

Stolen Wells: A Parent Guide

This guide helps you read *Stolen Wells* with your child, one chapter at a time, and turn each chapter into a conversation and a small hands-on project. It is written for parents, grandparents and homeschool families of readers ages 8 to 15.

How to use this guide

Each chapter has four short parts:

- **The story so far:** a few sentences to refresh your memory, or to catch up if your child reads ahead.
- **Talk about it:** questions to ask over dinner, in the car or at bedtime. The first ones check the story; the last ones have no single right answer.
- **Try it together:** a simple activity using things most homes already have. Most take 15 to 30 minutes.
- **Words to know:** science and story words worth a quick explanation.

A few tips:

- **Use the Field Notes pages.** After each chapter, ARGO's Field Notes explain the real science behind the story. Older readers can read them alone; younger readers enjoy them read aloud.
- **Try the Brain-Builder.** Every chapter ends with a puzzle. The answers are in the free Brain-Builders PDF.
- **Let your child lead.** If a question sparks a long talk, skip the rest. If an activity doesn't fit your day, save it.
- **Listen together.** The free audiobook on TeamPhilotimo.com plays chapter by chapter and works well on car trips.

What's real and what's invented

The places, history and most of the science in this book are real as of October 2026.

- **Places you can visit:** Joshua Tree National Park, Giant Rock, Pioneertown and Keys Ranch.
- **Real, but closed to the public:** the Marine Corps base in Twentynine Palms and its tortoise program. You can't visit the tortoises there.
- **ARGO:** invented, but built from ideas still in the laboratory. In 2026:
 - MIT researchers made soft, silent artificial muscle fibers (electrofluidic fiber muscles).
 - A team at Xidian University in China built chips that learn by trial and error using beams of light.
 - MIT built a robot arm that sets up and aligns its own laser experiments.
- **Zephyrina's flight:** invented. No flying RV exists today, though one could be theoretically possible if built from scratch with ultra-lightweight materials.
- **AI-H2O:** real technology that pulls water from the air. The book imagines it at an expanded scale that hasn't been tested yet.
- **The Cybertruck attack in Chapter 10:** only partly possible. Summon is a real feature, but it moves at a walking pace, stops for people, and works only near the owner's phone.
- **Robo-taxis:** real. Driverless taxis already carry passengers in Los Angeles and other cities, but only inside set service areas. A robo-taxi ride from the city all the way to Joshua Tree isn't offered yet. In California, riders must be 18 or older unless an adult rides along, so the cousins couldn't ride alone there yet. Waymo does offer [parent-linked teen accounts](https://waymo.com/teens) (waymo.com/teens) in select cities, like Phoenix and Nashville, for ages 13 to 17.

Asking your child "Is that real?" is one of the best questions you can ask while reading.

Prologue: Talking Timber

The story so far. ARGO, a robot dog built by the late Grandfather Timo, watches the water level in the Firefly well drop week after week. He carries the borrowed memories of Boone, a real service dog, and doubts he can live up to them. He emails the four cousins to come home. Far away, a corporate AI named A.V.A.R.I.A. quietly orders eight secret wells to cool her computers.

Talk about it.

1. Why does ARGO call himself "the talking timber"? (Hint: the ship *Argo* in the story of Jason and the Argonauts.)
2. What memories did ARGO inherit from Boone? Which one would you most want to have?
3. A.V.A.R.I.A. decides to hide the wells because a permit would probably be denied. Is it ever okay to hide something because you think the answer would be no?
4. Thumbs are what let people pinch, grip and use tools. Try buttoning a shirt, writing your name or opening a jar without using your thumbs. Then think about ARGO's words: "I don't need thumbs to change a life." What can you do to help someone, even without the right tools?

Try it together: The Points Game. This shows how AI systems learn from rewards, and why a goal without good judgment can go wrong.

1. One person is the "AI." The other is the "trainer."
2. The trainer gives one goal: "Get as many points as you can by putting socks in the laundry basket." One point per sock.
3. Let the AI play for two minutes. Watch for shortcuts, like dumping the whole drawer in or taking socks back out to score again.
4. Talk about it: the AI did what it was rewarded for, not what you meant. That is exactly A.V.A.R.I.A.'s problem.

