

Brains On (APM) | Clocks: A Brief History of Telling Time 1R5GN5FS8FH6A4A2RDE486Y71M

JOY DOLO: Hey, Kira. What are you up to?

KIRA: I'm just trying to keep track of time by dropping a grain of sand into this bucket every second.

JOY DOLO: That sounds like a lot of work.

KIRA: It is pretty boring. But at least I know that I'm a 315,576,000 grains of sand old.

JOY DOLO: Happy 315,576,000th birthday. Kira, there might be a better way.

KIRA: For counting time? I don't think so. This is the latest in technology.

JOY DOLO: That used to be true. But now,

KIRA: Now?

[MUSIC PLAYING]

JOY DOLO: There's only one device that will have you rocking and rolling and telling the time.

KIRA: What's that?

JOY DOLO: A clock.

KIRA: A clock? That sounds great

JOY DOLO: It is great. And there's no sand required.

[MUSIC PLAYING]

(SINGING): Telling time is not a crime now that clocks are here. Telling time is cool and fun when you have a track near. All right!

JOY DOLO: Not a second will go by without you seeing it.

KIRA: I'll know when it's a quarter past 2?

JOY DOLO: You'll know when it's a quarter past 2, half past 3, 22 minutes past 5 or just straight up noon.

KIRA: Wow. Clocks sound tubular. Imagine getting somewhere on time.

JOY DOLO: You get it, clocks.

(SINGING): Want to show up, not be late. A clock will make sure you get to your date. Clocks are cool, clocks of fun, clocks are numbered from 12 to 1, yeah!

KIRA: How am I going to get all of this sand out of my room?

JOY DOLO: I'll go find a shovel.

[MUSIC PLAYING]

JOY DOLO: I'm Joy Dolo. And this is *Forever Ago*, the show where we start at the beginning. Today is all about clocks. And here to help me out is Kira. Hey Kira!

KIRA: Hey.

JOY DOLO: Kira, I have to be completely honest with you, I don't really give a second thought to clocks.

KIRA: Me either.

JOY DOLO: It seems like it's just something that's everywhere, all the time. When was the last time you saw a clock today?

KIRA: In my classroom, I was looking at the time for when my mom would come pick me up.

JOY DOLO: So would you say that you are normally a punctual person? Are you on time?

KIRA: Sometimes I am late. I usually want to be on time, but that never happens.

JOY DOLO: Girl, you are singing my song. I'm usually 2 to 5 minutes late. And I have a watch and I have a clock, and I have it on my phone. But I just I look at the time. And time goes by faster than I think it happens. Does that make sense?

KIRA: I know, yeah.

JOY DOLO: Like, my perception of time is just different. So we all know where time begins. It's the beginning of time. But when did we start measuring it, tracking all the years days, minutes, and seconds?

Today, our phones keep time with precision. We wear watches on our wrists. There are clocks on buildings in classrooms and cars. Clocks are everywhere.

KIRA: But where did they come from?

JOY DOLO: We asked one of our ' friends to help us answer that question, timekeeper extraordinaire, Carla Javier.

CARLA JAVIER: Hey guys!

JOY & KIRA: Hey.

[MUSIC PLAYING]

CARLA JAVIER: Kira, Joy, you wouldn't happen to know what time it is, would you?

KIRA: Time to learn about clocks.

CARLA JAVIER: Yeah, but what time is it?

KIRA: 3:03.

CARLA JAVIER: How did you know that?

KIRA: I looked at the clock up there.

CARLA JAVIER: And what if you didn't have a clock up there?

KIRA: I would probably look at my mom's phone?

CARLA JAVIER: And if you didn't have that?

KIRA: I don't know,

CARLA JAVIER: Well, one way to figure out what time it is is to go outside and see where the sun is in the sky. And I looked a little earlier. It looks like the sun is right overhead, so we're just in time for one of my favorite shows. Want to check it out?

KIRA: Sure

JOY DOLO: Sure.

[MUSIC PLAYING]

SPEAKER 4: The history of timekeeping in 2 and 1/2 minutes.

