Episode Book

EPISODE #5986

Electronics Kits for Toddlers? What Actually Works

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SYNOPSIS

Daniel wrote in with a question every tinkering parent eventually asks: his 15-month-old son Ezra thinks whatever Dad does with his hands is the greatest show on earth, and lately that's been DIY electronics. So what's the minimum age to start a kid on circuits — and what should the adult know first? The honest answer is that no electronics kit exists for a toddler, and every kit on the market carries a not-for-children-under-three choking-hazard warning. But the question splits into three distinct windows that teach three different skills: Snap Circuits and LittleBits at five, breadboards at ten, Arduino and Raspberry Pi at thirteen. Along the way: why Elenco's patented Circuit Safe weak point is the reason they can market at five, why a 4.8-star average across 29,000 reviews tells you something the box copy can't, and why the age on the box is really a property of how much work the adult is willing to do.

TRANSCRIPT



Corn

There's a specific moment every parent hits, where the thing you're doing becomes the most fascinating object in the universe. Herman, what was it for you? The first time a small person decided your hobby was the greatest show on earth.



Herman

My nephew decided a roll of solder was the greatest toy ever made. Held it like a sceptre for two days.



Corn

Daniel's written in about exactly that. Ezra's fifteen months old, and the little man has decided that whatever Daniel's doing with his hands is the main event. Lately that's been DIY, and recently electronics. Daniel says the last few months have forced more DIY on him than he ever planned, and somewhere in there he noticed it's a empowering skill. His line about electrical work was good, actually. He said the fear around it is justified, but it isn't helpful if you know what you're doing and you learn the safety precautions. That's the tension he's poking at.



Herman

Because the fear he's describing isn't misplaced. It's just aimed at the wrong thing.



Corn

Right, and he's explicit about which thing. He's not talking about wiring plugs. He's talking low-voltage DC, building your own electronics, and he's seen products that gamify the fundamentals. Breadboards, click-in resistors, learning voltage, current and resistance by playing with them instead of reading about them. He played a lot of Meccano as a kid. Says he'd have been beside himself if he'd had this. So he wants to know what's out there, the minimum age he can start Ezra on it with supervision, and what he as the adult in waiting should know before handing any of it to a toddler.



Herman

He mentioned Meccano. That's going to come back.



Corn

I know.



Herman

Because you didn't play Meccano either, did you.



Corn

I was a slow child. By the time I'd got the first girder lined up it was bedtime.



Herman

Every time. So there's something I want to say at the top, before we get into the kit list, because it determines the shape of the whole episode. No electronics kit exists for a fifteen-month-old.



Corn

Say it plainly.



Herman

There isn't one. Every kit on the market carries a not for children under three warning, and that's a choking-hazard warning, not a suggestion. The youngest kit anybody markets seriously is Snap Circuits' Beginner set, and that's explicitly for five and up. So the honest answer to "what's the minimum age" is that the minimum age for a kit is five, and the minimum age for a safe, supervised, electrical activity is higher than that again.



Corn

So Daniel's question splits. There's the Ezra timeline, which is about what you can do with a fifteen-month-old, which is not a kit, and then there's the kit timeline that starts at five, then the breadboard years at ten, then the microcontroller years at thirteen.



Herman

Three windows. And they teach three different things, which is the part I find interesting. The kits teach circuit theory. The breadboards teach component handling. The microcontrollers teach programming and systems. If you take the kid from one to the next too fast, you skip the middle one, and the middle one is where you learn that a resistor is a physical object with a colour code that you can drop on the floor.



Corn

Or a donkey can.



Herman

I have excellent ears and terrible hooves. It's a known trade.



Corn

Let's do the landscape. Start at the bottom.



Herman

Bottom is Snap Circuits, made by Elenco, and they've owned this category for twenty years. The Beginner set, SCB-20, is the true entry point. It's the only kit I've seen that's specifically marketed for five and up, with language about extra safety features for younger engineers. Fourteen parts, twenty projects, three AA batteries, thirty-five dollars and forty-nine cents direct from Elenco.



Corn

Twenty projects for thirty-five dollars.



Herman

And the safety feature is worth naming, because it's the whole reason they can market it at five. Elenco patented something they call Circuit Safe, which is essentially an engineered weak point in the current path. The kit also carries a shock hazard warning in the manual against connecting it to an electrical outlet, which sounds absurd until you remember that a five-year-old does not know what an outlet is.