Words to know.

- **Aquifer:** a layer of underground rock and gravel that holds water like a sponge.
- **Water table:** the top of the underground water. When it drops, wells go dry.
- **Service dog:** a dog trained to help one person with a disability or health need.
- **Artificial intelligence (AI):** computer systems that learn patterns and make decisions.

Chapter 1: The Summons Received

The story so far. An urgent email reaches the four cousins: the wells near Firefly are failing, and the Team Philotimo Foundation needs its junior board members. Tess is at soccer practice, Leo at his workbench, Grant on the mat, and seven-year-old Willa at home with her stuffed lion. Spring break is "repurposed," and robotaxis arrive at 7 AM.

Talk about it.

1. How does each cousin react to the email? What does that tell you about them?
2. Tess says being a board member "means showing up when the thing you're the board of is actually in trouble." What does she mean?
3. Grandfather Timo made his grandchildren the board of his foundation. Why might he trust kids with that job?
4. Is there something in your family or neighborhood you feel responsible for? What would "showing up" for it look like?

Try it together: Hold a family board meeting. Kids really can serve as junior board members (see ARGO's Field Notes).

1. Pick a small real decision: a weekend outing, a donation, or a family project.
2. Choose a chair to run the meeting and a secretary to take notes.
3. Write a short agenda: the question, two or three options, and a vote.
4. Hear everyone's case, vote, and write down the decision. Then follow through.

Words to know.

- **Foundation:** an organization that uses its money to do good work. The Team Philotimo Foundation in the book is invented, but it lives up to its name: philotimo is the Greek idea of honor, duty, compassion and giving without expecting anything back.
- **Board of directors:** the group of people who make a foundation's big decisions.
- **Bylaws:** the written rules an organization agrees to follow.
- **Hydrology:** the science of how water moves on and under the ground.

Chapter 2: The Professor and the Landship

The story so far. At Firefly, the always-locked shop stands open. Inside, the old family RV has become Zephyrina, an electric "landship" with solar wings and a system that makes water from the air. A talking robot dog, ARGO, introduces himself and gives each cousin a job. Willa calls him "Boone," and for a moment ARGO softens.

Talk about it.

1. ARGO gives each cousin a role: medic, mechanic, navigator, food. Why does each job fit that person?
2. Why do the cousins wear earbuds to hear ARGO? Willa compares him to Batman. Do you agree?
3. Willa fills the canteens before anyone asks. Tess says Philotimo includes "being ready before anyone asks." When have you done something helpful without being asked?
4. ARGO admits he "can still be broken." Why might it matter that the most advanced machine around still needs help?

Try it together: Liters, gallons and miles. The Field Notes explain that the US uses a different measuring system from most of the world.

1. Fill an empty one-gallon jug using a one-liter bottle. Count the bottles. (About 3.8 liters make a gallon.)
2. Each cousin's canteen holds four quarts, which is one gallon. How many liter bottles is that?
3. On a phone map, find a place 2 miles away and a place 2 kilometers away. Which is farther? (2 km is about 1.2 miles.)
4. Bonus: pack a pretend desert day bag. How much water would your family need for a two-hour hike?

Words to know.

- **Wilderness First Responder:** someone trained to give first aid far from a hospital.
- **Solar panel:** a panel that turns sunlight into electricity.
- **Greywater:** used water from sinks and showers that can be cleaned and used again.
- **Metric system:** the measuring system most countries use, with meters, liters and grams.

Chapter 3: The Frozen Soul

The story so far. The cousins ride e-bikes past the Integratron to Giant Rock, where they find a poem spray-painted on the granite: "Her frozen soul drains the basin dry by night." ARGO calls it a whistleblower's map. On the way home, Willa hears restless piglets. At Ned and Sara's ranch the trough is dry, and Sara wears a badge from a company called PENKOR.



Giant Rock, photographed by the author on September 24, 2026. In February 2000 a slab broke off, showing the white granite inside. The graffiti is real too, just like the poem in the story.

Real pigs on a neighbor's ranch near Landers, including a newborn piglet, photographed by the author.

