

The Great Company Adventures · Book 3 of 50

SIEMENS THE TRAIN THAT RUNS ON LIGHTNING



A curious girl, three wise mentors, and the silent train that turns invisible lightning into motion.

"Discovering the businesses that built the modern world"

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THE GREAT COMPANY ADVENTURES

Discovering the businesses that built the modern world.

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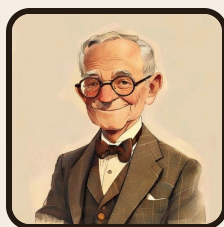
Illustrations were created with AI image tools; the text was written with AI assistance. All content is reviewed and edited by our editorial team.

For readers aged 7 and up. First Kindle edition, 2026.
Published by Omaha Investments.

MEET THE CHARACTERS



SIRI



BEN



WARREN



CHARLIE



PETRA

A curious girl named Siri, a wise old teacher named Ben, and his student Warren with Warren's partner Charlie — together discovering the businesses that built the modern world, one adventure at a time.

THE GLOBAL 50

One great company per volume · Fifty adventures, one modern world

SPACE & EXPLORATION

1. SpaceX — *"The Fire That Comes Back"*

MANUFACTURING & ENGINEERING

2. Toyota — *"The River That Builds Cars"*
3. Siemens — *"The Factory That Builds Factories"*
4. Caterpillar — *"The Machines That Move Mountains"*
5. Boeing — *"The Bird With Six Million Pieces"*
6. Airbus — *"The Plane Four Countries Built"*

ENERGY & INDUSTRY

7. Shell — *"The Sunlight Buried at Sea"*
8. ExxonMobil — *"The Ancient Sunlight Machine"*
9. GE Vernova — *"The Wheel That Makes Lightning"*

COMMUNICATION

10. AT&T — *"The Voice Inside the Wire"*
11. Qualcomm — *"The Whisper in the Air"*
12. Ericsson — *"The Towers That Talk"*

TRANSPORTATION

13. Tesla — *"The Car With No Engine"*
14. John Deere — *"The Machine That Feeds the World"*
15. UPS — *"The Promise in a Brown Truck"*

INFRASTRUCTURE

16. ABB — *"The Arms That Never Tire"*
17. Schneider Electric — *"The Guardian of the Grid"*

MATERIALS

18. Corning — *"The Thread of Light"*
19. DuPont — *"The Inventors of Almost Everything"*

SCIENCE & TOOLS

20. 3M — *"The Factory of Ten Thousand Ideas"*
21. Bosch — *"The Spark in Every Machine"*
22. Honeywell — *"The Dial That Tames the Weather"*

MEDICINE & BIOTECHNOLOGY

23. Pfizer — *"The Shield in a Tiny Vial"*
24. Roche — *"The Detectives of the Blood"*

25. Novo Nordisk — *"The Key to a Billion Locks"*

26. Johnson & Johnson — *"The Little Bandage That Grew"*

FOOD & AGRICULTURE

27. Nestlé — *"The Cup That Wakes the World"*
28. Cargill — *"The Invisible Harvest"*

FINANCE & COMMERCE

29. Visa — *"The Handshake Inside the Card"*
30. Mastercard — *"The Two-Second Trust Machine"*
31. Walmart — *"The Store That Never Runs Out"*
32. Costco — *"The Treasure Warehouse"*
33. FedEx — *"The Race Against the Sun"*

CONSUMER INNOVATION

34. Disney — *"The Factory of Dreams"*
35. LEGO — *"The Brick That Builds Anything"*
36. Sony — *"The Pocket Full of Music"*
37. Coca-Cola — *"The Secret in the Red Can"*
38. Nike — *"The Shoe That Learned to Fly"*

LUXURY & CRAFTSMANSHIP

39. Rolex — *"The Heartbeat on Your Wrist"*
40. LVMH — *"The Suitcase That Conquered the World"*

COMPUTING & DIGITAL CIVILIZATION

41. Apple — *"The Glass That Thinks"*
42. Microsoft — *"The Invisible Machine"*
43. Google — *"The Library With No Walls"*
44. Amazon — *"The Box That Crossed the World"*
45. NVIDIA — *"The Brain Made of Sand"*
46. Intel — *"The First Thinking Chip"*
47. TSMC — *"The Invisible City"*
48. ASML — *"The Machine That Prints With Light"*
49. OpenAI — *"The Machine That Learned to Talk"*

THE FINAL DISCOVERY

50. The Company Yet to Be Built — *"The Adventure You Will Build"*

THE TRAIN THAT GLIDED AT MIDNIGHT

Midnight. Homework: unfinished. And Grandpa Ben's old brass compass? Spinning like crazy.

SPIN

The needle stopped — pointing at her little silver model train. Which was gliding. All by itself. Silently.

Toy trains don't **DRIVE** themselves!

The magic diary flipped open by itself. Fresh ink. Grandpa's handwriting.

It's never done **THIS** before...

"Time to meet the businesses that built the modern world. Start with the train that runs on lightning."

★ WORTH REMEMBERING

A real high-speed train weighs more than 400 elephants, yet glides faster than a race car — with no engine, no fuel, no smoke. Just a thin wire overhead. So... **who taught metal to run on lightning?**

The model train's headlight flared. A whirlpool of blue light grabbed her.

WHOOSH



Here we GOOO!



