

Hey everyone, welcome to this week's episode of Fish. Before we get going, we just want to let you know we have a very, very exciting guest across the pond.

An international sensation, someone that if you are a follower of great science and comedy over in America is going to be a household name to you.

It is the brilliant Hank Green. Hank is someone that we have been following for years and years. We watch his videos. He's very much a fish vibe and we've wanted him on for about nine years. And finally the moment happened and he managed to come on and it was so much fun to speak to him.

He himself has a podcast that I highly recommend you listen to if you haven't heard it yet called SciShow Tangents.

Very fishy as well. It's him and his two friends, Seri Riley and Sam Schultz.

And what they do is each week they try and just one up each other and amaze each other with weird, funny research and it's fun and facts.

So do give it a go and I'm actually going to be on it in a month or so.

I don't know the scheduling of it, but yeah, I'm going to be fighting facts with Hank Green and Seri and Sam.

So do give it a go. Check it out. Check out his books as well. His novels are absolutely amazing. And of course he does all the stuff with his brother John. You got to check that out as well if you haven't heard.

He's just one of those polymaths of nerd comedy. So give him a go.

We really hope you enjoy the show. One quick thing to mention if you're listening to us on a platform where you haven't followed us,

please can you press the follow button? It really helps us to bump up the charts.

Do that with SciShow Tangents as well. Give them a follow and otherwise enjoy Hank Green on no such thing as a fish.

Here we go. On with the show.

Hello and welcome to another episode of No Such Thing as a Fish,

a weekly podcast coming to you from four undisclosed locations around the world.

My name is Dan Schreiber. I am sitting here with James Harkin, Andrew Hunter Murray and Hank Green.

And once again, we have gathered around the microphones with our four favorite facts from the last seven days.

And in no particular order, here we go. Starting with fact number one, that is Hank.

My fact is the cacti-vic number system created by an UP at school children based on their languages system of counting makes math easier.

Brilliant.

How so?

I should say to start, it would make math much harder if you were you, unfortunately.

Was that specifically me, Hank?

Well, I'm just guessing that you use a base 10 number system.

And so converting constantly between base 10 and base 20 would be very difficult.

So Dan and the rest of us, we count in base 10.

So that means that if you've got a number, say, let's say 123, the number three at the end is three units.

The number two is two 10s and the number one is 100s, right?

Right.

And in base 20, we've got it.

So the third number again is the number of units, but then the second number would be the number of 20s in a number.

And the first number would be the number of 400s, which is 20 times 20.

So like, for instance, one, two, three in a base 20 would be one.

The three is the same.

And then two would be two times 20, which is 40.

And then the one would be one times 400, which is 400.

So one, two, three would actually equate to 443.

Is that right?

Yeah.

I really like about this counting system.

Is this right for a school project in 1994?

Yeah.

So they had a system of counting.

It would be basically one, two, three, four, five, and then five, one, five, two, five, three, five, four, five, et cetera.

And then once you got to 20, they would start over again with it.

So it's like the base 20 system with a sub-base of five.

So it's like two different bases in the counting system that the people there used.

But they created the number system as a class project.

The teacher was like, okay, like you have a counting system, but it doesn't have numbers.

So let's create the number system.

And it's the first number system created in the Western Hemisphere in like 100 years.

That's cool.

And every number is actually composed of strokes that represent that number.

So one is one stroke, two is a V, two strokes.

Three is like a backwards N, three.

And then four is like a W.

And then, oh my God, this is so cool and weird.

You strike on the top and that's five.

So five with nothing under it is five.

And then five with one stroke beneath it is six.

The five stroke with two strokes beneath it is seven, et cetera.

And then when you get to the next five, you do two strokes at the top.

That represents 10.

And then you add more strokes to the bottom until you get up to 20.

And then you start over at one and zero.

And that means that when you look at them, first of all,

it's representing exactly what the number is.

But that becomes very innate with anything like we know that four means four, even though four doesn't really look like four.

But you can actually just, if you want to subtract or add,
you just take the shape away that you're trying to subtract.
So if you've got a seven and you want to take away three,
you look and the three is in the seven and you take the three away.
That's very cool.

Wow.

Is it being used now?

Has it been adopted for anything?

Yeah.

So it's spread across a lot of native Alaska communities

because they had this counting system and having number systems for it was good.

But then, and so it's spread pretty, pretty quickly and pretty far.

And actually the math scores for those areas went up to above average for the U.S.

But then you started to get things like that,

the school funding based on performance on assessment tests.

And that was going to be based in a base 10 system.

It's going to be based with Arabic numerals.

And so the school stopped teaching it except in like specifically in UP at language classes.

And also like you can't type them into a calculator or a computer.

But then recently, like within the last few weeks,

it was announced that Unicode is actually going to be putting these numbers into its system.

So you will be able to use in UP at characters in computers

and build calculators that use them and function.

Very cool.

That's incredible.

Very cool.

Do they have any ownership over this kind of new system?

Like these kids?

Are they going to be the next Bezos and Musk?

Absolutely.

Coining it in.

This happened in the 90s when this like classroom sort of developed the number system
and then, you know, kind of got started spreading around.

And so now those school children are, I assume, my age,
because I was in high school in the 90s.

And I do not know like where the actual kids are who helped to develop.

That's amazing.

They're all in Silicon Valley.

