Podcast**:** Imagine This

Episode Title: BONUS: Weather in the Imaginarium!

Duration: 10’ 10”

*[ABC Kids podcast sting – This is an ABC podcast]*

*[Curious classical music]*

**Nij:** Hello! I’m Nij. Welcome back to the Imaginarium! This is the place where all your amazing questions arrive, and I get to read every single one and work out how to answer them.

*[Footsteps moving across the room, past whirring and beeping machines, buzzing and bubbling. We’re inside a lab.]*

**Nij:** Questions about science or space, forests or oceans, bugs or the body! Gee, you have been busy questioning *everything*! So, I’ve been keeping them organised in this filing cabinet.

*[Taps on metal cabinet]*

**Nij:** I’ve been popping insect questions up here –

*[Clank of filing cabinet draw sliding open]*

**Kid 1:** How do bees make honey?

*[Swarm of bees escape the drawer]*

**Nij:** Oh, that was a fun one! There’re tonnes in here.

*[Flicking through folders in the drawer]*

**Kid 2:** How do spiders stick to walls?

**Kid 1:** Do caterpillars always turn into butterflies?

**Kid 2:** How do grasshoppers jump so high?

**Nij:** And in this one we have all the questions about the ocean!

*[Drawer opens and water splashes onto floor]*

**Nij:** Woops! Watch your toes.

But this is the drawer I wanted to open today. We’ve been sent a lot of questions about the weather, so today, I thought we could try our best to answer not just one weather question, but as many as possible! Let’s see here…

*[Wiggling drawer handle, sound of straining metal]*

**Nij:** It’s stuck

*[Nij strains, but drawer doesn’t budge]*

**Nij:** Oh no, the questions about snow must have frozen it shut. Good thing Nate Byrne is on his way. Nate’s a meteorologist – that’s a weather expert. Maybe he can give me a hand.

*[Music ends with a positive flourish]*

*[Lab doorbell chimes and robotic voice speaks]*

**Robot:** Dr Nij, your meteorologist has arrived

**Nij:** Good timing!

*[Lab door slides open]*

**Nij:** Hey Nate

**Nate:** Hi Nij!

**Nij:** Thanks for coming to the Imaginarium. We have *lots* ofweather questions to ask you but they’re all frozen shut in this drawer!

**Nate:** Maybe if we work together, we can get it open.

**Nij:** Okay, one, two, three. Pull!

*[Both pull, ice cracks. Metal strains and buckles before blasting open with a gust of wind]*

**Nate:** Woah

**Nij:** There are some wild weather questions in here!

*[Classical music starts]*

**Kid 1:** I want to know, how is the wind made?

**Nate:** Hmm wind. Well, this might not make sense at first, but wind is actually made by the sun!

**Nij:** What!?

**Nate:** Every day the sun shines down on us. Even on a cloudy day, the sun is still shining on Earth. As it beams down, it heats up the ground. If you’ve ever run around barefoot in summer, you’ll know the ground can get pretty hot…

**Nij:** Oh yes ouch!

**Nate:** So, once the ground is warmed up, the air above the ground gets warmed up too. Once the air gets hot enough, it starts to rise up higher and higher into the sky.

**Nij:** Is that what wind is? Hot air rising up from the ground?

**Nate:** Not quite. The hot air rises up and moves toward the sky. But what happens then, is there’s a space left behind. Now all the air *around* that empty warm spot, rushes in to fill the space up. And *that* is wind!

**Nij:** But it can get very windy on cold days, like in winter. How is the wind made then?

**Nate:** Well, even when it’s cold, air that’s just a little bit warmer still rises. So even if it's super freezing cold in one spot - if there's somewhere next to it that's just a tiny bit warmer - but still really cold - that'd be enough to make wind. Also, remember wind can travel long distances so it could move from a hot place to a cold place.

**Nij:** Like how far?

**Nate:** Really, really far. Like from the south pole all the way to the middle of Australia. Or from Australia all the way over to New Zealand.

*[Whoosh of wind blows out all the questions, sound of paper fluttering around]*

**Nij:** Oh quick! Catch a question!

**Nate:** Here’s two!

**Kid 2:** Why are there seasons with different weather?

**Kid 1:** My name’s Manan and I want to know, why are the days in winter shorter?

**Nate:** Good one, and you know what? Both of those questions have the exact same answer.

**Nij:** What do you mean?

**Nate:** It’s all about the way the Earth spins. If you imagine our big blue planet as a giant ball in space. We think of this ball as having two parts. Top and bottom. With a line between them called ‘the equator’. The top half is called the Northern Hemisphere.