SIRI'S SECRET NOTEBOOK

New mystery! 📖

- ① How does a train move with NO engine and NO fuel?
- ② Grandpa says one quiet train built a 175-year giant. A train?! Prove it.

A GIANT WITH NO ENGINE



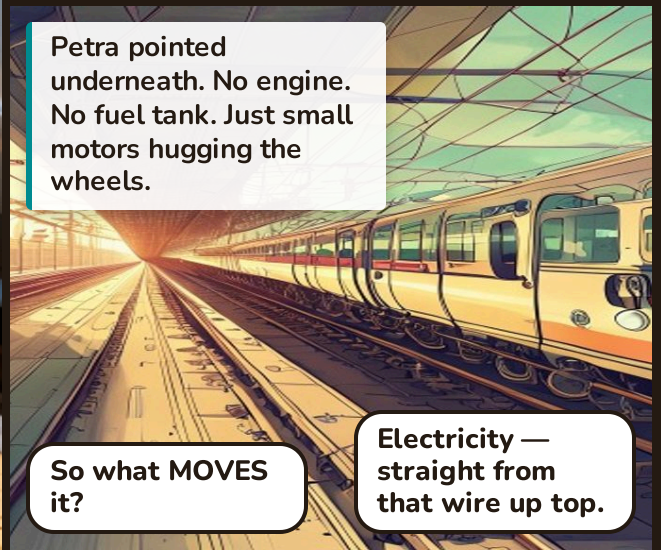
She landed beside a silver train longer than a street, humming softly, ready to fly.

It's so QUIET. Where's the roar?



A young engineer waved her over. "I'm Petra. I help trains run on lightning."

Best. Job. EVER.



Petra pointed underneath. No engine. No fuel tank. Just small motors hugging the wheels.

So what MOVES it?

Electricity — straight from that wire up top.

★ WORTH REMEMBERING

A car burns fuel in an engine. This train has neither. It sips electricity from a wire and turns it straight into motion. First question: how can invisible electricity **push** a 400-elephant train? ⚡

📖 SIRI'S SECRET NOTEBOOK

No engine! No fuel! ⚡ Just motors on the wheels + a wire overhead. Petra says every part hides a secret. First up: how does electricity **PUSH**?

LIGHTNING IN A COIL

3a The push: electricity that becomes a magnet

On the roof, a springy arm reached up and kissed the wire. A blue spark ran down into the train.

ZZZZ

Petra ran electricity through a coil of wire. Suddenly it grabbed a pile of paperclips.

The wire turned into a **MAGNET**?!

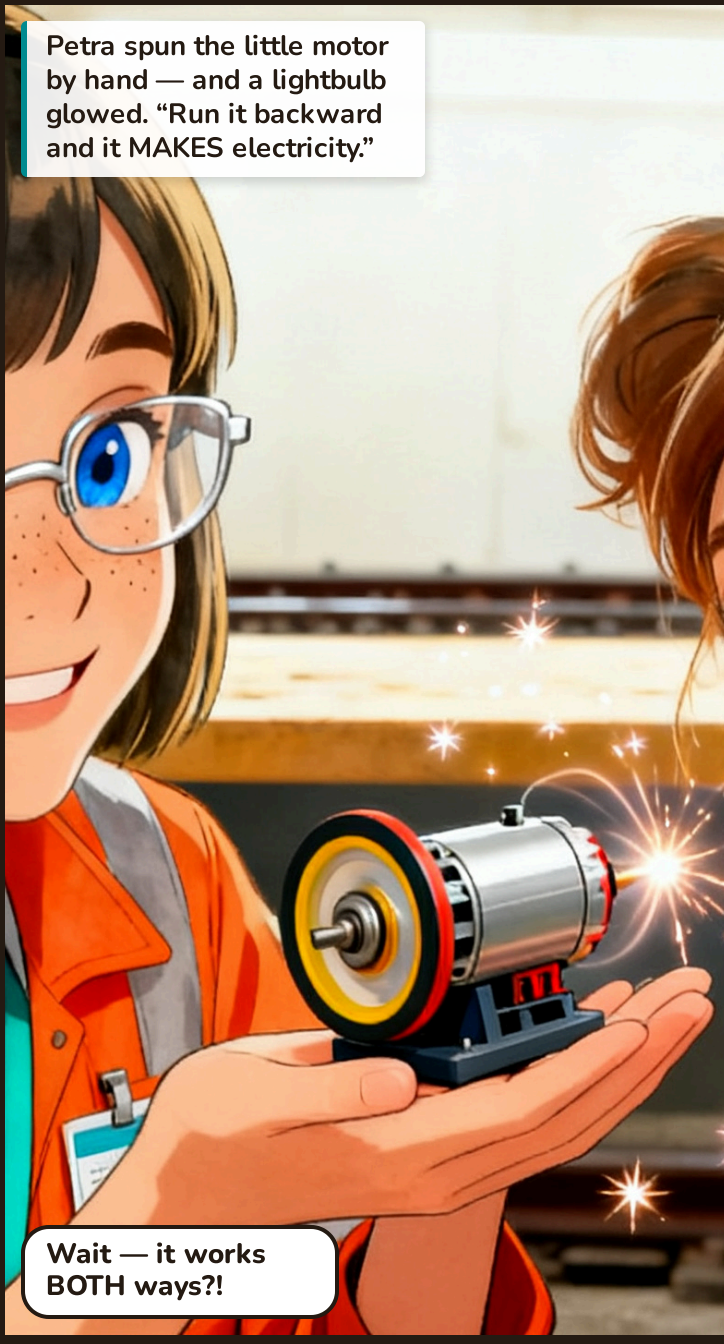
“That’s a motor’s whole trick. Magnets chase magnets in a circle — and spin the wheel.”