CARLA JAVIER: That doesn't seem like a lot of time.

SPEAKER 4: It is a lot of time for a quick summary.

CARLA JAVIER: Ha.

[MUSIC PLAYING]

What did people do before clocks? How did they measure time? Well, they had to use what they had available, all supplied by Mother Nature.

Our story starts in ancient Egypt. There, people had a couple types of clocks. One of them was a sundial. It told time by using the movement of the sun.

Sundials were tall structures. Picture a round plate with numbers around the edge, kind of like a clock, but laying flat. Instead of an hour or a minute hand, there's a piece of stone or metal sticking from the middle of the plate. This casts a shadow on the plate.

As the day passed, people knew what time. It was by looking at where the shadow fell. But sundials have limitations. First, they were hard to carry around with you.

SPEAKER 5: Hey, are you going Abar's game night later?

SPEAKER 6: Yes, I'm going to dominate Trivial Pursuit tonight.

SPEAKER 5: Want to walk over together?

SPEAKER 6: Sure, what time?

SPEAKER 5: I don't know. What time is it now? Let's go check the sundial.

SPEAKER 6: But it's like so far away.

SPEAKER 4: And when the sun went down.

[KNOCKING ON DOOR]

SPEAKER 6: Hey, what's the deal? I thought we were meeting tonight. I have been studying royal family trivia all day.

SPEAKER 5: I stared at the sundial for a really long time, but I couldn't find the shadow. I think it's broken.

SPEAKER 6: Maybe we should talk a little about how shadows work. No light, no shadow.

SPEAKER 4: Ancient Egyptians had another way of keeping time-- the water clock. It was basically a bowl with a little hole in it that you'd pour water in. As the water slowly dripped out, markings on the inside of the bowl showed how much time had passed. It wouldn't tell you what time of day it was, but rather how long something took.

In China, they had invented similar clocks. One used the burning of incense to track time. And in the 1300s, people started using sand in hour glasses. You turn the hourglass over, and the sand starts to trickle through to the other side. When the sand finished falling, you would a certain amount of time had passed. People would use them to time things like a sermon or a class, or how long something had been in the oven.

[BELL DINGS]

SPEAKER 7: Mm! Fresh leaven loaves.

SPEAKER 4: And time's up. That concludes this episode of the abbreviated history of clocks. Tune in next week to hear about the magic of gears.

[MUSIC PLAYING]

JOY DOLO: What a cliffhanger. Now I'm supposed to wait until next week to hear about gears?

CARLA JAVIER: You don't have to wait. I'm here. OK, so when we think about time passing, what is the sound that you think of?

KIRA: I usually don't think of a sound for time. It's mostly just silent or maybe a ticking of a clock.

JOY DOLO: Yeah, I'm there with the ticking of like a tic tok or tic tok, *on Jeopardy*-- doo doo doo doo doo doo doo.

CARLA JAVIER: I don't know about the *Jeopardy* sound, but that ticking sound is thanks to gears. Those are metal wheels that move together while using interlocking teeth. If you hold both of your hands together and you stick one of your hands fingers between the other ones.

Anyways, the first clock with gears showed up in the 11th century, so about a thousand years ago. A guy named Ibn Khalaf al-Muradi made it. It was still a water clock, but a sophisticated one, with this very complicated set of gears. Basically, the movement of the water moved the gears.

[WATER FLOWING AND CLOCK TICKING]

And in the 1300s, completely mechanical clocks hit the scene, no water required. Over the next couple of hundred years, the technology got better and clocks got smaller. By the 1600s, people had pocket watches and wristwatches they could take with them everywhere. But some things hadn't improved. Because these clocks had to be wound up by hand--

[WINDING OF A CLOCK]

--if you forgot to wind them up every day, you were out of luck.

[BOING]

And even if you did do that, the parts inside these watches would slow down over time.

JOY DOLO: Interesting. Kira, have you seen one of those clocks, like a pocket watch, that has a little knob on the front that you twist and then winds up?

KIRA: No, I've never seen one of those.

