

<< THEME >>

SEAN RAMESWARAM (host): Welcome to the final episode of this summer's Today, Explained to kids series.

Where we last left off, our favorite P.I. Izii had another successful case closed. Time to kick back with a glass of ice cold soda and a video game, knowing the job was done well – but, there can be no rest for a PI on Today, Explained to Kids...

[Phone rings]

KIARRA: Aren't you going to answer that?

IZII: Kiarra, I'm on *vacation*.

[Phone rings]

KIARRA: You have like 500 voicemails! What if these kids really need you?

IZII: You know what else needs me? My video games.

[Phone rings]

KIARRA: But don't you miss the thrill of a new case? The rush of a good question? Chasing down answers?

IZII: *[in a reluctant/grumbly way]* Okay, okay, fine... I guess I can take a break from my break. Play the voicemails.

[Beep!]

Piper: How do you get energy from fossil fuels?

Wilder: How does solar power work?

Sydney: How do you convert like – the energy from the sun that comes on a solar panel into the electricity we use to, like, plug in things?

Alex: There are a bunch of different energies that I just need to know about.

[End beep!]

IZII: Huh. Interesting... Very interesting...

KIARRA: I think these kids are onto something... I've heard that fossil fuels are bad – but why? And what *even are* fossil fuels anyhow?

IZII: Sounds like we've got a solid mystery on our hands. And you know what *that* means...

KIARRA: You bet I do! [pause] Wait. What does that mean?

IZII: It means it's time for a visit to our favorite island... the Island of Explained! Come on, just step into my portal here...

<portal sounds>

—

ISLAND OF EXPLAINED - THE AMUSEMENT SPARK

[carnival/amusement park SFX]

KIARRA: Whoa... I didn't know there was an amusement park on the Island of Explained!

IZII: Well, I'm supposed to be on vacation – so if I'm gonna work, I'm also gonna have some fun.

TIME GUIDE: Welcome to Amusement *Spark* – the best place to have fun and learn!

IZII: The Amusement Spark *sparks* your interest in things by making them exciting. And I bet they have a ride that can answer our questions...

KIARRA: But what kind of ride will be able to teach us about fossil fuels and why they're bad?

TIME GUIDE: Have you ever asked yourself, *what are fossil fuels and why are they bad?* Well, then, step right up to our newest ride – It's an Old World!

Fossil fuels – AKA coal, oil, and natural gas – are actually some of the *oldest* things on Earth. So "It's an Old World" will take you back in time to tell you everything you need to know.

IZII: That sounds perfect! And look – there are two seats left!

KIARRA: I hope this isn't a *scary* ride... Ah! We're moving!

[Coaster clacks/time warp SFX]

TIME GUIDE: Welcome... to It's an Old World! I'm Doc, your brave and wise Time Guide. Sit back and relax as we journey back to a time before humans...

... before Neanderthals...

And even before *dinosaurs*. Behold – our first stop!

KIARRA: Hm... What exactly are we looking at here? All I see is a swampy-looking forest...

IZII: But wait. This looks different from a regular forest. I've never seen so many giant ferns in my life...

KIARRA: Oh yeah... And look at those super tall trees.. Their bark looks all scaly, like snakeskin!

IZII: And is that... A MILLIPEDE AS LONG AS THIS CART?

TIME GUIDE: Oh yeah, that's Milly. Hi, Milly!

MILLY [teeny voice]: Sup, Doc!

KIARRA: Where are we??

TIME GUIDE: I think you mean WHEN are we. Welcome to the Carboniferous period! We've journeyed to a time before humans – approximately 300 million years ago. You might not believe it... but all of these giant trees and ferns and plants? They're the earliest forms of fossil fuels. Now, as we move forward in time...

KIARRA: Ahhh, we're going fast now!

IZII: Ooo, the plants are wilting... and look, all that sand and dirt is blowing over them... covering them up!