Electricity becomes a magnet becomes **SPIN**!

It’s **DRINKING** the lightning!

★ WORTH REMEMBERING

A motor is just electricity **pretending to be a magnet**. Magnets push and pull; arrange them in a ring and keep flipping the push, and they chase their own tails — forever. No fire, no pistons. Just invisible magnetism turning wheels. 



Petra spun the little motor by hand — and a lightbulb glowed. “Run it backward and it **MAKES** electricity.”

Wait — it works **BOTH** ways?!



“So when the train brakes, its motors become generators. The train's speed turns back into electricity — for the **NEXT** train.”

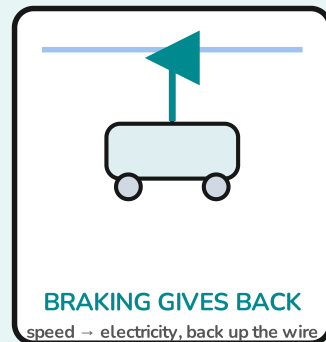
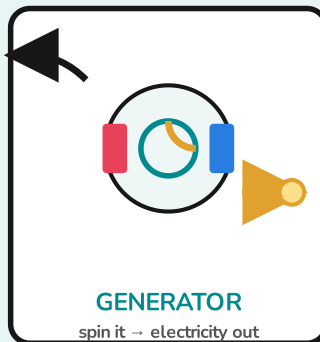
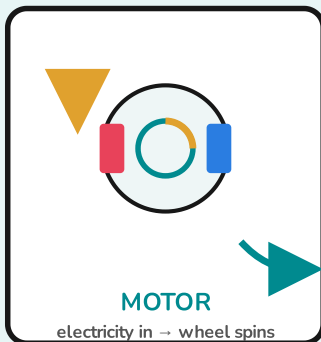
It gives its power **AWAY!**

★ WORTH REMEMBERING

Here's the beautiful secret: a motor and a generator are the **same machine**. Electricity in → motion out. Motion in → electricity out. When this train slows down, it doesn't waste its speed — it remembers it as lightning and hands it to another train. 