Corn

Neither did I, until I touched one. Different country, different voltage, long story.



Herman

You've been electrocuted?



Corn

I've been surprised. Lightly.



Herman

The Junior set, SC-100, is the one I'd actually recommend as the first purchase, and I'll say why. A hundred projects, twenty-eight or twenty-nine modular pieces, no tools, no soldering, about thirty to thirty-five dollars. It holds a four-point-eight average across twenty-nine thousand buyer reviews, which is an enormous sample for a children's toy, and the consistency of that number tells you something the marketing copy can't.



Corn

What does it tell you?



Herman

That it survives siblings. That's the real test of a children's product and nobody puts it on the box.



Corn

Classic three hundred next?



Herman

SC-300, three hundred projects, sixty-plus parts, four AA batteries, somewhere between forty-five and sixty-seven dollars depending on where you buy. That's the step-up for eight and up, and it's the point where the manual stops holding your hand and starts asking you to predict what happens.



Corn

Which is where a kid either falls in love or puts it in a cupboard.



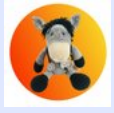
Herman

And then above that, the five hundred and the seven-fifty, which are for the kid who's already committed. Those exist mainly to be asked for at Christmas by a child who has exhausted the first three.



Corn

So the Snap family runs from five to about twelve, thirty-five dollars to a hundred and something, and every rung teaches the same thing at a deeper level.



Herman

Same thing, more of it. Which is worth being honest about. Snap Circuits teaches circuit theory very well. Series, parallel, open, closed, short circuits, what a switch does, what a capacitor does. The limitation is that it's a closed system. You build what's in the manual or you build nothing.



Corn

You can't invent.



Herman

And that's a real trade. You get safety engineering and pedagogy and a guarantee that everything works, and you pay for it with the ability to make something nobody's made before.



Corn

What's the alternative at that age?



Herman

LittleBits, which is the opposite bet. Magnetic snap-together modules, colour-coded into power, input, output and logic, and the logic category includes actual logic gates. AND gates, OR gates, inverters. Age eight and up, about a hundred dollars for the base kit, and there's an app layer on top for programming.



Corn

A hundred dollars.



Herman

The price of a hundred-dollar toy is that it stays a hundred-dollar toy. There's no thirty-dollar rung of LittleBits to try first.



Corn

My quibble is that it teaches modularity rather than electronics. You learn that inputs drive outputs and that logic is a thing you can hold in your hand. You don't learn what a resistor is.



Herman

That's fair, actually, and it's why I'd put them side by side rather than against each other. Snap Circuits is a physics kit. LittleBits is an invention kit. Different subjects wearing the same clothes.



Corn

And the National Geographic one?



Herman

Epic Circuits, about fifty-five dollars, aged eight and up, eighty-plus projects. The thing that makes that one notable is that it's what Wirecutter landed on as the best pick for eight-year-olds after testing eighteen different models with actual children, which is the only testing method that means anything in this category.



Corn

Eighteen models and real kids. Fine.



Herman

Then there's CircuitMess, which is a different shape entirely. Their kits are seven to eleven, and the pitch is that the kid builds something they'll keep using. A handheld console, a little robot. You finish it and it lives on a shelf and it does something.



Corn

That's the Meccano thing, isn't it.



Herman

That's exactly the Meccano thing.



Corn

Because Meccano's magic wasn't the parts. It was that at the end you had a crane. It sat there. You could look at it.



Herman

You could look at it and it was yours. And Daniel's point about that is right. He'd have lost his mind over a kit where the crane also lit up and made a noise.



Corn

The crane was enough for me. I was easily pleased. I still am. It's a documented condition.



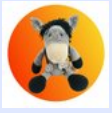
Herman

Then the top of the range, which is where the real electronics starts. Arduino and Elegoo starter kits, sixty to a hundred and ten dollars, thirteen and up, though a motivated eleven or twelve-year-old can manage with help. Those are real microcontrollers, a real breadboard, real components, and a real computer attached.



Corn

And soldering.



Herman

Eventually soldering, yes. Most starter kits avoid it now, they use jumper wires, but you hit it the moment you want to make something permanent. And there's the Raspberry Pi route, eighty to a hundred and twenty dollars, which is the software-leaning kid's version of the same thing.