TIME GUIDE: Yup. We're moving through millions of years now. Think of how many storms and floods and earthquakes happen over the course of millions of years...

KIARRA: My guess is a LOT.

TIME GUIDE: A LOT a lot. And all of that changes the surface of the Earth. Rocks break down, places flood, sand and dirt blows in... And each new layer settles on top of the buried plants and animals.

Through those millions of years, one layer forms, then another, and another, and another....

IZII: It looks like dirt lasagna!

KIARRA: Gross...

TIME GUIDE: Those layers add a ton of pressure, SQUISHING and CRUSHING what's left of those plants. And this process is happening in swamps and forests *all across* the planet. The plants die, then get buried as the surface of the Earth changes...

And the same thing is happening to plankton in the ocean too!

... New layers of sand and water and dirt keep forming and pressing down on these plants and animals for a million years... Then another million... Then *hundreds* of millions of years...

KIARRA: We're going *even* faster now! Izii, hold my hand!

IZII: [ignoring her] Look – dinosaurs! ... Ooo, and now everything's freezing over – this must be the Ice Age...

KIARRA: Oh and now look – humans!!

TIME GUIDE: Over these millions of years, the pressure from those layers – plus heat from the earth's core – TRANSFORMS our plants and animals. Some of the material becomes shiny black rocks – we call that coal. Other times, there's so much heat and pressure that it transforms into a liquid that we call crude oil. Or, if there's a TON of heat and pressure, we get a gas – natural gas!

KIARRA: Wow. Love a good transformation story!

TIME GUIDE: These three things are all versions of what we call fossil fuels. The “fossil” part is just because they're made from really, really old stuff... And the “fuel” part is because we use them to make power.

In fact, it turns out that burning fossil fuels is a really powerful source of energy. Which brings us to our next stop on this ride...

... The late 1700s.

IZII: Wow, look! Trains... Steamboats...

KIARRA: And factories to build *more* trains and *more* steamboats...

TIME GUIDE: Right. This is what we call the Industrial Revolution. Humans started to build factories and invent machines that depended on burning fossil fuels. In another hundred years or so...

[coaster/car horns SFX]

... Cars powered by fossil fuels come on the scene. And around the same time, people start burning coal to make ELECTRICITY.

KIARRA: So you're telling me that the giant ferns and plants and plankton we saw hundreds of millions of years ago – *those* power stuff like our air conditioning and phones–

IZII: And video games?!

TIME GUIDE: You bet. In fact, more than half of all the electricity used in the U.S. today comes from burning fossil fuels – not just coal, but natural gas, too.

IZII: Okay, this is fascinating and all – but my P.I.-senses are tingling. Something's not adding up here!

KIARRA: What do you mean?

IZII: Well, the Time Guide said this ride would show us why fossil fuels are bad... But so far, we've only seen what makes them *good*. So, why are they bad?

TIME GUIDE: Ah... That is an excellent question. If you all reach under your seats, you'll find a special pair of goggles... Please put those on.

KIARRA: Oo, mad scientist vibes.. I like it!

IZII: Whoa... What's all this stuff in the air?

TIME GUIDE: So these goggles let you see something that's *usually* invisible – a gas called carbon dioxide.

Remember how fossil fuels include the remains of a bunch of plants and animals pressed together over a really long time? Well, those plants and animals contained A LOT of different chemicals – including carbon.

That means, when humans burn fossil fuels, it creates carbon dioxide – sometimes we call that CO₂. That's what you're seeing in the air now.

KIARRA: Uh oh. Is *that* what's bad?

TIME GUIDE: Well... It's not *good*. See how the carbon dioxide is floating up and forming a layer in the sky? That wraps alllll around the planet like a blanket. And just like a real blanket, it traps in heat, making the surface of the Earth hotter.

As more carbon dioxide is released, that blanket keeps getting heavier, and heavier... Which makes the Earth even warmer.

KIARRA: So... The more fossil fuels we burn, the more of this carbon dioxide we have..