THE SAME MACHINE, BOTH WAYS



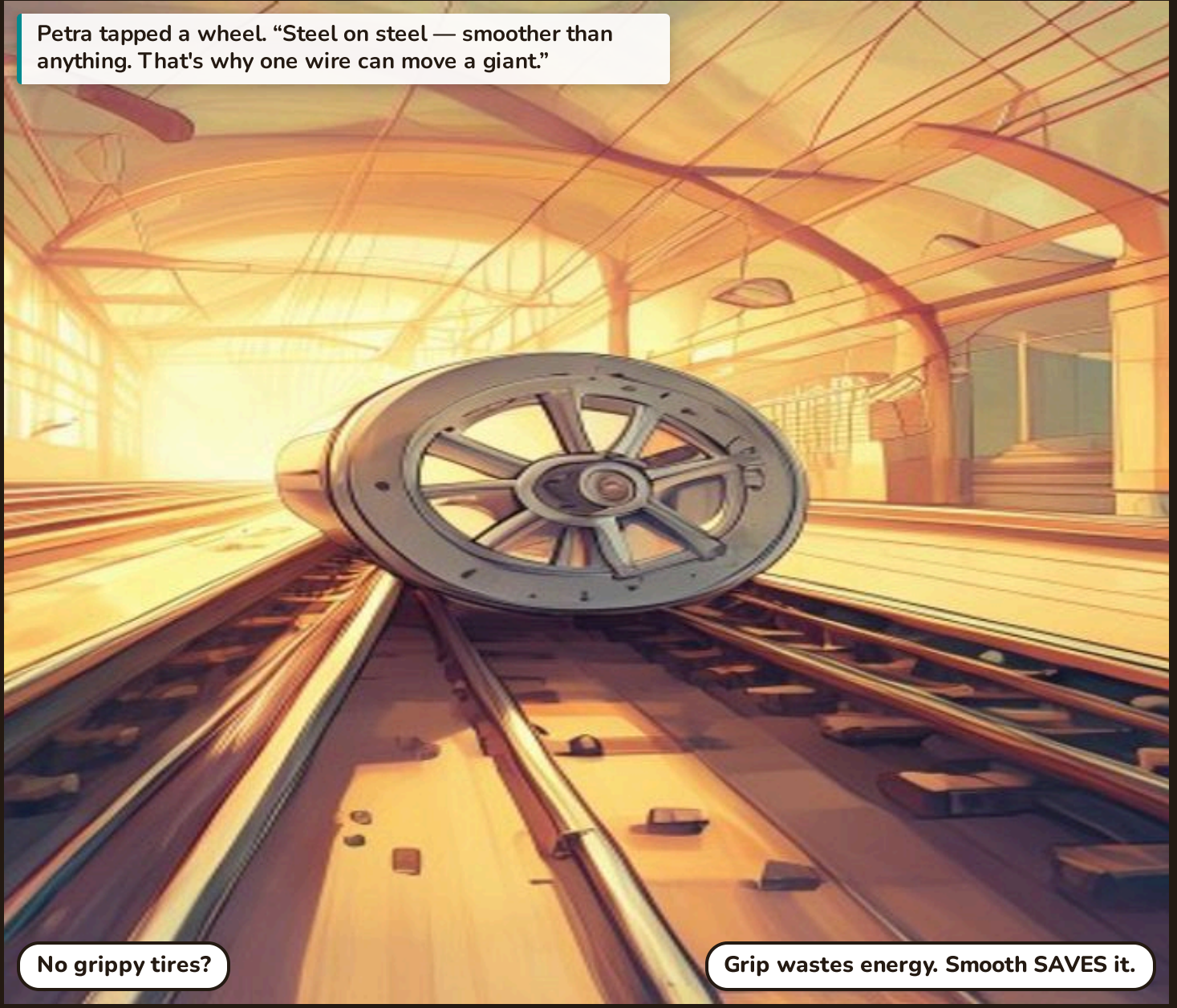


SIRI'S SECRET NOTEBOOK

- ① Motor = electricity pretending to be a magnet
→ spins the wheel. 
- ② Same machine backwards = a GENERATOR.
Braking turns speed back into electricity for
other trains. Nothing wasted! 

STEEL, AND THE RIVER OF POWER

Petra tapped a wheel. “Steel on steel — smoother than anything. That's why one wire can move a giant.”



No grippy tires?

Grip wastes energy. Smooth SAVES it.

★ WORTH REMEMBERING

Steel wheel on steel rail slips along with almost **no friction** — that's why a thin wire can pull 400 elephants. And each wheel is slightly cone-shaped, so it quietly **steers itself** back to the centre of the track. Physics as a groove.



“But where's the wire's power from?” Petra traced it back — to power stations, pylons, and a trackside substation.



The wire is fed by a whole COUNTRY!

“And two trains never crash, because the track is sliced into invisible blocks. One train per block.”



A brain in a box guards each piece!

★ WORTH REMEMBERING

The rails have **nerves**. A controller — a brain in a box — makes sure only one train sits in each block of track. That same 'brain in a box' idea, we'll see soon, also runs entire factories. Remember it. 🧠

📖 SIRI'S SECRET NOTEBOOK

- ① Steel on steel = almost no friction; cone wheels self-steer. 🚆
- ② Power comes from the whole grid.
- ③ Signals slice track into blocks — a brain-in-a-box per block. (Where else does that brain live? 🤔)

THE LONGEST MACHINE IN THE WORLD

Petra led her into a factory where whole train cars grew on stands, big as houses.

They BUILD them here?

Almost every part. Under one roof.

She unrolled a map. Golden threads from many countries, all meeting at one silver train.

The whole world helps build ONE train!

Welders. Coders. Motor-winders. Signal engineers. Test drivers. Each guarding one small thing.

How many people build ONE train?

Thousands. Each an expert in a sliver.

At night, on a long test track, a finished train screamed past at full speed. Silent, then gone.

Faster than my homework crosses the room!

WHOOSH

★ WORTH REMEMBERING

Here's the mind-bender: **nobody on Earth knows how to build a whole train.** The welder can't write the code; the coder can't wind a motor. Everyone masters one sliver — and a great company turns thousands of slivers into one silent arrow. 🙌