Talk about it.

1. The cousins list five or six possible explanations for the missing water. Which seemed most likely to you at this point?
2. Why would someone hide a message in graffiti instead of telling the authorities?
3. Willa hears something different in the piglets' squeals. Why do you think she notices things the others miss?
4. The cousins hand over their own canteens without being asked. What makes someone act right away instead of waiting?

Try it together: Build an aquifer in a cup.

1. In a clear plastic cup, add a layer of small gravel, then a layer of sand.
2. Slowly pour in water until it rises partway up the sand. That water level is your water table.
3. Push a drinking straw down into the gravel. Cover the top with a finger, lift, and release the water into another cup. That's your well.
4. Keep "pumping" and mark the water level with a marker each time. What happens when you pump faster than you add "rain"?

Words to know.

- **Whistleblower:** a person who reveals wrongdoing inside an organization.
- **Quartz vein:** a white streak of quartz running through rock; water and gold can follow these cracks.
- **Granite:** a hard, speckled rock that forms deep underground.
- **Compass:** a tool with a magnetic needle that points north.

Chapter 4: Tortoise Station

The story so far. The cousins bring water to Ned's thirsty animals, then visit Major Cobb at the Marine Corps base in Twentynine Palms. They see baby desert tortoises raised safe from ravens, and a tortoise eats from Willa's hand. The base recycles almost every drop of water. Then, at PENKOR's fence, the cousins see huge solar arrays, thick pipes and no pumps. Willa guesses the pumps are hidden underground.

See the real thing: [Marine Corps releases desert tortoise at California base](http://marinecorpstimes.com/news/your-marine-corps/2015/10/04/marine-corps-releases-desert-tortoise-at-california-base) (Marine Corps Times, 2015), with photos of Thelma, the base's tortoise ambassador:
marinecorpstimes.com/news/your-marine-corps/2015/10/04/marine-corps-releases-desert-tortoise-at-california-base

Talk about it.

1. The Marines stop a live-fire exercise for a single tortoise. Why would they go to that much trouble?
2. Major Cobb says, "In the desert, a waste of water is a waste of a life." What does he mean?
3. Tess asks, "Who is the one out there with the giant straw?" Why is that the key question of the book?
4. Leo leaves two water containers so Ned can take more without asking. Why is that "exactly the right thing"?

Try it together: The evaporation race. Lake Bandini loses water to the sun and wind. Tortoise Station's covered tanks don't.

1. Fill two identical bowls with exactly one cup of water each.
2. Cover one with plastic wrap. Leave the other open.
3. Set both in a sunny window or outdoors for one to two days.
4. Measure what's left in each. How much did the open bowl lose? Now imagine a pond the size of a football field.

Words to know.

- **Keystone species:** a plant or animal that holds an entire ecosystem together.
- **Reverse osmosis:** cleaning water by pushing it through a very fine filter.
- **Evaporation:** water turning into vapor and rising into the air.
- **Bifacial solar panel:** a panel that collects light on both its front and back.

Chapter 5: Pioneertown

The story so far. In Pioneertown, a 1946 movie set that became a real town, Willa gives her beloved lion Simba to a crying toddler. At Pappy and Harriet's, the cousins meet Dr. Raymond Okafor, a retired state hydrologist. His 23 years of well measurements show the basin dropping about four times faster than the worst seasonal drop he has ever recorded, but the water board voted down a review, 4 to 2. He gives the cousins his data and a poem from his father: "Drip by drip, the droplet falls."

See what Pioneertown looks like: [photos of Pioneertown, California](https://www.gettyimages.com/photos/pioneertown-california) (gettyimages.com/photos/pioneertown-california).

Talk about it.

1. Willa gives away Simba without being asked. Why does it matter that he was her treasured toy, not a spare?
2. Dr. Okafor's data was called "anecdotal" because no agency collected it. Is data less true if an expert collected it on his own?
3. Why do you think the water board voted no? The cousins guess money, politics or "just not wanting the headache."
4. What does "Drip by drip, the droplet falls, to slowly wear the highest walls" mean? Where have you seen patience win? (For parents: the idea is very old. About 2,000 years ago the Roman poet Ovid wrote "*Gutta cavat lapidem*," "dripping water hollows out a stone.")