IZII: ... And the more carbon dioxide we have, the hotter our planet gets?

TIME GUIDE: Exactly. This is part of what scientists call “climate change.” Burning fossil fuels isn’t the *only* contributor to climate change... But it’s a pretty big one.

Today, the earth is around 2 degrees Fahrenheit warmer than it was in the 1800s.

KIARRA: Okay... But why is it bad if the planet gets a little bit hotter?

TIME GUIDE: Well, 2 degrees might not sound like much. But even a *small* rise in temperature comes with BIG effects – like rising sea levels, or serious heat waves, or more wildfires and more storms.

KIARRA: But Doc... It seems like we still use a ton of fossil fuels. You said it yourself – more than half of the electricity we use at home comes from burning fossil fuels... So what happens if we keep using them so much?

[big clang/screech of brakes]

KIARRA: Ah! Why did we stop?!

IZII: Huh... I think we’ve reached OUR time. As in, present day, 2022.

TIME GUIDE: My dear riders... We are now at a crossroads. And YOU get to choose where we go next. To the right: A future without fossil fuels. To the Left: Fossil Fuels Future. So basically, what the future will look like if we keep using fossil fuels at our current rate... Which will you choose?

[ticking clock SFX]

IZII: I do NOT have a good feeling about Fossil Fuels Future...

KIARRA: But what else do we have BESIDES fossil fuels? I’m not ready to give up everything that uses electricity...

IZII: I'm not sure, but I don't like the idea of all those chemicals in the sky.

[alarm SFX]

TIME GUIDE: Ooops! You waited too long. Here we go!

KIARRA: We're moving towards Fossil Fuels Future!

TIME GUIDE: Climate change is affecting snow and rain patterns...

... More places are having droughts...

... The ocean is getting warmer, which is causing more powerful hurricanes and dangerous storms...

... Different plants and animals are losing their habitats...

... And if average global temperatures rise by more than 2.7 degrees Fahrenheit compared to pre-industrial times... Then things could get bad. *Really* bad.

KIARRA: I'm too scared to look anymore! Can we go back??

IZII: Well, there's a button here: Magical Emergency Rewind, for emergencies ONLY. I wonder what it does...

KIARRA: Press it! Press the button!

IZII: I don't know...

KIARRA: IZII, PLEASE PRESS IT NOW!

[Rewind noises]

IZII + KIARRA: Whoa!!

SEAN: Will Izii and Kiarra be saved by the magical rewind button? Or is it too late? Find out after this short break.

[MIDROLL]

—

SEAN: We're back on the Island of Explained with Kiarra and Izii. They just pressed the magical emergency rewind button, and now they're having a spot of deja vu...

[big clang/screech of brakes SFX]

KIARRA: Um... Am I losing my mind, or were we just here?

IZII: You're not losing your mind. I think that magical rewind button really worked! Look... There's the same fork in the road, with the sign pointing to Fossil Fuels Future. And if I remember correctly, Doc is about to tell us that we're at a crossroads.

TIME GUIDE: My dear riders... We are now at a crossroads. And YOU get to choose where we go next. To the right: A future without fossil fuels. To the Left: Fossil Fuels Future. So basically, what the future will look like if we keep using fossil fuels at our current rate... Which will you choose?

KIARRA: RIGHT! Let's go right – to the future WITHOUT fossil fuels!

TIME GUIDE: Huh, I love your enthusiasm. I was going to suggest going left... But okay! Right it is! We're leaving Amusement Spark and heading to the most amazing city on the Island of Explained... ELECTRI-CITY!

IZII: Oo, the track is so high up, we can see the whole city under us! Look at all the trees... And the parks... And the bike lanes...

KIARRA: Okay, I'm liking this a LOT more!

IZII: Huh, I'm curious, though... I wonder if there's also bad stuff in the air here that we just can't see. Let me put on those special CO2 goggles again...

KIARRA: Ooo, me too.

