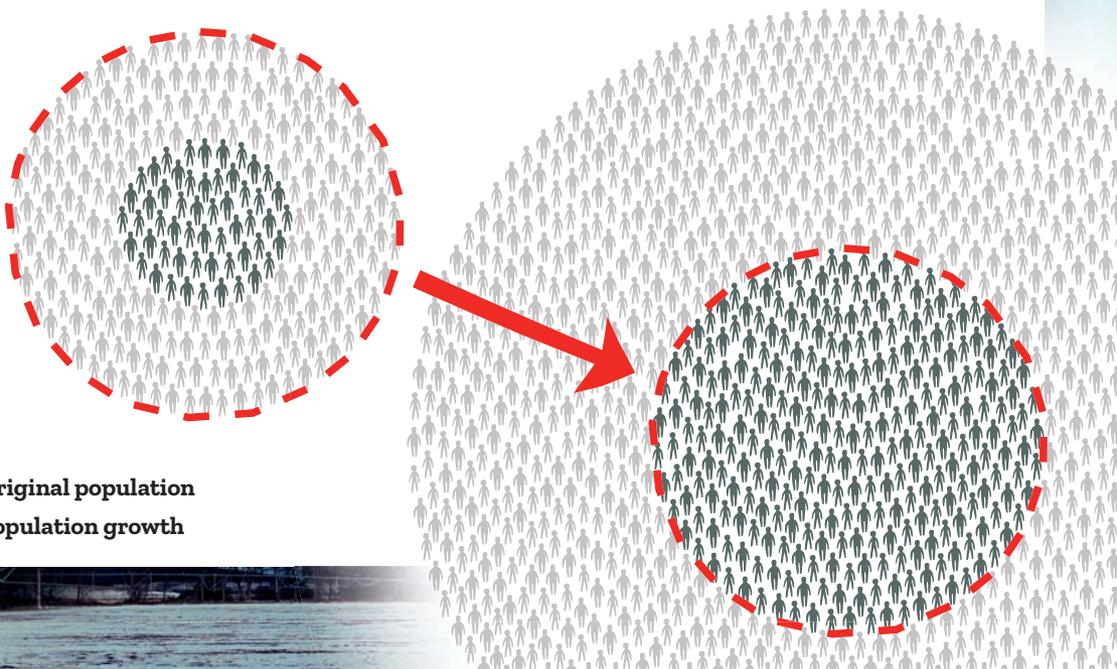
## FEEDBACK LOOPS

A feedback loop is a circuit-like system in which one thing (an input) changes another thing (an output). These loops are found everywhere: in nature, computer software, heating systems, the economy, even the human body.

As we know, feedback loops come in two kinds: negative and positive. A negative feedback loop helps to keep things in balance because it reduces the effects of change. When you get hot, for example, you start to sweat (an input). The evaporating sweat cools you down, helping your temperature return to normal (an output).



A positive feedback loop increases the effects of change. This can be seen in the way population growth works. When a population gets bigger, there are more people to have babies (an input). These babies grow up and go on to have their own babies, and the population gets even bigger (an output). The bigger a population, the quicker it grows.