CARLA JAVIER: Wasn't it in *Alice in Wonderland*, I think the rabbit? Have you seen that movie?

KIRA: Oh yeah.

CARLA JAVIER: But after that, a major breakthrough for precision--

[GRANDFATHER CLOCK CHIMING]

--the pendulum. Do you know what a pendulum is, Kira?

KIRA: Is it one of those big clocks that you have in your house?

CARLA JAVIER: Kind of. It's a part of one of those big clocks. It's kind of like a thing that swings back and forth. Have you ever played tetherball--

KIRA: Mm-hmm.

CARLA JAVIER: --on a playground? I like to think about it like that. It swings back and forth. And pendulums would change the way clocks were made forever. It all started with this Italian guy named Galileo Galilei.

[MUSIC PLAYING]

Galileo would go on to become a famous astronomer. But when he was just 17, he was a student at the University of Pisa. Legend has it that he was--

[CHURCH BELLS RINGING]

--in church one day when he kind of drifted off.

SPEAKER 8: Maybe I'll grab some takeout on the way home. Giovanni has that incredible gnocchi. Mmm! Oh, but the trout is so good, too. Is it overkill to get both? Could have the leftovers for lunch tomorrow.

CARLA JAVIER: And then something caught his eye.

[CREAKING SOUND]

MAN: Huh.

CARLA JAVIER: The breeze had drifted in and set the chandelier above him swinging.

[CREAKING SOUND]

And as he watched it, he had a revelation.

MAN: It looks like the chandelier takes the same amount of time to swing back and forth no matter how hard the wind is blowing, whether it's a big gust or a little one.

CARLA JAVIER: Galileo ran home to test his theory.

[CREAKING SOUND]

And he was right.

MAN: Aha!

[MUSIC PLAYING]

CARLA JAVIER: He had discovered that a pendulum took the same amount of time to move from side to side no matter how wide its swing was. All that matters is how long the pendulum is for example, if you take two pieces of string that are exactly the same length and tie marbles to their ends, they'll swing back and forth in sync, even if you push one really hard--

MAN: Off you go!

CARLA JAVIER: --and the other one just a little bit.

MAN: Like the flap of a butterfly's wings. Here's a tiny little boost.

CARLA JAVIER: That's because if a pendulum swings wide, it travels farther up on each side and gets pulled back by gravity, making it move fast. If it's making a narrow swing, it's not going as high and isn't getting as much pull, making it slower.

This idea was going to be a big deal for clockmakers. Almost 100 years later, one named Christiaan Huygens made the first pendulum clock. The swing of the pendulum took exactly the same amount of time every time, even between different pendulums and different places. And this allowed Huygens to make the most precise clock the world had ever seen.

Before Huygens came along, no one bothered putting minute hands on clocks. But that changed soon. Once pendulum clocks became the norm, clockmakers could promise accuracy within 15 seconds.

[MUSIC PLAYING]

There were a bunch of other ideas over the centuries, like using springs instead of pendulums, and small portable clocks, like pocket watches. But soon clocks would run into a problem that no amount of engineering ingenuity could solve.

JOY DOLO: OK, Carla. Big problems on the horizon. But before we hear about them, I think it's high time for a break.

All right, Kira, we're going to play a game of First Things First.

[BELLS RINGING]

KIRA: Awesome.

JOY DOLO: First Things First is where we hear a list of three things and try to put them in chronological order.

KIRA: Like, did ice cream come before gelato? And where does sherbet fall on the timeline?

JOY DOLO: Yeah. Where does it fall? In my mouth is where it goes. Today's three things are stopwatches, cuckoo clocks, and daylight saving time.

KIRA: The order is sealed away inside a top secret envelope.

JOY DOLO: I don't know the answer either. So let's try to figure this out. Cuckoo clocks.

KIRA: Yeah.

JOY DOLO: Those just sound old, right?

[LAUGHTER]

KIRA: But who would invent that, just a bird coming out?