IZII: Hm, I barely see any carbon dioxide in the air... Do you?

KIARRA: Nope. But the city still seems to be running on electricity. Look, I see air conditioners... refrigerators... TVs...

IZII: How is that possible?

TIME GUIDE: Ah, here comes the mayor of Electri-city, on her hoverboard!

MAYOR: Hiiii! Or should I say.... Hy-dro! Water is one of our main power sources here.

TIME GUIDE: Electri-city actually doesn't use ANY fossil fuels at all.

IZII: Not *any*??

MAYOR: None! Lemme point out the energy sources we DO use. Like.... Oh! See those shiny blue panels on the roofs of the buildings? Those are solar panels. They're made up of a special type of solar cell that turns sunlight into electricity. We also have a wind farm over on your left...

KIARRA: Those are some BIG windmills.

MAYOR: The wind spins the blades, which spin a generator – and that creates electricity. Let's see, what else... Oh! We also have a nuclear power plant, which you'll see over on your right. Look for the big curvy towers with steam coming out of the tops...

KIARRA: Ooo, I see them!

MAYOR: Our city also uses a bunch of sources that you CAN'T see. Like geothermal energy, which uses the heat from the earth's core. Or different types of biomass, which come from plants and animals... Our scientists are even experimenting with making power from algae photosynthesis!

IZII: Algae? That slimy green stuff in Deep Dive Lake? Good to know it's useful for something!

MAYOR: All of our energy sources produce way less carbon dioxide than fossil fuels. But that's not all. Most of them are also *renewable* – which means we can easily replace what we use. There will always be more wind or sun, and we can grow more trees.

Fossil fuels, on the other hand, are NON-renewable. Since those take hundreds of millions of years to form, we can't exactly make more.

KIARRA: But wait! If these sources of energy are so much BETTER than fossil fuels... Why isn't every city like *your* city? Why does most of our energy at home still come from fossil fuels?

MAYOR: Great question.

TIME GUIDE: *Fabulous* question. Listen, the world is a BIG place – unlike our Island! So cities or towns that use the most energy aren't always the sunniest or windiest places. *That* means you need a way to get energy from the places with the most – to the places that NEED it the most.

MAYOR: We also have it a bit easier here, because it's almost always sunny and almost always breezy. So we don't have to worry about making batteries to store energy for cloudy days, or days without wind.

TIME GUIDE: There's also the matter of money.

MAYOR: And politics.

TIME GUIDE: *Definitely* politics.

KIARRA: This all sounds IMPOSSIBLE!

MAYOR + TIME GUIDE: [gasps]

TIME GUIDE: Not the “I”-word!!

KIARRA: What? What’s so bad about the word “impossible”?

TIME GUIDE: Please... No more...

MAYOR: Of all the things you need to make big changes... One of the most important is BELIEF.

TIME GUIDE: If you don’t *believe* that change is possible... You’ll never try! And if you never try, then things will never change.

MAYOR: Right. Because let me tell you a secret... [loud whisper] My city, Electri-city – we used to use fossil fuels, too.

KIARRA: Really? YOU used fossil fuels, too??

MAYOR: Yup. And switching to clean energy was really, really hard. It almost felt... well, *impossible*. A lot of people here were used to doing things a certain way. And some residents owned or worked in fossil fuel factories, and they didn’t want those factories to close.

IZII: So... what changed?

MAYOR: Well, we started to understand just how bad these fossil fuels were for the environment. And we all realized that we had to change if we wanted to avoid Fossil Fuels Future. So it took some time...

TIME GUIDE: A LOT of time.

MAYOR: And some effort...

TIME GUIDE: A LOT of effort.

MAYOR: But once we started making small switches, like adding just a few solar panels at a time, we realized it wasn’t so scary. And, that’s not all... This could just be the BEGINNING.

TIME GUIDE: Ah, what an excellent segue to the very last part of our ride. Thanks, Mayor! Back we go into Amusement Spark.