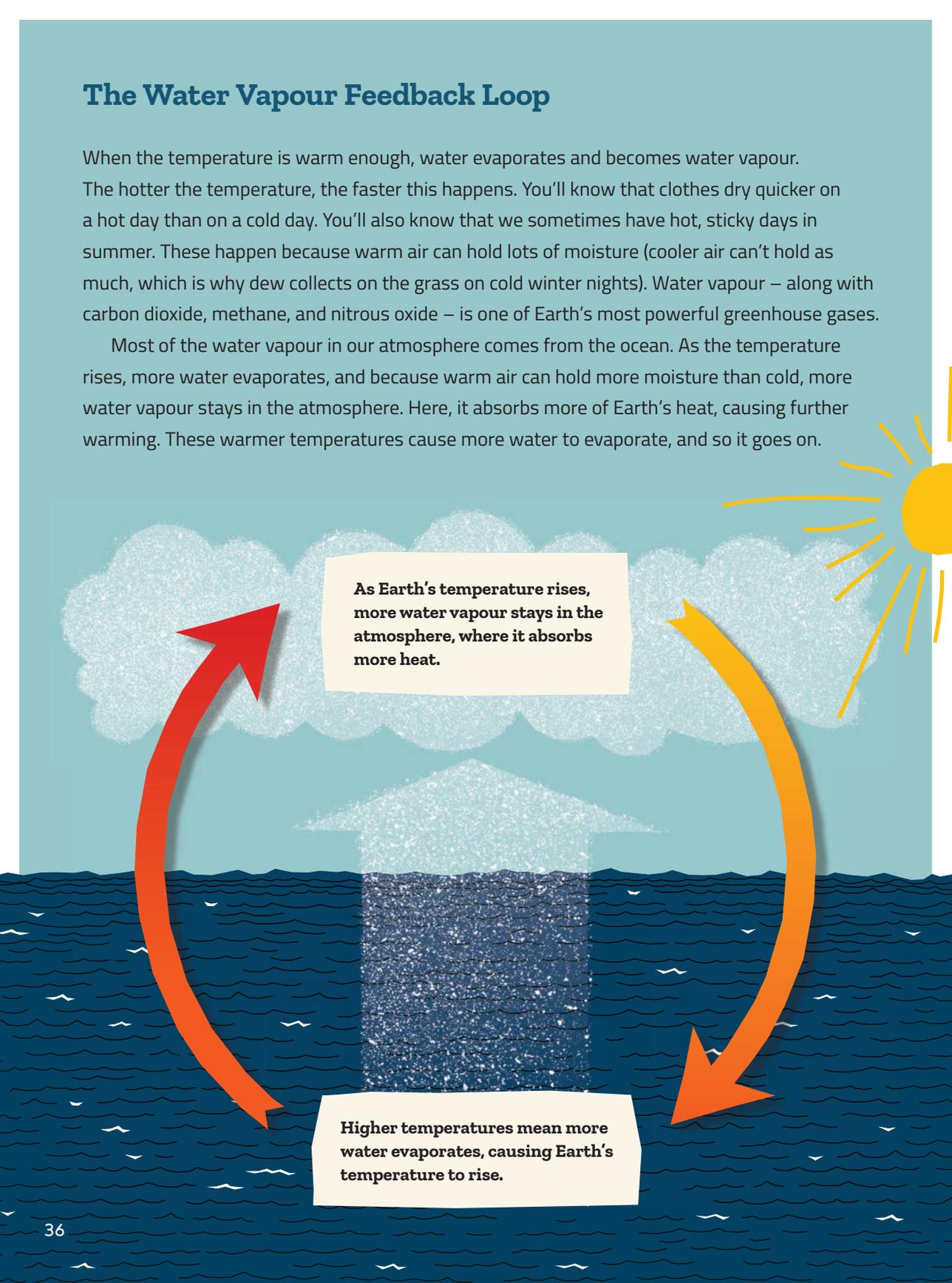
### KEY

-  Original population
-  Population growth

## The Water Vapour Feedback Loop

When the temperature is warm enough, water evaporates and becomes water vapour. The hotter the temperature, the faster this happens. You'll know that clothes dry quicker on a hot day than on a cold day. You'll also know that we sometimes have hot, sticky days in summer. These happen because warm air can hold lots of moisture (cooler air can't hold as much, which is why dew collects on the grass on cold winter nights). Water vapour – along with carbon dioxide, methane, and nitrous oxide – is one of Earth's most powerful greenhouse gases.

Most of the water vapour in our atmosphere comes from the ocean. As the temperature rises, more water evaporates, and because warm air can hold more moisture than cold, more water vapour stays in the atmosphere. Here, it absorbs more of Earth's heat, causing further warming. These warmer temperatures cause more water to evaporate, and so it goes on.



The diagram illustrates the water vapour feedback loop. It features a central vertical column of water rising from the ocean surface into the atmosphere. A red arrow on the left points upwards from the ocean to the atmosphere, while an orange arrow on the right points downwards from the atmosphere back to the ocean. A yellow sun is visible in the top right corner, and white clouds are scattered in the sky. Two text boxes provide key information: one in the atmosphere and one in the ocean.