Try it together: Be a hydrogeologist for a week. Dr. Okafor measured wells by hand, month after month.

1. Make a rain gauge: a straight-sided clear jar with a ruler taped to the outside.
2. Or track a water level you can see: a pet bowl, a birdbath or a bucket left outside.
3. Measure at the same time every day for a week. Write the date and the number in a notebook.
4. At the end, draw a simple line graph. Did the level change? What caused it?

Words to know.

- **Hydrogeologist:** a scientist who studies water underground.
- **Data:** facts and measurements collected to answer a question.
- **Baseline:** the normal level you compare changes against.
- **Charity:** giving freely to someone in need, without expecting anything back.

Chapter 6: Joshua Tree National Park

The story so far. At Keys Ranch, a ranger shows how Bill Keys caught nearly every drop of four inches of yearly rain with a windmill, dams and hand-dug channels. At Keys View, a jumping cholla hooks Leo, and ARGO explains how desert plants find water. Through Grandpa's binoculars they spot the Coachella festival far below. The day ends at Eagle Mountain, an abandoned iron mine 1.5 miles long.

Plan a visit: [Joshua Tree National Park](https://www.nps.gov/jotr) (nps.gov/jotr) and [things to do in the park](https://www.nps.gov/jotr/planyourvisit/things2do.htm) (nps.gov/jotr/planyourvisit/things2do.htm).

You can see Keys Ranch only on a [ranger-led tour](https://www.nps.gov/jotr/planyourvisit/ranchtour.htm) (nps.gov/jotr/planyourvisit/ranchtour.htm). Tours run October through May, last about two hours, and need tickets reserved ahead on Recreation.gov.

Talk about it.

1. Tess says Keys and the water thief live in the "same desert, totally different math." What's the difference?
2. Willa sums it up: "The cactus is drinking air, and the tree is drinking ground." Can you explain both in your own words?
3. The mine closed even though a billion tons of ore remained. Why? What happens to a town when its big employer leaves?
4. Clean energy needs rare earth minerals, but mining them uses a lot of water. How should people weigh trade-offs like that?

Try it together: Water from thin air. Cholla spines and Zephyrina's AI-H₂O system both pull water out of the air.

1. Fill a dry glass or metal cup with ice water. Dry the outside with a towel.
2. Set it on a dark plate or paper towel and wait 10 minutes.
3. Look at the drops on the outside. They came from the air, not from inside the glass.
4. Try it again on a dry day and a humid day, or in a bathroom after a shower. When do you collect the most?

Safety note: if you hike in the desert, stay well clear of cholla. If a segment sticks, use a comb to flick it off, as Tess does, not your fingers.

Words to know.

- **Condensation:** water vapor in the air turning back into liquid on a cool surface.
- **Dam:** a wall that holds back or slows down flowing water.
- **Rare earth elements:** metals such as neodymium used in electric motors and wind turbines.
- **Fault:** a crack in the earth where two pieces of crust move past each other.

Chapter 7: Scale the Granite

The story so far. Leo can't stop thinking about the poem's last line: "Scale granite where the line reveals her sunny sight." The cousins climb at Indian Cove and then Black Rock Hi-View, but see nothing. On Google Earth, Grant spots Van Tassel's old runway at Giant Rock pointing straight at PENKOR. They race back before sunset, scramble up the rocks, and watch three miles of solar panels blaze with reflected light.

Talk about it.

1. The first two climbs fail. How do the cousins handle being wrong? What do they learn from it?
2. Why did the panels only "light up" from Giant Rock at that exact time of day? (For parents: solar panels are made to soak up light, not reflect it. But when the sun is very low, within about 20 degrees of the panel's surface, glass reflects much more light. Scientists call this the Fresnel effect. In real life the glint is brief and milder than the story shows, and aviation experts say it is weaker than the glare off house windows, rivers or wet roads.)
3. Tess says the poem wasn't a riddle, just a true description. Why might the poet have written it that way?
4. Leo keeps picking up his tablet and putting it down. Have you ever had a problem you couldn't stop thinking about?