KIARRA: Bye, mayor!

MAYOR: Bye! Or should I say... Biomass?

TIME GUIDE: We're almost at the end of the ride... But before we close our loop, I want to take you all EVEN FURTHER forward into the future! This is a BRAND NEW part of the ride that I'm still kinda working on...

[TIME WARP SFX]

IZII + KIARRA: WHOAA!!

TIME GUIDE: Welcome... to the year 3022! In the great city of Greenville.

IZII: Wow... Is that a *rocket ship*?

KIARRA: It's a whole bunch of them!

TIME GUIDE: Oh, that's the local rocket port. Not only did the citizens of Greenville figure out how to use ALGAE photosynthesis for electricity... They figured out how to channel ALL photosynthesis into electricity. Now, every park and garden generates enough electricity to power rockets to the moon. Ah, there goes one now...

IZII: And what are those over there? The pretty bird-looking things..

TIME GUIDE: Oh, those are wind energy kites. Instead of huge wind turbines that take a long time to build, you can fly those kites whenever and wherever there's wind!

Oh, and see those people dancing over there? They're having a piezo-electric-thon. The special street material absorbs the pressure from their dancing and turns it into electricity!

IZII: That's *my* kind of party.

KIARRA: What about those roller coasters over there? What do those do?

TIME GUIDE: Oh, those are just regular roller coasters. For some reason, the people here are really into roller coasters...

KIARRA: This is pretty awesome. But it all looks so different from back home... How will we ever get here?

TIME GUIDE: Well, like the Mayor of Electri-city said: change is hard! But if you believe that it's possible, then imagination and invention can take you a long way. After all, you need to *imagine* a new world before you can make it. In fact, there's a whole section of Greenville devoted to imagining new inventions. Let's listen in...

Liv: I wonder if they can make like a lighter windmill, that could like – that you could like put on like your roof 'cause it'd be like lighter, it wouldn't be that heavy.

IZII: Oo! That would make a great addition to my office.

KIARRA: I thought you were on vacation?

IZII: Consider my vacation officially over. There's too much to do!

TIME GUIDE: Here we are... Back at the start of the ride. But before you go – would you mind if I record a review from you? I like to see if our little ride here changed peoples' minds...

Here, let me play you some reviews I've gotten from other riders in the past. I asked them if they want to work towards a future FREE of fossil fuels, in order to take better care of the planet. And they've said stuff like...

Gaspare + Wilder: Yes, definitely!

Piper: This is what we live on and what our kids will live on, if you have kids...

Gaspare: It's beautiful!

Wilder: Beautiful stuff...

Sydney: We have to make sure we have this planet. 'Cause it's the only one we've got! We don't have a plan B.

KIARRA: Well, I'm with those people. I can't wait to get home and start researching solar panels. I feel like I could probably talk my parents into getting some...

IZII: And I want to start the first green private-eye practice in my city!

KIARRA: I guess we better get back to the office, Izii... We have a lot of clients to call.

IZII: "We"?

KIARRA: Come on... Every successful private-eye needs a partner.

IZII: How about we start with sidekick and go from there?

KIARRA: Done.

–

CREDITS: This episode was produced by Daphne Chen. The team at Transmitter Media includes Shoshi Shmulovitz, Isabel Carter, Kiarra Powell, and Sara Nics. The team at Vox includes Noam Hassenfeld, Byrd Pinkerton, and Jillian Weinberger. Our executive producers are Gretta Cohn and Katherine Wells. Meral Agish is our fact checker. Sophia Lanman sound designed and mixed the series.

Special thanks to our voicemail leavers, inventors, and roller coaster riders: Alex, Gaspare, Liv, Piper, Sydney, and Wilder. You can hear all of our episodes, and find related activities, at vox.com/today-explained-to-kids.

Oh, and by the way – Piper has a message for all you adults listening too.

Piper: Could you please stop messing up the planet, maybe, like, a little bit? That would be nice.