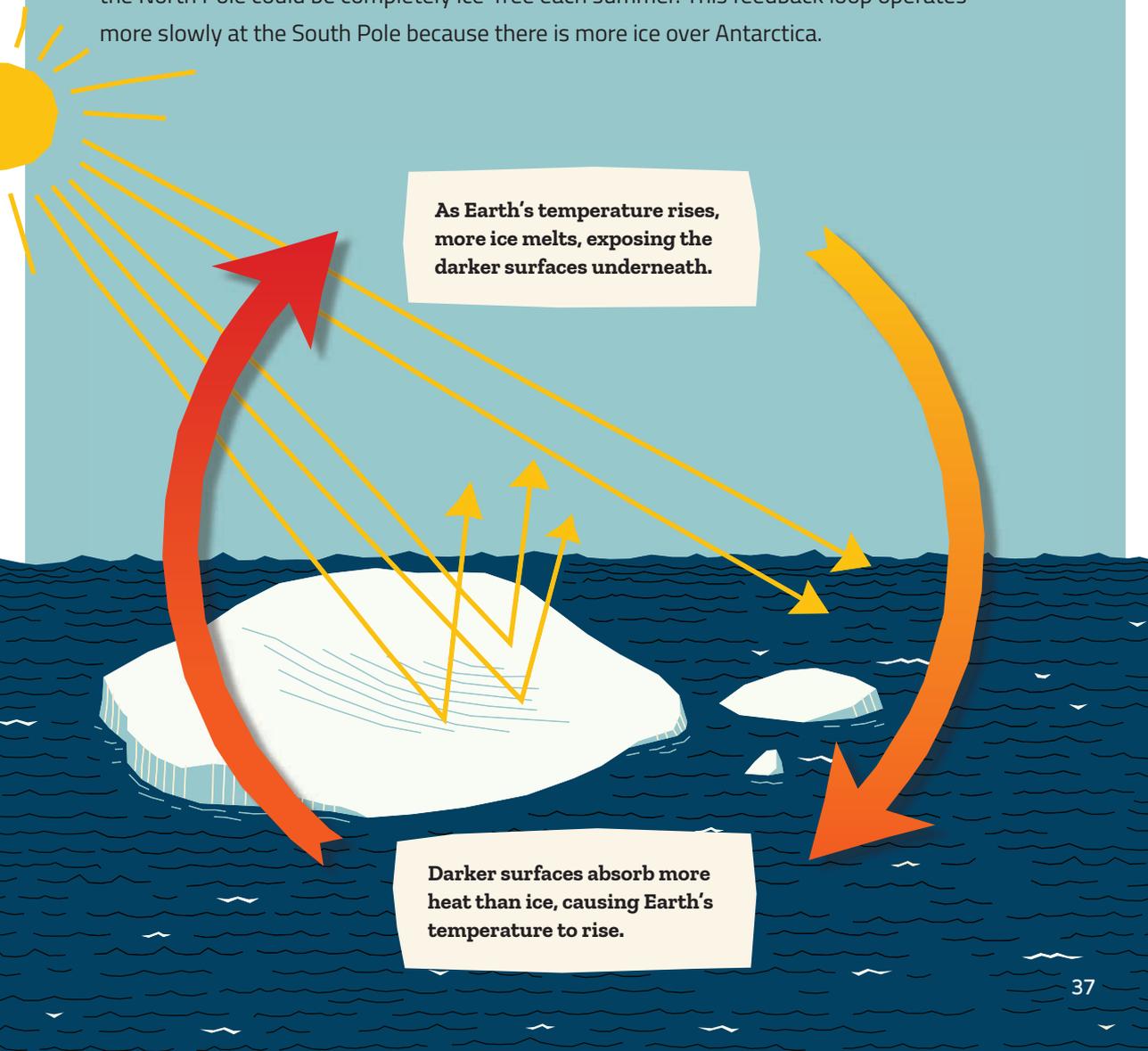
**As Earth's temperature rises, more water vapour stays in the atmosphere, where it absorbs more heat.**

**Higher temperatures mean more water evaporates, causing Earth's temperature to rise.**

## The Ice Albedo Feedback Loop

The coldest parts of our planet are covered in ice all year. Because ice is a light colour, it reflects the sun's heat back into space, which helps keep Earth cooler. But as the temperature rises, the ice in these places is melting, exposing water or land underneath. These surfaces are darker than ice, so they absorb heat, making Earth hotter instead of cooler. The amount of light a surface reflects is called its albedo.