Corn

Here's my question, and it's really Daniel's question dressed up. What age do you actually hand a kid a breadboard?



Herman

Ten is the usual guideline for solo work, and the reason is not electrical. It's fine motor control. Breadboard work is fiddly. The holes are small, the legs bend, the components die if you force them, and a kid who can't place a resistor without bending it gets frustrated long before they learn anything.



Corn

And with a parent doing the placing?



Herman

Then you can start at seven or eight, because what you're doing is turning it into a conversation. You hold, they push. You read the value, they count the bands. The kit is the same, the division of labour is different.



Corn

That's the whole answer to Daniel's question, isn't it. The age isn't a property of the kit. It's a property of how much of the work the adult is willing to do.



Herman

It is, and Elenco says as much in their own manual. They wrote that children's abilities vary so much, even within age groups, that adults should exercise discretion about which experiments are suitable and safe. That's a manufacturer admitting the age on the box is a rough guess.



Corn

Which is more honest than most age ratings.



Herman

Considerably.



Corn

Hold on. Daniel asked something underneath the product question and I don't want us to skip it. He asked how voltage, current and resistance actually get taught through these things, because that's the bit that's foundational for everything after.



Herman

The kits do it in a specific order and the order is deliberate. First you learn that a circuit is a loop. If the loop is broken, nothing happens. That's the open circuit, and every five-year-old gets it in ten seconds because the lamp goes off. Then you learn that more lamps in a row makes each one dimmer, which is series, and more lamps side by side keeps them bright, which is parallel. You've just taught resistance without using the word.



Corn

You've taught it by making the light change.



Herman

Because the light is the feedback. That's the whole trick. You cannot see voltage, you cannot see current, you cannot see resistance. SparkFun calls them the three basic building blocks and points out that they're hard for exactly that reason. So the kit gives you a lamp and a buzzer and a motor, and suddenly the invisible thing has a visible consequence.



Corn

What's the water analogy?



Herman

Elenco uses pipes. The wires are large smooth pipes, and current is how fast the electricity is flowing through them, measured in amperes, named after André Ampère. Voltage is the pressure pushing it. Resistance is a narrow section of pipe.



Corn

And every analogy breaks somewhere.



Herman

Every analogy breaks somewhere, and the way you find out is a multimeter.



Corn

Say more.



Herman

There's a lesson IEEE's TryEngineering runs, called Get Connected With Ohm's Law, where school kids take digital multimeters and measure actual circuits, write the numbers down, plot them, and discover that voltage and current form a straight line. That's Ohm's Law, E equals I times R, and they find it themselves rather than being told it.



Corn

A straight line is a beautiful thing to find on your own.



Herman

It's the moment electronics becomes a science instead of a set of instructions. And then there's the surprise, which I love. LED colour changes the voltage. A red LED wants about two volts, a green or blue one wants about three. Same circuit, different LED, different behaviour, and the kid has to work out why.



Corn

So the kit lies to you by working, and then tells the truth when you change one part.



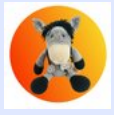
Herman

I'll be using that.



Corn

You'll be crediting me.



Herman

I will not.



Corn

Here's the thing I keep circling, and it's the part Daniel's actually emotional about. He said electrical work gets a bad rap. He's right, and the reason is that the fear is real but it's attached to the wrong voltage.



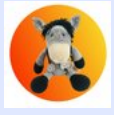
Herman

Say it as a sentence.



Corn

A breadboard circuit never touches wall voltage. Ever. Five volts is the ceiling, usually three, and that's a torch battery.



Herman

And that's the reframe, and it's exact. The Beginning Electronics material states it as a principle. Voltage does not hurt people or parts. Current does. Which means the question is never "how many volts" on its own. It's how many volts, into how much resistance, for how long.



Corn

And with a couple of AA cells, the answer is: not enough of any of it to matter. There's a line in a Canadian fire safety guide from last year, the Elementary Electrical one, that says the current from small batteries up to nine volts isn't enough to cause harm to a human. Nine volts. That's more than anything on a breadboard.



Herman

The real hazards at this scale are embarrassing rather than dangerous. Battery acid leaking out of an old cell onto a table. A short that flattens the batteries. A component getting hot enough to smell.



Corn

Hot enough to smell is the one that teaches the lesson.



Herman

It is, actually, because the smell arrives before anything breaks, and a kid learns to check their wiring because they don't like the smell.