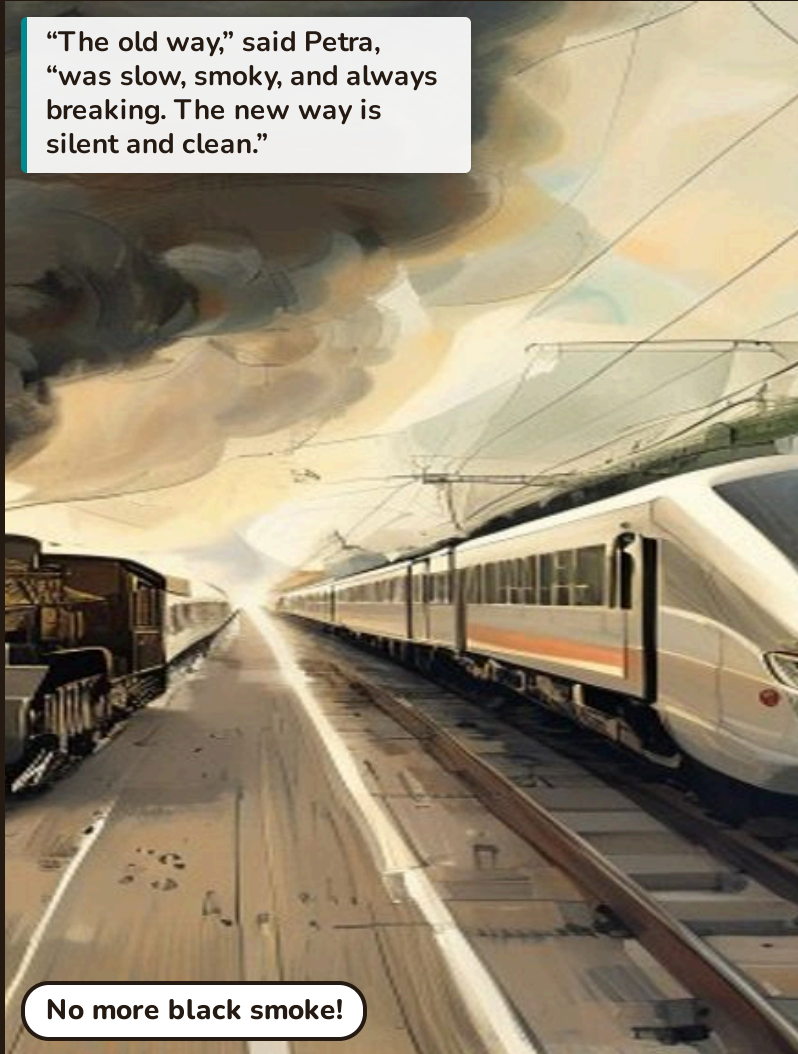
📖 SIRI'S SECRET NOTEBOOK

Welders + coders + motor-winders + signal engineers = thousands of hands, one train.

🔧 Nobody knows the whole recipe. So who's the CONDUCTOR of this orchestra? 🎵

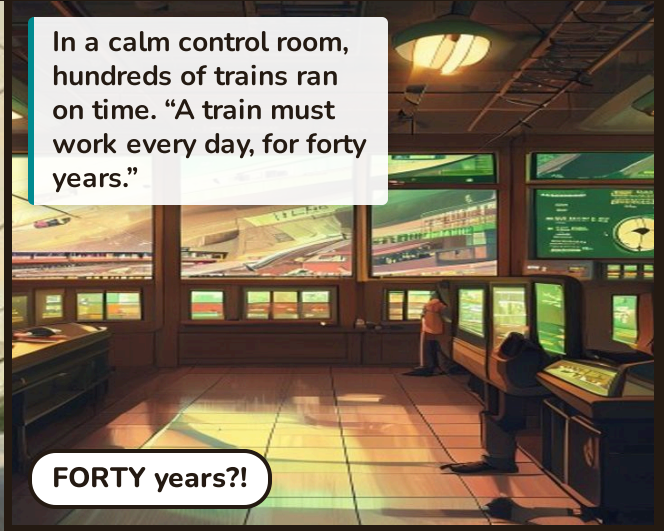
WHY THE WORLD BUYS THE SAME MACHINE

"The old way," said Petra, "was slow, smoky, and always breaking. The new way is silent and clean."



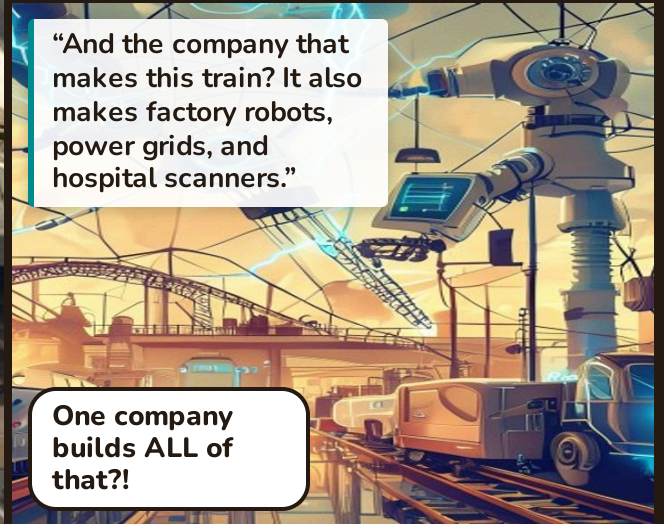
No more black smoke!

In a calm control room, hundreds of trains ran on time. "A train must work every day, for forty years."



FORTY years?!

"And the company that makes this train? It also makes factory robots, power grids, and hospital scanners."



One company builds ALL of that?!

★ WORTH REMEMBERING

Buyers don't pay for metal — they pay for a **promise**: it will still run in forty years. Reliability is the treasure. And the same wizard who makes the train makes the machines behind the whole modern world. 🧙‍♂️

📖 SIRI'S SECRET NOTEBOOK

People buy RELIABILITY, not metal — a train must run 40 years. 🧙‍♂️ And one company makes the train, the factory robots, the grid, AND the scanners? Compass is spinning again... 🧭

THE BACKYARD THAT WIRED THE WORLD

Petra opened a great door — a hall of trains, robots, grids and scanners. Siri read the name and gasped.

“It began in 1847. A Berlin backyard. Two men — an inventor, Werner, and a craftsman, Halske — building a telegraph.”

A GIANT started in a BACKYARD?

“In 1866, Werner found how to make electricity in huge amounts — the dynamo. The whole electric age begins here.”

SIEMENS! The lightning train is theirs!

He unlocked the LIGHTNING!

"Then, 1879: the world's FIRST electric train, at a Berlin fair, pulling delighted passengers in circles."



The very first one!
In a top hat!

"And today? They build the factories that build everything — even testing them first as glowing ghost-copies."



A factory built in a
computer FIRST?!

★ WORTH REMEMBERING

Their boldest idea was to keep reinventing what they built: telegraph → electric power → electric trains → factory automation → medical scanners. One thread runs through all of it — **master electricity, then sell it to everyone building the future.** 💡



THE STORY IN TIME

1847

Werner von Siemens & Halske build telegraphs in a Berlin backyard.

1848

They lay one of Europe's first long-distance telegraph lines.

1866

Werner shows the dynamo — making big electricity, cheaply.