As Earth continues to warm, more ice melts. With less ice to reflect the sun's heat and more exposed water and land to absorb it, Earth's temperature climbs further. In other words, heating = melting = more heating = more melting. Scientists say that by 2040, the North Pole could be completely ice-free each summer. This feedback loop operates more slowly at the South Pole because there is more ice over Antarctica.



**As Earth's temperature rises, more ice melts, exposing the darker surfaces underneath.**

**Darker surfaces absorb more heat than ice, causing Earth's temperature to rise.**

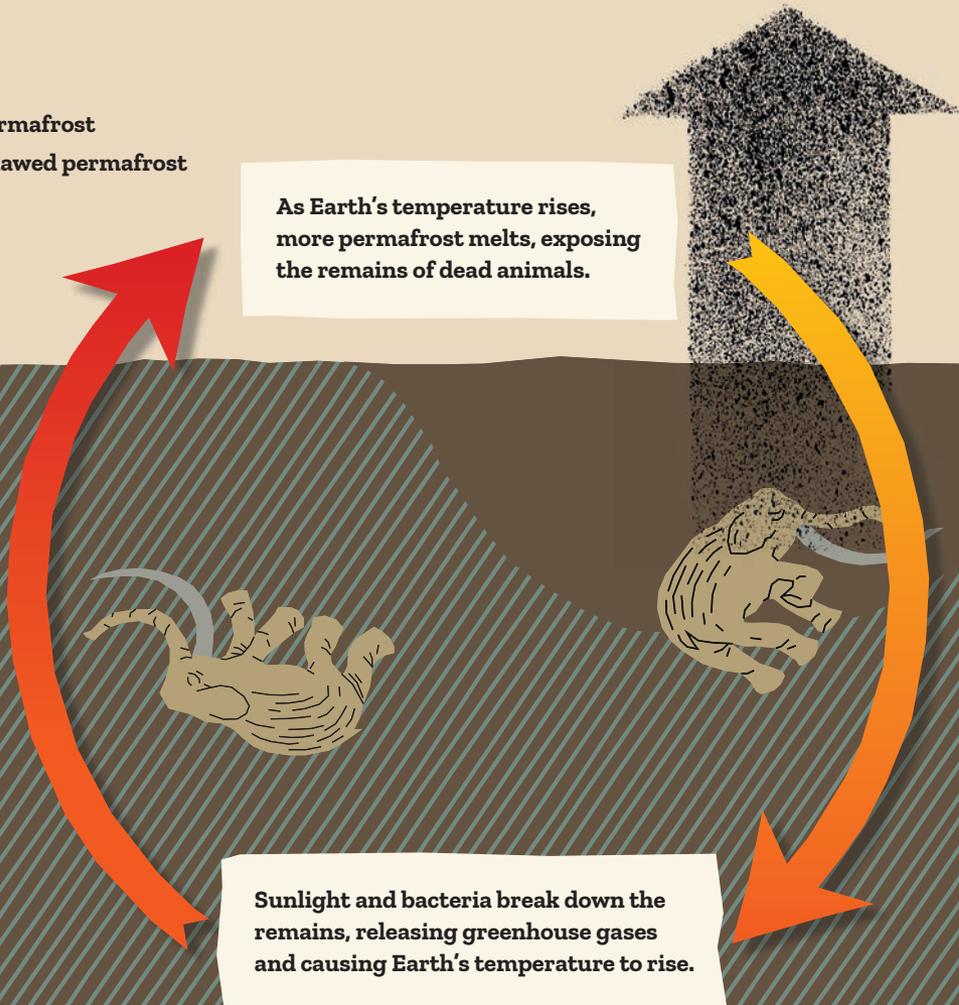
# The Permafrost Feedback Loop

Very cold parts of Earth, such as the Arctic, aren't always covered in snow and ice, but they are cold enough to have frozen ground all year. This is called permafrost (permanent frost). Permafrost contains all of the usual things that soil contains, including the remains of dead animals. Some of these animals are very large, including frozen mammoths found in Russia. These ancient creatures have been preserved in permafrost for over four thousand years.