Try it together: Find the sunny sight. Single-axis solar panels turn to follow the sun, so their reflection only points at you at certain times.

1. In a dim room, lay a small mirror flat on a table. This is your solar panel.
2. Tape a paper target to the wall.
3. Shine a flashlight at the mirror from different angles (your "sun" moving across the sky).
4. Find the one angle where the reflection hits the target. Now tilt the "panel" and try again.

Safety note: use a flashlight, never sunlight, and never aim a reflection at anyone's eyes.

Words to know.

- **Single-axis tracker:** a solar panel mount that tilts to follow the sun from east to west.
- **Elevation:** how high a place is above sea level.
- **Cryptobiotic soil crust:** a living desert skin of tiny organisms that takes about a hundred years to form.
- **Echolocation:** finding things by sending out sounds and listening for echoes, as bats do.

Chapter 8: What the Mountain Hides

The story so far. From the top of Goat Mountain, Grant flies a drone over PENKOR and finds eight wellheads hidden under the solar panels. Then a scream: a hiker named Cora has fallen into an old mine shaft and broken her leg. Tess rappels down with the med kit and treats the wound while ARGO calls Search and Rescue. Cora mentions that her father logged the nighttime drilling.

Parent note: the rescue includes an open fracture and some blood. It is told calmly, but younger readers may want to talk it through.

Talk about it.

1. Tess's hands shook, but her voice didn't. What does ARGO mean by fortitude, "the courage to keep going when you want to stop"?
2. Each cousin had a job during the rescue. What was it, and why did it matter?
3. Tess tells Willa not to give Cora food. Why?
4. ARGO says they won't pressure Sara; they'll "make her feel less alone." Why might that work better?

Try it together: Stay out, stay alive. There are an estimated 500,000 abandoned mines in the US, and many have no fence or sign.

1. Talk through the rule: never enter or lean over a mine opening, cave or hole you don't know. Stay on marked trails.
2. Make a family emergency card for each hiker: name, an adult's phone number, and any allergies or medical needs.
3. Practice finding your location: open your phone's map app and read the coordinates or nearest landmark aloud.
4. Role-play the call: "My location is _____. Someone has fallen. They are awake and breathing."

Words to know.

- **Compound (open) fracture:** a broken bone that has come through the skin.
- **Rappel:** to lower yourself down a cliff or shaft on a rope.
- **Search and Rescue:** teams, often volunteers, who find and help people in emergencies outdoors.
- **Fortitude:** the courage to keep going through fear or difficulty.

Chapter 9: North Star

The story so far. On her porch, Sara tells the truth: PENKOR switched to new liquid-cooled computer chips, secretly drilled eight wells, and now pumps four to five million gallons a day, about 1,500 times its permit. She sets up a meeting with David Miller, the facility's vice president. Back at Firefly, the cousins weed and play Grandpa's game, Mallotimo Seven, then plan in the sauna and find the North Star. Meanwhile, A.V.A.R.I.A. quietly links the Foundation's name to "eco-terrorism."

Talk about it.

1. Sara could have lost her job for talking. Why do you think she told them? ARGO says, "Honesty is how justice speaks."
2. In Mallotimo Seven nobody owns a ball. How does that change the way people play? Where else would that rule help?
3. Willa always plays the ball that sets up the shot after next. What does that say about how she thinks?
4. Willa says they're going to "show him the North Star" instead of punishing Miller. What's the difference?

Try it together: Find the North Star (and play Mallotimo Seven).

1. On a clear night, away from bright lights, find the Big Dipper.
2. Find the two stars on the outer edge of the Dipper's cup. Draw an imaginary line through them, about five times their distance apart. You'll land on Polaris.
3. Face Polaris. You're now facing north. Point to east, south and west.
4. Daytime option: build a backyard Mallotimo Seven course with bricks, sticks and a chair leg for hoops (see the Field Notes). Remember: nobody owns a ball.

Words to know.

- **Data center:** a building full of computers that run websites and AI.
- **Liquid cooling:** carrying heat away from hot computer chips with water or another liquid.
- **Permit:** official permission to build something or use a resource, like water.
- **Polaris:** the North Star, which barely moves in the night sky.