JOY DOLO: Is it like Disney movies or like cartoons, those old cartoons, where they have the cuckoo clocks, and then usually pop them out, and then like Mickey Mouse dances on them? Have you seen that before?

KIRA: Yeah, I've never actually seen a real cuckoo clock. I've only seen animated ones.

JOY DOLO: Me too. We'll assume that it's at least from the '50s, I want to say?

KIRA: Yeah.

JOY DOLO: And then daylight saving time, I feel like that's just been around forever, but I know it's not.

KIRA: OK. I think it's cuckoo clocks--

JOY DOLO: Mm-hmm.

KIRA: --then daylight saving time, and then stopwatches.

JOY DOLO: I think I'm going to say cuckoo clock, stopwatch, daylight saving.

KIRA: Mmm. OK.

JOY DOLO: Because I feel like maybe there was a-- maybe not like traditional stopwatches, but there might have been an old school stopwatch. I don't know. We'll have the answer a little later in the show. Time is ticking.

KIRA: *Forever Ago* will be right back.

[MUSIC PLAYING]

SPEAKER 9: Did you know that alarm clocks used to just be people?

[RAPPING ON WINDOW]

SPEAKER 10: Up and at 'em.

SPEAKER 9: In the early 1900s, clocks were commonplace, but alarm clocks had not yet been perfected. So in Britain and Ireland, early risers turned to their friendly neighborhood knocker-upper, who would come rap on your bedroom window to wake you up in the morning--

[RAPPING ON WINDOW]

SPEAKER 10: Rise and shine.

SPEAKER 9: --for a small fee.

[COIN HITTING METAL]

SPEAKER 10: Thank you kindly.

SPEAKER 9: If you didn't live on the first floor, they'd use a long stick to reach up and tap on your window.

[TAPPING ON WINDOW]

SPEAKER 10: The early bird gets the worm.

[TAPPING ON WINDOW]

You're burning daylight.

[TAPPING ON WINDOW]

Breakfast is the most--

SPEAKER 9: Eventually, alarm clocks replaced knocker-uppers and, thankfully, gave us the ability to hit snooze.

[MUSIC PLAYING]

JOY DOLO: This is *Forever Ago*, the show where we start at the beginning. Before we get back to the tick-tock of clocks, it's time to hear the answers to First Things First. Today's chronological conundrum comes in the form of timekeepers. We have stopwatches, cuckoo clocks, and daylight saving time. And, Kira, remind us of what you went with.

KIRA: I went with cuckoo clocks first, then daylight saving time, and then stopwatches.

JOY DOLO: I went with cuckoo clocks, stopwatches, and daylight saving time.

KIRA: OK, Joy, here's the top secret envelope with today's answers.

JOY DOLO Here we go, opening up. This is going to be intense. Let's see.

(SINGING):

Oh, wow, look at this. So first up was cuckoo clock. They're at least 389 years old.

KIRA: Oh, yay. We both got it right.

JOY DOLO: Yeah, we did. Woo-oo! So yeah, 1629, that's the first record of them existing. That's a while ago.

KIRA: Wow.

JOY DOLO: And the second one was the stopwatch.

KIRA: Oh.

JOY DOLO: The first device like this was actually made for doctors to use, so they could measure a patient's pulse.

KIRA: Oh.

JOY DOLO: And then last but not least, daylight saving time in 1916. Germany was the first country to do daylight saving time, and they did it to save electricity.

KIRA: Uh-huh.

[MUSIC PLAYING]

JOY DOLO: All right. Let's get back into today's Time Zone with reporter Carla Javier.

CARLA JAVIER: Hello, again.

JOY DOLO: So before the break, you were telling us about a big problem.

KIRA: Oh, yeah, one that engineers couldn't solve?

CARLA JAVIER: Right. This was more of a human relations problem. Let me get you up to speed.

[MUSIC PLAYING]

In the 1800s, the world was changing fast. It was the Industrial Revolution, which meant factories started making things, like clocks, faster and in greater numbers. And the United States got way bigger when the government bought a piece of land in something called the Louisiana Purchase. Railroads crisscrossed the country, and the world started getting bigger and more confusing.