Because Earth is warming, its permafrost is starting to thaw. As this happens, the frozen animals thaw, too. Their remains are broken down by sunlight and bacteria, a process that produces carbon dioxide and methane. This increase in greenhouse gases warms Earth further, causing more permafrost to thaw. More thawing permafrost leads to more thawing remains and more carbon dioxide and methane being released.

## KEY

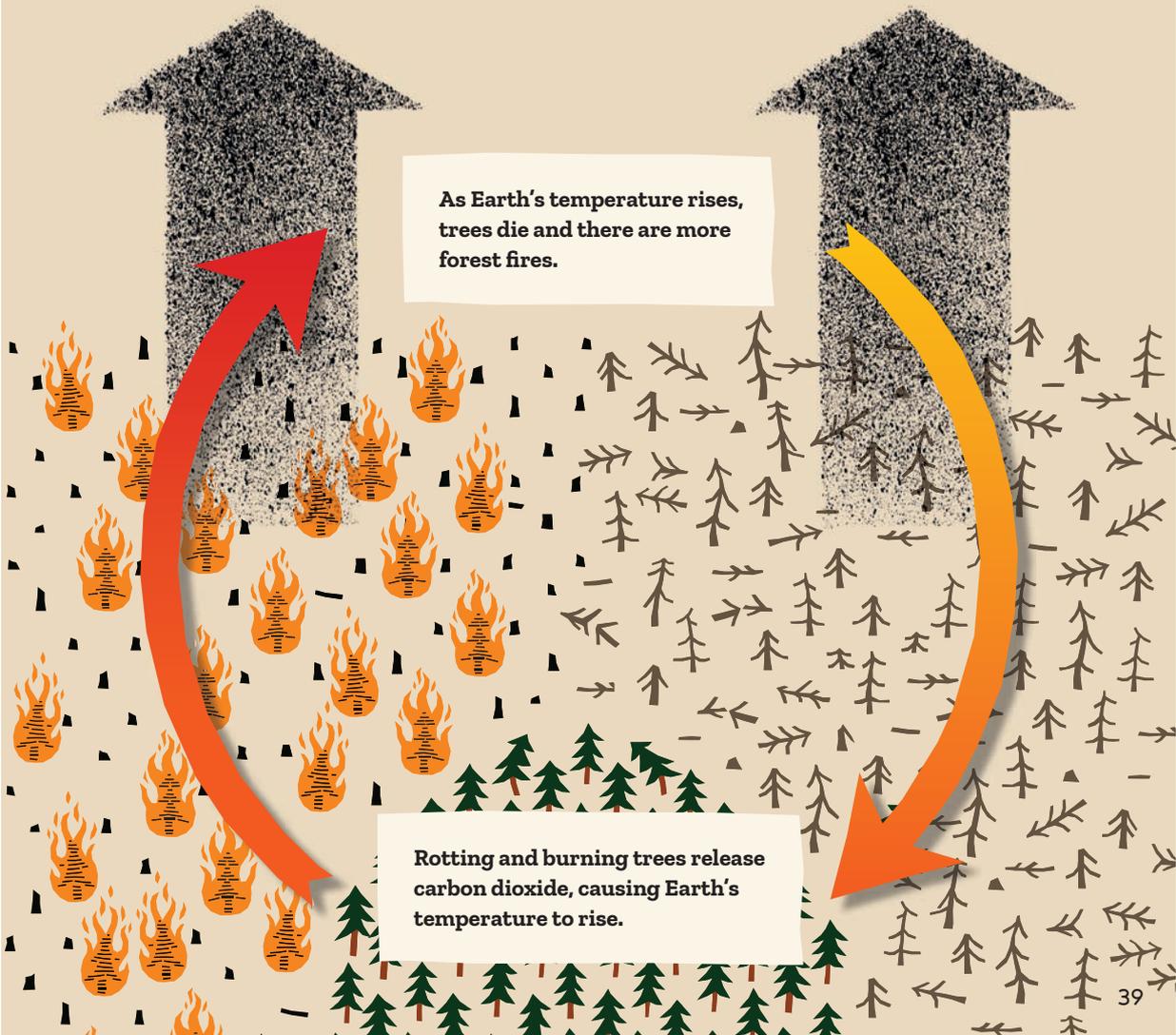
-  Permafrost
-  Thawed permafrost



## The Deforestation Feedback Loop

Trees and other plants help clean Earth's atmosphere. They "breathe" in carbon dioxide and "breathe out" oxygen. As parts of the world become hotter and drier, trees and plants get less of the water they need to survive. Our forests, especially our tropical rainforests, are shrinking and even dying. A hotter planet also means more trees are burning in forest fires. The loss of forests on a large scale is called deforestation.

Fewer trees on the planet means less carbon dioxide is absorbed from the atmosphere, and rotting and burning trees also release carbon dioxide. This results in a lot more carbon dioxide in the atmosphere, which means more warming. More warming leads to more deforestation.





## Time to Act

Many more positive feedback loops are already at work; others haven't kicked in. And new feedback loops – both positive and negative – will be discovered, but the ones we do know about make climate change hard to predict. Positive feedback loops also make Earth's temperature rise even faster. The sooner we cut greenhouse gas emissions, the sooner the effects of positive feedback loops will reduce.

Earth has warmed quickly in the last few centuries, and now that change is speeding up. The rate at which we are emitting greenhouse gases into the atmosphere has exploded in the past few decades. Half of all emissions from the last 250 years have occurred in the previous thirty years. While people are the problem, we can also be the solution. If we act quickly and make significant changes, starting today, we can slow global warming and save our planet.