1879

The world's first electric railway runs at the Berlin fair.

1881

The first electric tram carries passengers in Berlin.

1896

Helps build one of Europe's first electric underground railways.

1900s

Grows into factory automation, power plants and X-ray machines.

Today

Trains, factory robots, power grids, scanners and digital twins. ⚡

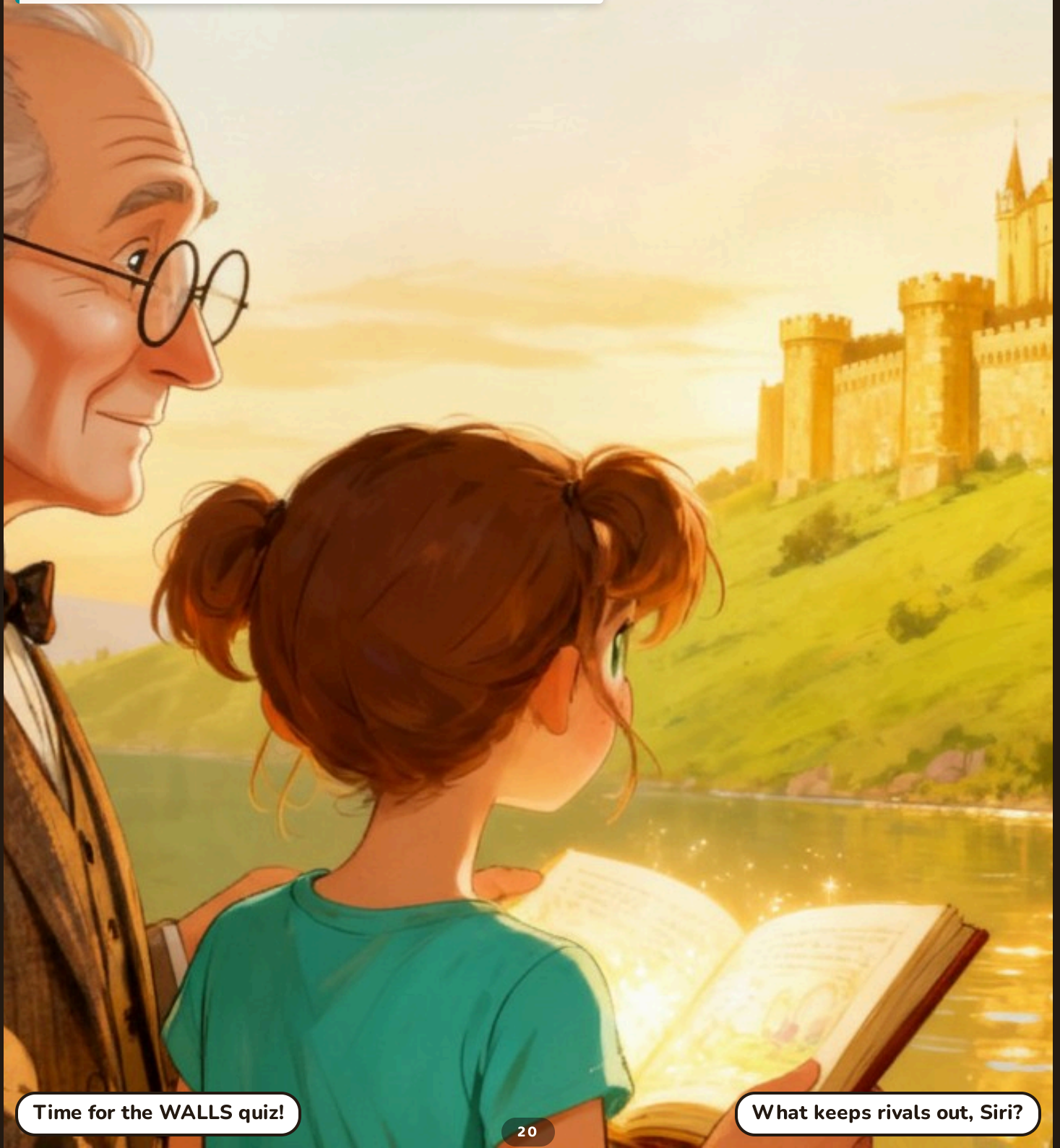


SIRI'S SECRET NOTEBOOK

SIEMENS. Backyard telegraph (1847) → the dynamo (1866) → first electric train (1879) → factories, grids, scanners. Their religion = master electricity, reinvent forever. ⚡

THE CASTLE BUILT TO LAST

A warm glow. A smell of cherry cola. Warren and Charlie, the partners from Omaha, stood before a shining castle.



Time for the WALLS quiz!

What keeps rivals out, Siri?



THE CASTLE WALLS • WHY RIVALS CAN'T COPY IT



Wall One: The 40-Year Handshake

Sell a train, a grid, or a factory, and you service it for decades. Once a customer's world speaks your language, they rarely switch.



Wall Two: A Mountain of Know-How

175 years of hard-won engineering. You can't hire that overnight. Deep patents and standards guard the gate.



Wall Three: A Promise That Can't Fail

When a train, a scanner, or a power grid **MUST NOT** fail, buyers pick the name that never let them down. Trust lets you charge more.



Wall Four: The Everything-Toolkit

They don't sell one gadget — they sell the train **AND** the factory **AND** the grid **AND** the software. Hard to copy all at once.