**Nij:** Yeah, and the bottom half is the Southern Hemisphere – that’s where Australia is.

**Nate:** Exactly. Now, the Earth doesn’t sit still in space…

**Nij:** It loops around the sun!

**Nate:** But it doesn’t do it perfectly straight. The Earth is tilted to the side a little. So, it means for half the year, the norther Hemisphere, the top half – is tipped toward the sun, so it gets more light and heat. So, the days are longer, and the weather is warmer.

**Nij:** It’s summer!

**Nate:** Exactly. When that happens, the bottom half of the world, the southern hemisphere, is tilted away from the sun, so we get less light and heat. That means shorter days and cool weather in winter.

**Nij:** And then for the other half of the year, it’s the opposite because the Earth is on the other side of the sun. So, we get shorter, colder winter days when the northern hemisphere has its turn for summer.

**Nate:** That’s it!

*[Gust of wind and paper flutters by]*

**Nij:** Here’s another question!

**Kid 2:** Why are there clouds in the sky?

**Kid 1:** Why there’s clouds in the sky?

**Nate:** I love clouds! They can look like so many different things.

**Nij:** Let’s take the roof off and do some cloud watching now!

**Nate:** You can take the roof off this lab?

**Nij:** Yeah, it’s the Imaginarium! We can imagine anything in here!

**Nate:** *(laughing)* Of course!

*[Nij presses some buttons, and roof opens up]*

**Nate:** What a view! Check out all that sky!

**Nij:** And all those clouds! We’ve learnt about clouds with you before. Can you remind us? How are clouds made?

**Nate:** Right, so if you take the air all around you right now, it’s clear, and colourless, right? You can’t see air but if you move and shake your hands around, you can feel it.

**Nij:** Oh yeah!

**Nate:** Well, this air might feel dry but it’s actually full of water! It’s so small you can’t see it with your eyes, and it doesn’t *feel* wet. But, if you were to take some of this invisible air from down here, and push it up high into the sky, the invisible water changes and it turns into teeny tiny drops of water

*[Sound of water drops]*

When you have lots and lots of drops of water grouped together in the sky, they form clouds. They look white but up close, they’re mostly just water.

**Nij:** Wow, but they look so light and fluffy, not wet at all.

**Nate:** They might look light and fluffy, but all that water means clouds are incredibly heavy. Even the littlest cloud would be heavier than an elephant, actually more like 100 elephants!

**Nij:** 100 elehpants?!That cloud even looks like an elephant!

*[Elephant trumpets]*

**Nij:** Oh, the sun’s gone behind it and it’s gotten all dark. That reminds me of another question that was sent in. Hang on a tick.

*[Sound of Nij tinkering around looking for something]*

**Nij:** Ah found it!

**Kid 2:** Hi, my names Jasper and I want to know, what happens to the sun when it’s not sunny?

**Nate:** The sun is always there – it’s sometimes just hiding from us. It could be behind some thick clouds like right now or hiding behind a big building. but the sun is still there. If you could get above all the tall buildings, higher than the clouds – like when you fly in an aeroplane – then it’s always sunny during the daytime.

**Nij:** What about at night-time?

**Nate:** Then the sun is shining on the other side of the world, so when it’s night-time here, the light is blocked by the ground under your feet!

**Nij:** That’s a cool way of thinking about it! I reckon we have time for one more question.

**Nate:** Only one more?

**Nij:** Alright, two

**Nate:** Let’s do it

**Kid 1:** Hi I’m Fynn and I’m 4 and I want to know why is the sky blue?

**Nij:** That’s a good one

**Kid 2:** Hello my name is James and I want to know why does the sky change colour?

**Nate:** Well, this might sound a little funny, but all those beautiful pinks, reds and oranges that fill the sky at sunrise and sunset are always there. In fact, sunlight is made up of all the colours of the rainbow! We just can’t see them. That’s because of something called *scattering*

**Nij:** And you know what – this is not only a weather thing, it’s a physics thing. And I’m a physicist! Do I get to answer this one?

**Nate:** Take it away, Dr Nij

**Nij:** You might already know that we breathe in oxygen and breathe out carbon dioxide. But there’s something else mixed in. It’s called nitrogen. Our bodies don’t use it, so when we breathe it in, we simply breathe it out again. Nitrogen makes up most of the air here on Earth. When the sun shines on the little bits of nitrogen, they scatter all the different colours of sunlight. But nitrogen is better at scattering blue light than orange-y pink light. So, that’s why the sky is blue in the daytime.

**Nate:** That’s right. At sunset or sunrise, the sun isn’t shining straight onto us from above, it’s coming in sideways, across the horizon. So, it’s at these times, we get to see sunlight that has had all the blue light scattered away – and what gets left behind are the lovely reds and oranges and pinks.

*[Thunder rumbles overhead]*

**Nij:** Uh oh, will you come back if we have more weather questions!

**Nate:** I’d love to! Now c’mon, let’s get out of the rain!

*[Rain pours and Nate splashes a puddle and laughs]*