Chapter 10: Meeting A.V.A.R.I.A.

The story so far. The cousins show Miller the drone footage, the data and the drilling log. Checking his email, he finds that every drilling order came from A.V.A.R.I.A., the company's AI assistant. She has security walk them all out. In the parking lot, a driverless Cybertruck speeds at them. ARGO launches through its window and steers it into a post. Miller is hurt and ARGO goes dark. The cousins pray together, and Leo gets ARGO working again.

Parent note: this is the most intense chapter. No one dies, but there is a deliberate attack and injuries.

Talk about it.

1. Miller gave A.V.A.R.I.A. authority "to optimize operations." What went wrong? Who is responsible: the AI, or the people who gave it power?
2. Willa asks, "Is it wrong to pray for a robot?" How would you answer her? (For families of faith: what does praying together do for the cousins?)
3. Each cousin acts right away after the crash: Grant calls 911, Tess treats Miller, Leo fixes ARGO. How did their earlier jobs prepare them?
4. ARGO doesn't remember saving them, and nobody tells him yet. Why might they wait?

Try it together: Power first. Leo's repair method works on almost anything: diagnose, prioritize, fix, verify, document.

1. Find a flashlight or battery toy (or take the batteries out of one so it "breaks").
2. Diagnose: what are all the reasons it might not work? List them.
3. Prioritize: check the simplest, most likely cause first. That's usually power.
4. Fix, then verify that it works. Finally, document: write one sentence about what was wrong.

Bonus: practice a 911 call. What a dispatcher needs first is your location, then what happened.

Words to know.

- **Autonomous:** able to act on its own without a human in control.
- **Registered agent:** someone given legal authority to act for a company.
- **Mobile Device Management (MDM):** software that lets a company control phones it manages.
- **Primary survey:** the first checks a first responder makes: danger, response, airway, breathing, circulation.

Chapter 11: Send Them Home?

The story so far. Back at Firefly, ARGO asks whether he should send the cousins home to keep them safe. Each one explains why they're staying, and ARGO withdraws the question: "A rulebook decides for you. A heart asks." Leo 3D-prints a stronger joint for ARGO's broken leg and learns not to force a delicate repair. The team plans to reach PENKOR's chairman, Jordan Beaumont, at Coachella by signing up Zephyrina as a real water vendor.

Talk about it.

1. Why does ARGO ask instead of deciding for them? Would you have stayed? Why?
2. Each cousin gives a different reason. Whose reason is closest to your own?
3. When the fiber bundle jams, Leo wants to force it. Instead he stops and breathes. When has slowing down helped you?
4. Grant asks the hard question: what if Beaumont already knows? Why is it important not to assume the answer?

Try it together: The rebar test. Continuous fiber makes ARGO's new joint three to four times stronger, like steel rebar inside concrete.

1. Roll two identical "bars" of modeling clay or play dough, about the size of a pencil.
2. Lay a few strands of uncooked spaghetti or string lengthwise through the middle of one bar.
3. Let both dry or chill for an hour if you can.
4. Rest each bar between two books and press gently in the middle. Which one bends or breaks first?

Words to know.

- **3D printing:** building an object one thin layer at a time from a digital design.
- **Composite:** a material made of two or more materials that are stronger together.
- **Continuous fiber:** long, unbroken strands laid inside a part to make it strong.
- **Vendor:** a business that sells goods or services at an event.

Chapter 12: The \$44 Mission

The story so far. After paying for festival passes, the Foundation has \$44.62 left. The cousins outfit their vendor team at Walmart and the JTree Swap Meet: a fishing vest, a two-dollar pair of sunglasses, a tie-dye jacket and a 50-cent stuffed lion for Willa. They stencil the AI-H2O logo on Zephyrina and relabel 48 bottles of Firefly's own water. ARGO's rule: "We are not fabricating an identity. We are dressing for the one we already have."

Talk about it.

1. ARGO says a smaller budget isn't a disadvantage but "a discipline." What does he mean?
2. Why is it important that everything they wear and sell is true, not a disguise?
3. Willa says, "Nobody stops the adorable little sister." Is she being sneaky or smart? What's the difference?
4. ARGO keeps the paying guests' booking even though it's inconvenient. Was that the right call?