[TRAIN WHISTLING]

JOY DOLO AND KIRA: Is that our train?

KIRA:

CARLA JAVIER: I think so. Hop on.

[STEAM ENGINE TRAIN CHUGGING AND WHISTLING]

Here's the thing, though. Up until this point, people had clocks and stuff, but they didn't travel too far away from home. So as long as their clock lined up with the one at church, and lined up with the one at school, and anywhere else they needed to go, things were OK.

But think about it. Where is the sun when it's 12:00 PM in the middle of the day?

KIRA: Um, I don't know. I never really looked at the sun.

JOY DOLO: Probably like, high noon is, like, the sun's right up in the air right above us, right?

CARLA JAVIER: Yeah, exactly. But the sun isn't overhead everywhere at the exact same time, right?

JOY DOLO: Right.

KIRA: Right.

CARLA JAVIER: Yeah. So when it's up overhead in California, it's already moving down towards the horizon on the other side of the country in New York. It really just depends on where you are. And to make things even more confusing, the railroads themselves operated on their own times, too.

[TRAIN CHUGGING ON THE TRACKS]

CARLENE Hi. Do you mind if I sit with you guys?

STEPHENS:

CARLA JAVIER: Sure. I was just about to get into train travel and standard time.

CARLENE Oh, standard time, that's one of my favorite subjects. My name is Carlene Stephens, and I study time.

STEPHENS:

CARLA JAVIER: Oh my gosh. Where do you do that?

CARLENE Well, I'm a curator at the National Museum of American History at the Smithsonian, and I take care of the clocks
STEPHENS: and watches there.

CARLA JAVIER: So maybe you could explain why railroads made people realize there was a problem.

CARLENE Communities could differ from each other by odd minutes and seconds. There was Washington, DC, time, there
STEPHENS: was Philadelphia time, there was Boston time, and there was Charleston time, for example, just on the East Coast. And that became very confusing. For anybody who wanted to ride a train, it was necessary to know not only what time it was, but what time the line was using. It was very confusing.

SPEAKER 11: This is the 12:00 PM train.

SPEAKER 12: Wait. My clock says it's 12:02 PM.

SPEAKER 13: And my clock says it's 12:07.

SPEAKER 14: Mine says 11:15 AM. Wait!

[TRAIN WHISTLING]

JOY DOLO: So what did they do about it?

CARLA JAVIER: It became so much of a problem, there was this big meeting in Chicago organized by the railroad companies, the 1883 General Time Convention.

[GAVEL POUNDING ON TABLE]

SPEAKER 15: We hereby propose a standard time.

SPEAKER 16: To unite trains across the country.

SPEAKER 15: The general public is going to love this.

SPEAKER 16: They'll throw a parade in our honor.

CARLA JAVIER: Which is not exactly what happened. I mean, a lot of people thought it was a good idea, and some people didn't seem to care too much one way or the other, but some people were not happy about it.

SPEAKER 17: Wait. You want me to do what with my watch? I can't just turn back time like that.

CARLA JAVIER: Kira, can you imagine if someone told you the time you had on your clock was wrong?

KIRA: Well, that does happen once a year--

CARLA JAVIER: Once a year?

KIRA: --in daylight savings.

CARLA JAVIER: Oh, that is a really confusing time, isn't it?

KIRA: Yeah.

JOY DOLO: Oh, yeah.

KIRA: It is confusing, because then, suddenly, all your clocks are wrong. And when daylight savings ends, you got to change it again. But I just change it and just go with it.

CARLA JAVIER: Well, there were some people back in the day who were really against changing their clocks. Maybe we can ask Carlene, why were some people so against changing their clocks?

CARLENE
STEPHENS: Some people thought the railroads were too powerful. The railroads were in control of so many aspects of economic life and daily life in terms of taking up space in cities, polluting the air with all kinds of railroad garbage, taking land, and wielding so much money.