## SOPHIE HANDFORD: FEEDBACK FOR CHANGE

Sophie Handford wants to make the world a better place. For her, this means fighting climate change – something she’s been committed to since the age of twelve. So how does Sophie fight? “By helping people understand we’re facing a crisis and encouraging them to take action.” Sophie says that getting results is partly about the numbers. “When people learn about climate change, they talk. They influence others, and then those people talk. As the word spreads, we can make positive change on a large scale – exactly what the planet needs.” You could call it a positive feedback loop.

Sophie had always followed the work of climate activists overseas. She was deeply affected by the student strikes in other countries. Could the same thing happen here, she wondered? She began to make contacts and co-ordinate people. The first strike she helped organise, in March 2019, drew 20,000 people. A second strike came six months later, when over 170,000 people took part. New Zealand had more protesters per capita than any other country in the world (3.5 percent of the population).

It was a busy year. Sophie also ran for council in the local body elections and won a seat on the Kāpiti Coast District Council. She’s now – at eighteen – New Zealand’s youngest councillor. She wants to ensure young people have a voice. She also speaks for the environment because that, she says, isn’t often represented, either.

Sophie has a message for students. “Climate change is the biggest challenge we’ve ever faced, and it can feel like the news is all bad. But there’s still time, if we act now. Find your tribe and feel empowered. Trust your voice, then use it for change.”



# MUSE

by Paul Mason



**T**hey left the wind chimes softly chinking at the river's edge and found a narrow track, hidden by low ferns. Tre climbed the slope into the bush, Muse close behind. After all that had happened, were they finally close? Tre had to find his parents. He *had* to.

"You sure this is right?" whispered Muse.

"Mum's wind chimes are a sign. This is it."

"Maybe we should carry on upriver? Stay on our own?" Muse said. There was hesitation in her voice.