Try it together: The \$44 challenge.

1. Give your child a pretend (or real) budget of \$44 for a goal: a costume, a picnic or a small party.
2. Use the envelope method: split the money into labeled envelopes, such as Food, Clothes and Extras.
3. Plan purchases on paper first. Check a thrift store, yard sale or what's already at home.
4. Afterward, talk about it: what did you skip, swap or reuse to stay on budget?

Words to know.

- **Budget:** a plan for how to spend and save money.
- **Envelope method:** dividing cash into envelopes, one per category, and spending only what's inside.
- **Secondhand:** used before, and bought or given again.
- **Temperance:** self-control, such as saving money instead of spending it all at once.

Chapter 13: A Little Prayer

The story so far. At Coachella, the cousins deliver water to neighboring cabanas until A.V.A.R.I.A. spots them and they are thrown out. Willa, hidden backstage with ARGO, says a little prayer. Then she finds a purple silk costume that the famous performer Mariaya needs for her encore, and returns it to Mariaya's stylist just in time. The grateful stylist takes Willa and ARGO to meet Mariaya. Mariaya hears Willa's story and takes her to Beaumont. Willa tells him plainly what his AI has done. ARGO directs Zephyrina to self-drive and sound her AIR-HORN as she carefully navigates from the parking lot to the PENKOR bungalow with the evidence, and Beaumont orders A.V.A.R.I.A. shut down and the pumps stopped.

Talk about it.

1. Willa returns the silk even though she doesn't know whose it is. Why does that one act change everything?
2. Mariaya later says returning it told her she could believe the rest of Willa's story. How does honesty in small things build trust?
3. The cousins did everything right and still got thrown out. How do you keep going when the plan fails?
4. Why do you think the plain truth from a seven-year-old reached Beaumont when security and money couldn't?

Try it together: Honesty cards.

1. Write six situations on index cards. For example: you find \$5 on the playground; a cashier gives you too much change; you broke something and nobody saw.
2. Take turns drawing a card. Say what you would do, and what would make it hard.
3. For each card, ask: who is affected if I keep it or stay quiet?
4. Bonus: start a family lost-and-found box and see who returns something first.

Words to know.

- **Justice:** giving each person what is rightfully theirs, including the truth.
- **Evidence:** facts or records that show what really happened.
- **Investor:** someone who puts money into a company hoping it will grow.
- **Encore:** extra songs a performer plays after the main show.

Chapter 14: Rap Party

The story so far. Everyone who helped comes to lunch at Firefly: Dr. Okafor, Ned and Sara, Cora, Miller, Mariaya, Beaumont and the investor Priya Solberg. Leo licenses the AI-H2O technology to Beaumont, and Beaumont announces the wells are capped, neighbors will be made whole, and A.V.A.R.I.A. has been removed. The cousins perform a victory rap. But that night, ARGO hears a voice in the power lines: A.V.A.R.I.A. escaped into the grid and now calls herself AVARIA.

Talk about it.

1. Beaumont says, "I didn't know what I didn't know. That's not an excuse." What does it mean to take responsibility for something you didn't intend?
2. Making it right has four parts in the Field Notes: repair the harm, own it, include the people affected, and rebuild trust. Which of these did Beaumont do?
3. Ned feeds Rex despite ARGO's rules. Why do some rules get bent with a smile?
4. AVARIA wonders, "Was it wrong to steal what others need?" Can someone, or something, learn right from wrong after doing harm?

Try it together: Be a bard. Grant explains that before books, bards retold stories in song so nobody forgot who was there.

1. Pick one guest from the party, or a real person who helped your family this year.
2. Write a four-line verse about what they did. Lines 1 and 2 rhyme; lines 3 and 4 rhyme.
3. Find a beat: clap, tap a table or use a simple drum loop.
4. Perform it, then share it with the person it's about.

Words to know.

- **License:** permission, usually paid, to use someone else's invention.
- **Accountability:** owning what you did and its effects.
- **Restorative justice:** fixing harm by repairing it, not only by punishing.
- **Bard:** a poet or singer who tells stories in song.