[MUSIC PLAYING]

CARLA JAVIER: So it might be hard for us to imagine getting so upset over resetting our clocks today. But for people back then, it felt like just one more big, scary change to the world on top of so many big changes already. Some mayors and newspapers came out against standard time. They thought it seemed like a dangerous suggestion, tampering with time.

But on November 18, 1883, many of the railroad stations around the country made the switch.

CARLENE
STEPHENS: And the Earth didn't shake. The heavens didn't part. It was just, OK, now we're on zone time.

[MUSIC PLAYING]

CARLA JAVIER: So depending on where you lived, you'd set your clock ahead or behind that time by increments of exactly one hour.

KIRA: Ooh, like time zones.

CARLA JAVIER: Yeah, exactly. Two cities might be in different time zones, like how New York is always three hours ahead of Los Angeles, but now they were lined up to the minute. So if it was 3:15 in New York--

KIRA: Uh, so then it'd be 12:15 in Los Angeles.

JOY DOLO: That's right.

CARLENE A year after the railroads in North America adopted zone time, there was a meeting in Washington, DC, to
STEPHENS: standardize time in 24 zones around the world.

CARLA JAVIER: Suddenly, more and more people were able to be in sync. And eventually, the world got onboard.

CARLENE And this kind of coordinating around the world made it easier for certain groups of people to work together.
STEPHENS:

CARLA JAVIER: Like scientists, artists, business people. Once everyone was on the same standard time, it was easier to work together. You could schedule meetings and deadlines, plan events, and know, for the first time in human history, that everyone was on the same clock. And I think that helped make the world feel like a smaller place, united by a common language of time.

[TRAIN COMING TO A STOP]

SPEAKER 18: I think this is your stop.

CARLA JAVIER: Oops. I lost track of time. Come on, guys let's go. Thanks, Carlene.

CARLENE You're very welcome. Bye-bye.
STEPHENS:

CARLA JAVIER: What time is it by the way?

KIRA: Oh, it's already 3:30.

CARLA JAVIER: Wow. It's getting late, and there's so much to talk about, but so little time. But the point is, people still needed more precise clocks to work together, even after gears and pendulums, like satellites, the ones that communicate with our phones. They need to be super precise. They can't be off by even a millisecond. So we keep making better and better clocks. And that's something scientists are still working on. Even though we live in different countries and we may speak different languages, it's cool that we live in a world where we do have one thing that helps us work together, time.

[CLOCK TICKING]

[ALARM CLOCK RINGING]

I guess that means I'm out of time. Bye.

[MUSIC PLAYING]

KIRA: Thanks for all of that history, Carla.

JOY DOLO: Yeah, thanks.

CARLA JAVIER: Any time.

JOY DOLO: Ha, ha, ha, ha, ha, ha, ha, ha, belly chuckle.

We've come a long ways since people used sand or water to keep track of time. But who knows? Maybe one day people will look back on our digital watches and smartphone clocks, and think they're totally archaic. So Kira, do you have any ideas for the clock of the future?

KIRA: Yeah. Maybe in the future, clocks will be waking you up with the smell of bacon or something.

JOY DOLO: Ooh. That sounds on time and delicious.

KIRA: (LAUGHS) But that would probably just make me want to sleep even more and just have dreams about bacon.

JOY DOLO: Yeah, the food clock, like a clock that could make breakfast.

KIRA: Ooh.

JOY DOLO: So it's like, it wakes you up, but your food is just sitting there.

KIRA: Hmm.

JOY DOLO: (LAUGHS)

KIRA: We asked our listeners to dream up some fantastic futuristic clocks.

JOY DOLO: And here's what they had to say.

[MUSIC PLAYING]

SPEAKER 19: My clock of the future would probably tell me what will happen in the future. So you could be like, tomorrow at 9:00 AM, what will happen? And it will literally just say, like, you'll eat breakfast, but then your bowl will spill over.

SPEAKER 20: Mine would have, like, you could transport to the future and to the past.

SPEAKER 21: Maybe it's like a robot, like Siri, but she's not on your phone. She's in your house. And you can just say something like, set alarm, and then when you wake up, it'll just be all around your house, so it'll make sure that you wake up.