Tre jerked an arm in warning. Up ahead, a silhouette peered from behind a ponga. He froze, letting out a long breath a few seconds later. It was a carved post, with a wooden head and shoulders – a sentry with a camera. He recognised the shape of the pouwhenua and the hand that had carved it and allowed himself a careful smile. "Come on. This way."





**A**fter a short walk, the bush gave way to a camp. Bivouacs and low canvas tents huddled beneath a veil of green netting. Faces young and old emerged from the shadows to study Tre and Muse. One boy, brawny in his T-shirt, scowled and turned his back.

"It's OK, everyone. False alarm," Dad announced to the camp with a wide grin. "This is my son, Tre, and his friend Muse. They escaped!" He turned to them. "Welcome to Camp Radical."

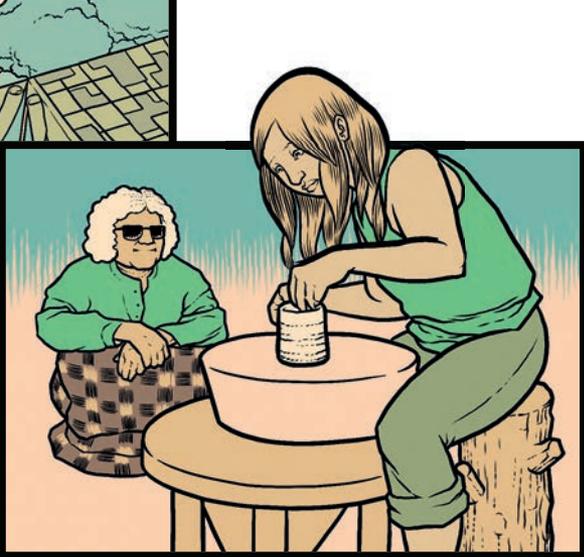
"The Radicals!" said Tre. "I didn't believe you existed." He'd heard the rumours in the city, back in the pen. A few kids in the dorm had liked to talk, but Tre never believed the things they said. He'd needed hard proof that never came.

"We're real all right – no thanks to the Voids. But we're well-hidden from their spies," Mum said. She gestured at the green fabric above their heads.

"Let me show you where to dump your things," said Dad. "Then a tour."

He took them to a long tent, the floor covered in flax mats and rows of bedrolls and sleeping bags. "Women on one side, men on the other. You'll have to squeeze in."

First Dad showed them the pottery tent. A girl was at the wheel, a wet cup rising from beneath her fingers as an elder watched on. Nearby, kids had settled on logs to read. Tre thought all the books had been destroyed. Others were writing, and more children worked in the kitchen tent, chopping vegetables, stirring, tasting.



“Remember what all this looks like?” Mum asked. She ran a hand over his cheek.

“Mum’s a teacher,” Tre explained to Muse.

“As long as we’re free to create, our voices won’t be hushed,” his mother said.

“Then we have a chance,” said Dad.

“Come and see where we carve.” He took them to a lean-to on the edge of the camp. Inside, Tre recognised the surly boy from before. He was bent over a tree trunk, a mallet and chisel in his hands.

“I knew that was your pou out in the bush, Dad,” said Tre.

Dad nodded towards the boy. “That was one of Phyn’s.”

The boy looked up from his tapping and gave a slow nod, misgiving still in his eyes. Tre noticed the tools in his hands – they were Dad’s. With a pang, he realised he’d not yet earned the right to use them. “Nice one,” he murmured as Phyn went back to work.



**T**hat evening, they shared dinner around the fire, steaming plates on laps, happy chatter mingling with the smoke. One of the adults had a ukulele and sang about dreams and tricky roads ahead and better days. Beside Tre, Mum joined in. It was good to hear her voice again. Tre leant closer to feel her warmth. He'd missed it so much.

"It's like we're in a cave," Muse said at last. She nodded at the dim solar lights around them like so many glow-worms. "A magical cave."

"You happy?" asked Tre.

Muse looked conflicted for a moment, then nodded. "It's just that when we were trapped in the city, I never thought we'd actually get here. For it to be like this."

"But that's a good thing, right?" said Tre.

Muse stood. "I'm wiped," she said, leaving his question unanswered.