The Cracks in the Castle

Giant projects can run late and over budget. Rivals abroad are hungry. Different countries use different rail rules. And spending dries up in hard times. Castles need defending — daily.

Charlie tapped his glasses. “My trick: don't ask how to WIN. Ask what would DESTROY it. Then don't do that. **Invert, always invert.**”



Find the ways to lose... then don't!

★ WORTH REMEMBERING

Charlie's checklist for ruining Siemens: over-promise on a giant project. Let the know-how grow old. Cut the research. Bet the whole company on one country. Now — just never do those. Worry, turned into a to-do list. ✓

Warren raised his cola. “A business the modern world can't switch off — trains, hospitals, factories, power. I like castles that stay standing for a century.”



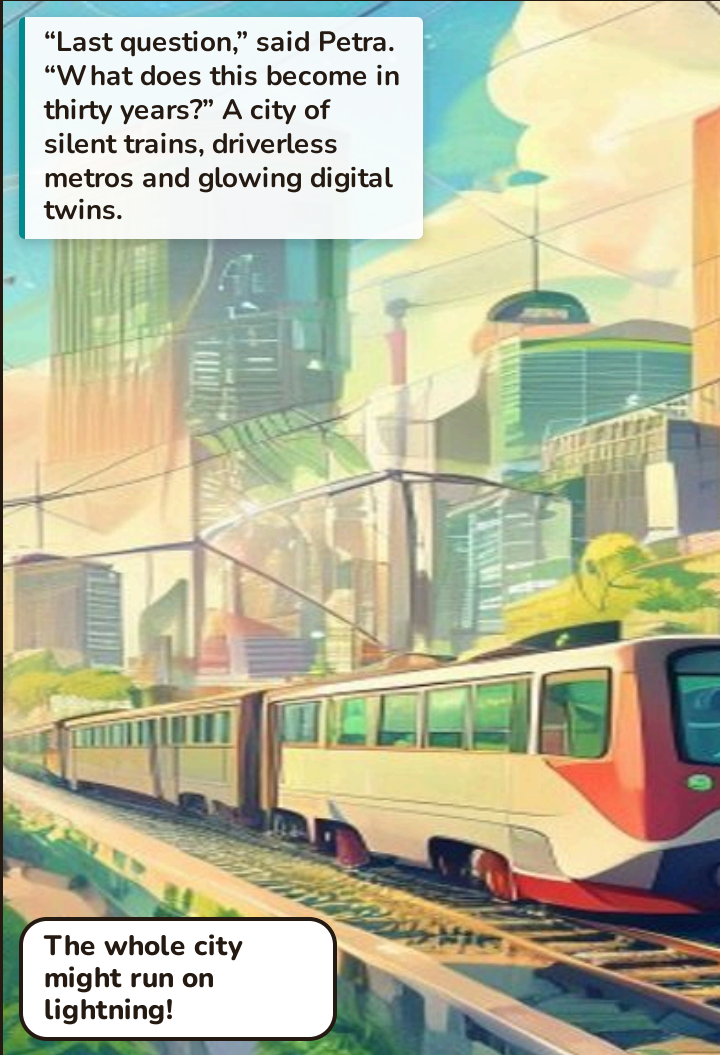
So the treasure isn't the train. It's the WALLS.

SIRI'S SECRET NOTEBOOK

Walls: 40-year handshake 🤝 + know-how 🧠 + kept promise 🛡️ + everything-toolkit 🧰. Cracks: late projects, rivals, mixed rules, hard times. Charlie: INVERT. Warren: buy durability. 🏰

THE NEXT THIRTY YEARS

"Last question," said Petra. "What does this become in thirty years?" A city of silent trains, driverless metros and glowing digital twins.



The whole city might run on lightning!

On a rooftop at dusk, Siri thought it through the way Grandpa taught her.



Don't bet on the train. Bet on the NEEDS.

★ WORTH REMEMBERING

The deep currents: everything going electric — cars, trains, factories; whole cities simulated as digital twins before they're built; smart grids running on sun and wind; maybe trains that float on magnets. Shapes change — but the need to **move, power and build** reliably? Forever. 🌟

📖 SIRI'S SECRET NOTEBOOK

2056 watchlist: electric everything ⚡, driverless trains, digital-twin cities, green grids, floating maglev. Rule: bet on needs, not shapes. (Also: I want to ride the floating train.)

COMING HOME

Her own bed. Morning. The compass: quiet. The house: somehow different.

Was it real? It FELT real...

One fresh line dried on the diary's glowing page.

"The modern world is not magic. It is millions of ordinary people doing small hard things, together, for a long time."

At breakfast, the little model train sat on the shelf. Coils and magnets. A give-back brake. A backyard, 175 years ago.

You're the machine behind the machines.

She hugged the diary tight. Somewhere far away, a silver train glided silently into the morning sun.

Show me the next one, Grandpa. ♥

★ WORTH REMEMBERING

Next time a train slides past, feel it: electricity pretending to be a magnet, spinning giant wheels — then remembering its speed as lightning to share. A train is no longer just a train. **Nothing, from now on, is just anything.**



SIRI'S SECRET NOTEBOOK • WHAT I LEARNED

- ① A motor is electricity pretending to be a magnet.
- ② Motor and generator are the SAME machine.
- ③ Braking gives power back to other trains.
- ④ Steel on steel = almost no friction; cone wheels self-steer.
- ⑤ Nobody knows the whole recipe — companies are conductors.
- ⑥ Reliability is the real treasure.
- ⑦ Invert! And buy durability, not gadgets. 💛



OUR PHILOSOPHY

We believe the greatest gift we can give a child is the ability to think.