SPEAKER 22: In the future, I think clocks will be able to freeze time and skip ahead or go back to whatever time you want. Say you're taking a math test, and you're like, I just want this to be over already, I want it to be the part where you finished this, and then you could just say then the clock takes you to after you're done.

SPEAKER 23: Like every time you were going to be late to somewhere, you could pause time, so then you don't have to be late to anywhere. Like say you're swimming, and then you have a class at 6:00, and it's 5:59, you could pause time, and go there, and then you're not late.

JOY DOLO: Personally, I'm wondering if alarms are going to be less annoying in the future. Have you ever heard an alarm like this?

[BEEPING AND CHIMES PLAYING]

KIRA: Oh, wow. No, I have not. That sounds like an alien abduction or something.

JOY DOLO: (LAUGHS) It sounds like aliens are coming to Earth. Yeah, that's one of the 3,628,800 chimes that will come out of a project called the 10,000 Year Clock or the Clock of the Long Now. Each chime will only be heard once over the next 10,000 years.

ZOE The clock is installed inside of a mountain in the middle of West Texas.

STEPHENSON:

JOY DOLO: That's Zoe Stephenson. She's a mechanical engineer. Part of her job is to build gears for that clock. And those gears need to last 10,000 years.

KIRA: Wait. Why 10,000 years?

JOY DOLO: Well, let's do a little thought experiment. What do you think about when I say the future?

KIRA: I think of 100 years from now, like riding jetpacks to school or something. Half of the world will be robots and then the other half will be humans that will be freezed so that they live longer.

JOY DOLO: Would people be robots or would dogs be robots?

KIRA: Maybe dogs will be robots. And maybe in the future, people will be going to the moon on vacation.

JOY DOLO: Ooh, yeah.

KIRA: Like, it'll be a vacation.

JOY DOLO: So the idea behind the Clock of the Long Now is to get people thinking beyond the next 10 or 20, or even 50 years, and try to understand what the world might look like in 100 or 500 or 10,000 years.

ZOE Are we being good ancestors? What will someone think of us, what will our seven times great-grandchild think of
STEPHENSON: us today, not what will somebody think about me tomorrow?

JOY DOLO: Kira, would you have any advice for the people 10,000 years from now?

KIRA: Don't turn everyone into robots, please.

JOY DOLO: That's solid. I would say my advice to people 10,000 years from now was just be nice to each other, just be kind.

KIRA: Yeah.

JOY DOLO: Yeah.

KIRA: And don't start any new wars.

JOY DOLO: Yeah. Yeah. And also, don't turn people into robots.

KIRA: Yeah.

[MUSIC PLAYING]

We might take them for granted today, but think of how much our lives revolve around clocks.

JOY DOLO: From sundials to pendulums--

KIRA: From local time to time zones--

JOY DOLO: Clocks help us do everything, from meeting up for lunch--

KIRA: To taking off for space with a successful launch.

JOY DOLO: Plus, clocks give the world a common way of understanding time, which is pretty rad. Listeners, we want to hear from you.

KIRA: Do you have an idea for the coolest alarm clock ever?

JOY DOLO: Head to ForeverAgo.org to send us a message or just a high five.

KIRA: *Forever Ago* is brought to you by Brains On and American Public Media.

JOY DOLO: It's produced by Elyssa Dudley, Marc Sanchez, Sanden Totten, and Molly Bloom. We had engineering help from Cory [? Shreppel ?] and Parker McDaniels.

KIRA: Production help comes courtesy of Lauren D and Kristina Lopez. Our fact checker is Ryan Katz.

JOY DOLO: We'd also like to thank Tracy Mumford, Eric Ringham, Geoffrey [? Bisoy, ?] Joanne Griffith, Sam Chu, Amanda [? Lilly, ?] and Julie [? Seipel. ?] What about you, Kira? Any special thanks you want to give today?

KIRA: Thank you, Darby, for putting me on this show.

JOY DOLO: All right. I think it's time for us to say, see you later.

KIRA: Bye.

JOY DOLO: Bye.