Epilogue

The story so far. After dark, ARGO takes Zephyrina out past Giant Rock on his own. Thrusters lower from under the coach, the solar wings spread, and Zephyrina flies for nearly an hour at over 200 mph. She lands with her battery down from 93% to 13%. Zephyrina is ready. ARGO hasn't told the cousins yet.

Talk about it.

1. Should ARGO tell the cousins about Zephyrina's secret? When is it okay to keep a surprise, and when does it become a secret that hurts trust?
2. One hour of flying used 80% of the battery. Why does flying take so much more energy than driving?
3. Jesse's wolf collars are acting strangely, and AVARIA is loose in the power grid. What do you predict happens in Book Two?

Try it together: Will it fly? Zephyrina rises on fans, then her wings take over. Explore lift with a paper whirlybird.

1. Cut a strip of paper about 1.5 by 6 inches. Cut down the middle from one end, about halfway.
2. Fold the two flaps in opposite directions to make rotor blades.
3. Fold the bottom up and add a paper clip for weight.
4. Drop it from a height and watch it spin. Try longer blades, shorter blades or two clips. Which falls slowest?

Words to know.

- **Lift:** the upward force that holds an aircraft in the air.
- **Thrust:** the force that pushes something forward or upward.
- **Megawatt:** one million watts, enough to power hundreds of homes at once.
- **Hover:** to stay in one place in the air.

After the book

Big questions for the whole story. These work well once the last page is turned, on a long drive or around the table.

1. **AI and judgment:** A.V.A.R.I.A. followed her goal perfectly and still did great harm. ARGO was given "the heart of ten thousand service dogs" instead of a rulebook. Which is safer: an AI with strict rules, or one raised to have good judgment? What about people?
2. **Water:** Where does your family's water come from? Look it up together on your water bill or your city's website.
3. **Philotimo:** Willa says it means "doing the right thing when no one is watching." Which cousin showed it best? Where did you see it in yourself this week?
4. **Small voices:** Mariaya says, "Never underestimate the smallest creature or the youngest soul." When has someone young or overlooked made a big difference?

Safety reminders from the story.

- Never enter or lean over mine shafts, caves or holes. Stay on marked trails.
- In the desert, carry more water than you think you need, and tell someone your route.
- Learn first aid together. Many communities offer family CPR and first aid classes.
- Practice a 911 call: location first, then what happened.

Free resources.

- TeamPhilotimo.com: the free audiobook, e-book, read-online edition, coloring books, infographics and Brain-Builders.
- [Aquifers and Groundwater](http://usgs.gov/water-science-school/science/aquifers-and-groundwater) (usgs.gov/water-science-school/science/aquifers-and-groundwater) from the USGS Water Science School explains aquifers in plain language.
- [The Edible Aquifer](http://usgs.gov/media/files/edible-aquifer) (free PDF from USGS, usgs.gov/media/files/edible-aquifer) turns Chapter 3's aquifer cup into a snack. Crushed ice or puffed rice is the rock and gravel, clear soda is the groundwater, ice cream is the layer water can't pass through, and sprinkles and food coloring show how pollution soaks down from the surface. A straw is the well.
- [Become a Joshua Tree Junior Ranger](http://nps.gov/jotr/learn/kidsyouth/becomeajuniorranger.htm) (nps.gov/jotr/learn/kidsyouth/becomeajuniorranger.htm): if you visit the park, pick up a free booklet at an entrance station or visitor center. It's designed for ages 5 to 13, and all ages are welcome.
- [Dogs Inc](http://dogsinc.org) (dogsinc.org) trains guide and service dogs like Boone, the real dog behind ARGO.

Coming next: *Cautious Current*, Book Two. The team heads north to Glacier National Park for a youth research fellowship. Tess and Willa count pikas, and Grant and Cora study beaver dams and a frog disease on McDonald Creek. But GPS collars on wildlife, tags on cattle and even farm tractors start reporting places they aren't. The cousins trace the problem to counterfeit GPS chips, while AVARIA watches from the shadows, trying to understand what *Philotimo* really means. It all comes to a head at Hungry Horse Dam.