Tre realised he was exhausted, too. He wasn't long to bed after Muse, and at first, he was glad to be wedged in, sleeping with the others. But someone nearby snored like a hog. Then he had to pee. He got up and found his boots.

As he staggered through the camp, something moved in the dark. Moonlight caught a face, a backpack on shoulders. "Muse?"

She started and spun around, but after a brief pause hurried on. She was heading towards the track, back to the river.



Tre stumbled after her, wishing he had a torch. "Muse!" he hissed, finally catching up. He grabbed at her backpack and held on. "What are you doing?" He felt her shoulders slump, then she turned to face him. Tears spread down her face.

"Let me go. You're in danger."

"Who?"

"All of you. Your mum and dad. This place."

"What? What are you talking about?"

Tre searched the darkness, suddenly afraid.

Muse wiped her eyes on the sleeve of her jacket. "Let me get away before the Voids come. You'll have a better chance."

"You're not making sense. How are they going to find us?"

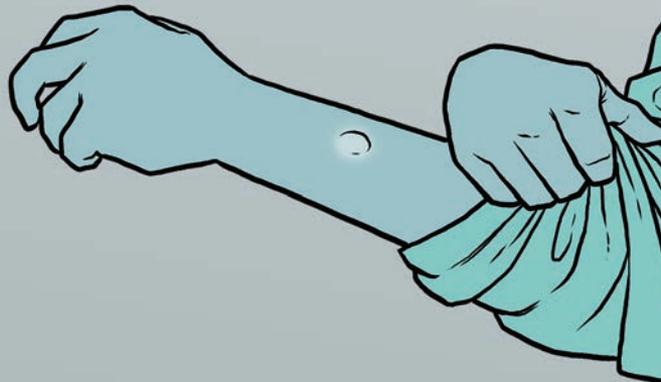
Muse lifted her gaze and held his. Tre felt himself go cold. "I don't believe it," he whispered.

Muse shoved up her sleeve and thrust a bare forearm in his face. Tre saw the faintest of glows, just beneath her skin, and ran a gentle finger over the raised bump of the tracker.

"I had no choice. They have my family." She began to cry harder, but Tre pushed her arm away.

"So, tell me – are the squads on their way?"

"Not if I keep moving. They'll think I'm still searching."



Tre snorted. "So our whole escape was a set-up?"

Muse gave a slow nod. "I was to help you get away from the city. They knew you'd eventually find your parents and the Radicals."

"You used me."

“But then we became friends. And I saw this place. Your parents, the children. How much this means. I need to leave you all behind.”

A voice burst out of the dark. “Enough!”



Tre spun around and felt a sudden, searing blow to his ribs. He dropped to the ground, clutching his side. Another thud, and Muse fell, too. “Traitors,” growled Phyn, twirling his staff and standing over them.

Tre held up a hand, gasping for breath. “Listen –”

“I heard it all,” Phyn snapped. “I followed you the moment I saw you leave the tent.”

“Then you’ll know what Muse has in her arm. We have to get away from here. Now.”

“How about we cut it out?” said Phyn.

Muse shook her head. “It’ll set off an alarm. They’ll home in on us straight away.”

Tre nodded. “We need to get out of here.”

“We?” said Muse.

“We’re in this together.”

“No way. You can explain yourself to the others, to your parents,” said Phyn.

“Just let us go,” Tre pleaded. “We’ll be gone before anyone knows.”

Phyn shook his head, and Tre got to his feet. “Look. If Mum and Dad find out about this, they’ll want to help Muse and me. But their work is here, keeping this place alive. Dad needs someone to follow in his steps.” He let out a long breath. “Turns out it was you instead of me.”

Phyn was silent.

**A**nd then it was the two of them once more, racing for the boat in the darkness. Leaving behind a letter of farewell, clutching at the remains of hope. As long as people thought for themselves, breathed fresh ideas, there was always hope.

Tre remembered a remote track that crossed the ranges at the far end of the lake. There were huts dotted along the way. They would go there and keep moving until they figured out what to do with the tracker in Muse’s arm. The signal had to die out sometime. Nothing lasted forever.

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