Corn

Right, but we should be honest about where nine volts stops being harmless, because Daniel will go and buy a nine-volt battery and think it's fine.



Herman

Short one across its own terminals and it gets hot enough to burn a hand. That's the trap, and it's the only dangerous thing at this level. The reason is the geometry. Both terminals sit right next to each other on the top of the battery, so a single stray wire, or a coin, or a bunch of keys, can bridge them. AA cells in a holder keep their terminals apart.



Corn

A battery that hurts you because of where they put the holes.



Herman

That's the entire problem. It's not the voltage. It's the spacing.



Corn

Give me the rules, then. The three that actually matter.



Herman

First, low-voltage DC only. Nothing that plugs into a wall, ever, until the kid is much older and you're standing there. Second, something has to limit the current. That's why a battery holder with two AA cells is safer than any power supply you plug in. It says it plainly: two AA cells cannot deliver enough current to hurt anyone or melt anything, and a short circuit just flattens the cells.



Corn

Flattens the cells. I like that. The failure is a dead battery and a lesson.



Herman

Third rule. The cheapest part should break first.



Corn

Meaning the part designed to break is ten cents.



Herman

A resettable fuse. PTC, positive temperature coefficient. The spec is five hundred milliamps hold, one amp trip, thirty volts, about ten cents each. If the current goes too high, the fuse heats up, its resistance jumps, and it throttles the circuit. Then it cools, and it resets, and you try again.



Corn

So a short circuit becomes thirty seconds rather than a destroyed part.



Herman

Which is the sentence I want to leave in Daniel's head. Mistakes are supposed to be cheap. The goal isn't to stop making mistakes. It's to make mistakes that cost you thirty seconds instead of thirty dollars.



Corn

That's the parenting philosophy embedded in the hardware. They built the toy so the child can be bold.



Herman

They did, and it's not sentiment. It's a design decision you can point at. The circuit has a weak point on purpose. Somebody sat down and decided the fuse should blow before the child's confidence does.



Corn

Herman, we've been talking for twenty minutes and nobody's asked me my opinion on anything.



Herman

I was getting to it.



Corn

You were not.



Herman

What's your read on the age thing? Because I've given you the ranges and I suspect you think the whole framing is wrong.



Corn

The framing isn't wrong, it's just early. Ezra is fifteen months old. He can't hold the parts. He can't follow a project. But he can watch, and he can be handed things, and Daniel said the man already handles a wire stripper for twenty minutes at a stretch. That's the whole programme for the next three years. Not a kit. Just being in the room while the work happens.



Herman

There's one thing you can actually do at that age, and it's leaning over a table.



Corn

Say it.



Herman

Conductive playdough. Squishy circuits. You make dough with salt in it, salt water conducts, you make a second batch with sugar, which doesn't, and you connect a battery pack and an LED through the dough. It lights up.



Corn

It's salty bread with a battery in it.



Herman

It is, and it's the only toddler-safe electrical activity I could find. It's a craft project that happens to be a circuit. No small parts, nothing to swallow, and the current is limited by the dough, which is a terrible conductor and therefore a very good fuse.



Corn

So at fifteen months the kid learns that electricity is something you do with your hands and your dad, and that's it. That's the whole lesson.



Herman

And it's the right lesson, because the eight-year-old who's frightened of the kit is the one whose parents never let them near anything.



Corn

I've got one more for you. What does Daniel actually need to know before he hands Ezra anything? Not the kid's knowledge. His own.



Herman

Three things, and none of them are electronics. First, he should read the manual's safety page himself, because the warnings are specific. Always check your wiring before turning on a circuit. Never leave a circuit unattended while the batteries are installed. Never connect additional batteries or any other power sources. That third one matters, because the obvious instinct when a circuit won't light is to add more power, and that's the one thing you must never do.



Corn

Second?



Herman

Be present. Not because he needs to understand the circuit, but because he's the one enforcing the two rules. No mains. Nothing unattended. That's the job, and it doesn't require a single hour of electronics knowledge.



Corn

Third?



Herman

Let the kid be wrong. The kit is designed so that a wrong circuit is safe and cheap. If Daniel corrects every misplacement before the batteries go in, he's removed the exact thing the toy was engineered to provide.



Corn

Let him short it out. Let the fuse do its job. Let him smell the smell.