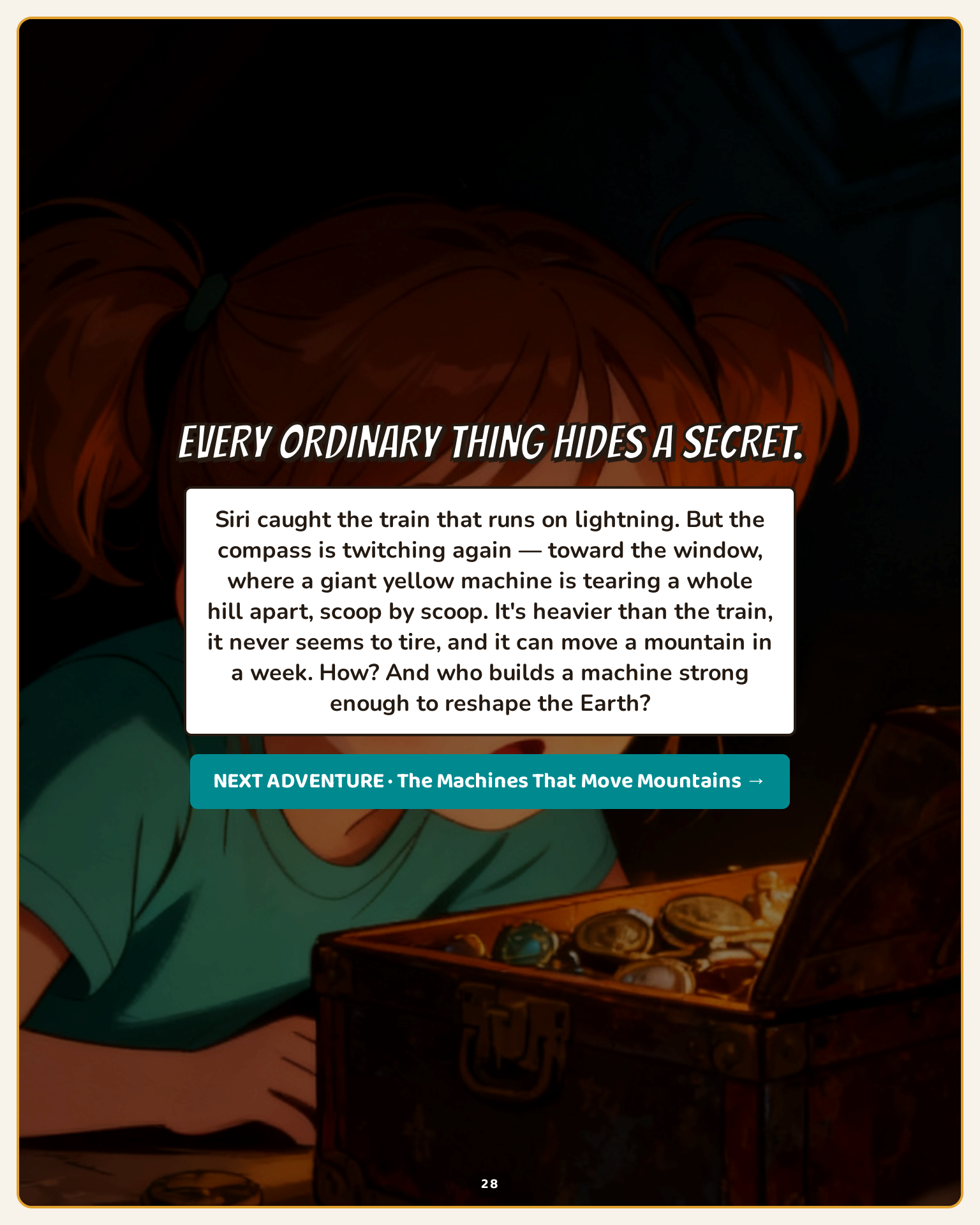
Inspired by the multidisciplinary thinking of **Charlie Munger** and the rational, long-term philosophy of **Warren Buffett**, our comics connect science, technology, business, history, and human behavior to show how the real world works.

Every story begins with a scientific idea and follows its journey into innovation, industry, and the businesses that create value for society. Along the way, children learn that great companies are built on curiosity, experimentation, integrity, and long-term thinking.

Our goal is not to teach children how to invest, but to help them build the mental models needed to understand the world, ask better questions, and think independently.

The companies featured in *The Great Company Adventures* are educational case studies—not investment recommendations. They show how knowledge, innovation, and perseverance turn ideas into products, services, and enduring businesses.

LEARN THE SCIENCE. • UNDERSTAND THE BUSINESS. • THINK FOR LIFE.



EVERY ORDINARY THING HIDES A SECRET.

Siri caught the train that runs on lightning. But the compass is twitching again — toward the window, where a giant yellow machine is tearing a whole hill apart, scoop by scoop. It's heavier than the train, it never seems to tire, and it can move a mountain in a week. How? And who builds a machine strong enough to reshape the Earth?

NEXT ADVENTURE • The Machines That Move Mountains →