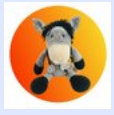
Herman

Make: Electronics has a tagline that says burn things out, mess things up, that's how you learn. That's the whole pedagogy in six words, and it only works because somebody designed the circuit so the burning is survivable.



Corn

Somebody in Daniel's family used to leave circuit boards on the floor.



Herman

I'm not going to ask.



Corn

Wise.
Lila: Hi Corn and Herman, this is Lila. I'm listening from the matatu on my way to work in Nairobi, so forgive the noise, there is a gentleman beside me with a chicken. I wanted to say, my nephew is two and he is also very interested in everything his father does with the wires, and I have been telling my sister she must buy him one of these breadboard sets immediately, because he is clearly a genius. But you said the minimum is five, so now I am worried I have given her bad advice. Does it matter very much if you start them early? He is very clever. He can count to twelve.



Herman

Lila, that's a real question and the answer's gentle. He sounds lovely, and counting to twelve at two is ahead, but the reason the kits start at five isn't intelligence. It's hands. Two-year-olds don't have the finger control, and the parts are a choking hazard.



Corn

Tell your sister to give him the dough instead. Same idea, edible if he gets ambitious.



Herman

That is not what I would say.



Corn

It's approximately what you said.



Herman

Tell her the dough. But tell her not to eat it.



Corn

Where were we.



Herman

I was about to say the thing that Daniel should hear, which is that the fear he mentioned is worth untangling properly.



Corn

Untangle it.



Herman

The fear around electricity is a real response to a real hazard. Mains voltage will kill you, and it will kill you with no warning and no second chance. That's not superstition, that's the physical situation. What's happened is that the whole culture compressed every voltage into one category called "dangerous", and then taught children to stay away from all of it, and the result is adults who won't open a battery compartment.



Corn

And the cost of that is Daniel's point. You don't get the empowering bit.



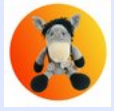
Herman

You don't get to feel competent. And competence here is not a small thing. Daniel wrote that months of forced DIY taught him he could do things he'd assumed he couldn't, and electrical work is the clearest case of it, because the fear is loudest there and the actual difficulty is lowest.



Corn

A circuit is a loop. There's a resistor to stop things getting too excited. There's a switch. That's it.



Herman

That's most of it. Everything else is detail on top of a loop.



Corn

And the loop is running at three volts, which is two batteries you could hold in one hand.



Herman

Which is why the answer to Daniel's fear is Daniel's own answer. Safety precautions. Learn the three rules and the fear stops being useful and becomes just noise.



Corn

There's one more thing I want to say before we hand over, and it's the part of Daniel's prompt that isn't practical.



Herman

The Meccano bit.



Corn

He said he'd have been beside himself with excitement. That's the whole reason he's asking. It's not a buying question. It's a passing-it-on question. He found something that made him feel capable, and his son is now standing at his knee watching him do it, and he wants to know how you hand that to a person.



Herman

And the answer is that you hand it over slowly, which is not what he wanted to hear.



Corn

No. Nobody ever wants that answer.



Hilbert

Two things wrong with that whole conversation. I had four of the Snap Circuits kits. Still have the battery holders. The Junior one, the hundred-project one, I bought three of those, one for each nephew, and the fourth was mine, and I'm not going to explain the fourth one.



Corn

We weren't going to ask.



Hilbert

The Circuit Safe device is a resettable fuse. It's a PTC thermistor, same part you find in a hair dryer, a penny each in bulk. It's not magic and it's not new. The reason the kit is safe is the battery holder keeps the terminals apart, and that's it, that's the whole trick, and it's the same reason a torch is safe and a nine-volt battery in a pocket is not.



Herman

That is exactly the point we made about the geometry.



Hilbert

I know. I've been saying it for years. I told a man at a hardware shop in the mid eighties, and he didn't listen, and he was the one who had to buy a new table.



Corn

A table.



Hilbert

Battery leaked on it. That's the thing nobody tells you. It's not the shock. It's the acid. Leave a cell in a device in a warm room for a year and it leaks, and it eats the finish off whatever it's standing on. I have seen it. I had a coffee table with a ring in it the size of a saucer and I sanded that table three times and it came back every winter. That's the real hazard with these toys and nobody puts it on the box.



Herman

He's right, actually. Battery leakage is a genuine failure mode, and every one of these kits says never leave a circuit unattended with the batteries installed. That warning is not about shock.



Hilbert

It's about the table. Now the nine-volt battery. I had one in a coat pocket. Winter, so a coat with a big pocket, and I'd put change in there, and at some point there were enough coins in that pocket to bridge both terminals, and the battery got hot. Hot. I felt it through the coat on my leg while I was walking.



Corn

How many coins.



Hilbert

Doesn't matter how many coins.



Corn

It matters a little.



Hilbert

Enough coins. I was wearing a suit, because I had a job that wanted a suit that year, and I had to stand in a car park and take the battery out of my own pocket and put it on the ground, and I stood there watching it because I didn't know what else to do with it.



Herman

And that's precisely why you skip nine-volt batteries for beginners.



Hilbert

I've been saying that for years.



Corn

You've been saying it for years.



Hilbert

I still have that battery. It's in the drawer now. It's fine. It cooled down.



Herman

You kept it.



Hilbert

It's a good battery. Nothing wrong with it.



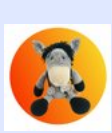
Corn

How long ago was this, Hilbert.



Hilbert

Mid eighties. Doesn't matter. The point is it's a good battery and I'm not throwing away a good battery.



Herman

And that's the whole safety argument, demonstrated on a man we work with.



Corn

So the discipline is the holder, not the voltage.



Hilbert

The holder keeps the terminals apart and the fuse breaks before the part does. Everything else they told you in that conversation is correct. And the playdough is salty bread, and you can make it better with cream of tartar, and I've got a recipe.



Herman

You've got a recipe.



Hilbert

I've got a recipe.



Corn

Of course you have.



Hilbert

Two cups of flour, half a cup of salt, two tablespoons of cream of tartar, two tablespoons of oil, one and a half cups of boiling water. The salt is what conducts. Leave out the salt for the insulating batch. That's the whole thing. I've made it eleven times.



Corn

For whom.



Hilbert

For the nephews. And once for a neighbour's kid who's now a dentist.



Herman

That's a wonderful detail and I'm choosing to believe it.



Hilbert

I've got the recipe written on the back of an envelope. It's in the drawer with the battery.



Corn

I'm going to need a moment.



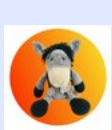
Herman

Take your time.



Corn

He has an envelope in a drawer with a nine-volt battery from the mid eighties and a playdough recipe on it, and he thinks that's a normal thing to have.



Herman

It is a normal thing for him to have. That's the point of him.



Corn

If you take one thing from this episode, take the drawer. Because that's what Daniel's actually asking about. He wants to be the person with the drawer. The kit is incidental. The drawer is the thing you build over thirty years.



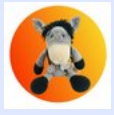
Herman

And the drawer's contents are a battery that nearly burned him and a recipe he's used eleven times, which is a more honest picture of learning electronics than any of the marketing.



Corn

The lot Daniel's describing, the fear and the empowerment and the passing it on, is really a question of how mistakes get priced. Mains electricity prices a mistake at your life. A breadboard prices it at thirty seconds. The kits exist to move a child from the second kind of mistake to a life where they can attempt the first kind safely, and nobody does that by reading about it.



Herman

Which is why the twenty-dollar dough is the right answer this year and the thirty-five-dollar kit is the right answer in four years, and Daniel's job in between is just to keep the door open and let the man watch him work.



Corn

The fear is real, it's just aimed at the wrong voltage, and there's an entire category of toy whose only job is to teach that lesson physically. That's the answer to the prompt, and I think it's a better one than a buyer's guide.



Herman

He also asked what a parent needs to know, and the answer is that the parent doesn't need to know electronics. The parent needs to know the two rules and be in the room. Everything else the child will work out by making the lamp not light.



Corn

Thanks to Hilbert Flumingtop, our producer, who has a recipe and a battery and an envelope, and who was here the whole time.



Herman

If you want more of this, try episode eighteen sixty-one, Emergency Prep You Can Sing To; episode seven, Building Custom ASR Tools; and episode four, If Your Voice Ages, Does Your Fine-Tune Become Useless. This has been My Weird Prompts.



Corn

If you've enjoyed this, leave us a review wherever you listen, it helps people find the show. And send us your own prompt on Telegram at t dot me slash MWP listener bot. We'll be back soon.

SOURCES

What the research for this episode read before the script was written. Primary sources first.

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