It'd be weird to have like a royalty on a number system, but I'm for it.

I'm like, yes, please.

It was so good.

I find it amazing when you read about kids who notice something that,

I guess it's just that thing of, oh, it's a kid noticing over an adult
who works in this area.

There was, I haven't actually researched this.

It's just the memory of there's a kid, I think he was a teenage, late teens, who when he was being taught stuff from Newton's principia, he discovered a mistake.

No one had seen it.

Just he's correcting Newton, which is an astonishing thing to do.

And they all looked at him and were, oh, yeah, that's completely wrong.

Or I was reading about, have you heard about the Futurama theorem?

No.

So this is years ago, I went out for dinner in London with a few of the Simpsons riders, a guy called Al Jean and a few other people who they were in town because there's a great scientist here, mathematician called Simon Singh, who is a, he wrote a book because he noticed that there was lots of mathematics inside Simpsons episodes.

And it turns out all the head riders of the Simpsons are all math geeks.

They all went to Harvard and they all are like written papers and so on.

And so a lot of Simpsons episodes, there's hidden equations and, you know, formats, last theorem and stuff.

And I'm presuming you're not referring to the bit where Bart needs to escape a lion cage.

And he works out the Roman numeral for seven by adding Rocky five and Rocky two together.

Are you saying something even more complicated than that?

It's just a bit.

It's a very good gag, that one.

There is a, there was an episode of Futurama.

So it was the riders of the Simpsons who went over to that where they had to solve a problem, which was, it was an episode called The Prisoner of Bender.

And a guy called Ken Keeler needed to have a thing where he was talking about the idea of minds being swapped into other people and how could you get the mind back into someone if the mind could only travel once.

It was quite a complicated thing.

And he, he worked out by adding two extra people, no matter how many people were having their brains swapped, would mean that all the brains could return to the original person, all the memories could go back to the original person.

And that was a new development in mathematics.

It's called the Futurama theorem.

That's its own thing now.

Yeah.

So they had to create it to solve a plot problem within the cartoon.

That is really cool.

I have a, I have a thing I'd like to bring up about this because I saw people talking about it because this Unicode news is new.

And because this is like countable, like you can actually count the strokes.

People were saying, well, that's also true of Arabic numerals.

You just count the angles.

So with, with, you know, four, there's like, you know, dot, dot, dot, basically.

And with seven, there can be seven angles in a seven, right?

But if you put the stroke in the middle, then you can make it so that it counts up to seven.

And this has been a myth for a long time that it was created like that way intentionally.

This is a way that you can do like use Arabic numerals and you can like count angles and like basically make an eight in a certain way where it has eight angles.

But that's not a thing that like, I see people saying all the time that this is like an intentional thing.

And it was like, how Arabic numerals happened is not people were making weird squiggles and they were representative of something

at some point.

And then people forgot what they were representative of.

And just for like, yeah, that, that means it's called light letters, I guess the same, right?

Yeah.

It's just starting out with shapes.

Mandarin.

I speak a bit of Mandarin from my childhood.

And so the counting, when you write out the counting one to ten, one is a stroke of one, two is a stroke of two,

three strokes of it, and then they just give up.

They just, that it just.

What?

Yeah.

Six is something one, two, three, four.

Seven is two, two strokes, eight, two strokes.

Yeah.

They do so well.

But you've got to give up at some point with that system.

We have the opposite of that where most of our greater than 10 numbers have a system, you know, like 21, 35,

but 11 and 12 are just like, I don't know.

Yeah.

We're just going to be different.

We want to be crazy.

And then you can get to 13, 14, 15.

But I want to be 11.

I was reading about 11 and 12.

I was reading about it's kind of 12th.

It's all about if you take 10 away from those numbers.

So 12th comes from 12th, and that means two left.

Oh, it does.

If you take 10 away, you have two left.

Well, where the hectares of leaven come from then?

It's an even more tortured etymology, I think, but it's basically one left if you take 10 away.

But I can't remember why you're taking 10 away.

Yeah.

Yeah.

You know, Hank, I have a question for you because you seem to know a lot about this, right?

So the base 10, is it because we have 10 fingers?

We think that's why we counted base 10.

Yeah.

So the cactic number system, are we thinking that they counted with their toes as well?

I think that, yeah, I think that that is correct.

I think that's basically the case.

How interesting.

And there were also, I don't know if it was Babylonian, but one original number system is base 60, which we still have for degrees, and we have it for minutes.

It sticks around in weird places.

I wonder what they did, because there are some base 12 numbering systems.

There's not that many, but there's like, I think there's one in Nepal and some in Africa and stuff.

And I think the idea of that is you count between your fingers, right?

Yeah.

It's like the little dip in between each finger counts as one.

Yeah.

What I want to believe is that they recognized that it was better, because base 12 is better.

It's just better.

Is it?

Like, that's why we use base 12, because we have one in two dozen.

Like, that's a base 12 way of counting, kind of.

And because it's more divisible by more things.

And that's why we keep using dozens, is because you can divide it up more easily and make different better shapes out of it when you're shipping stuff around.

That's interesting.

Okay.

In ancient Japan, Dan, you were talking about how...

It was in China.

In Chinese, you had the lines.

In Mandarin, yeah.

In Mandarin, yeah.

So, in ancient Japan, they used to actually use sticks to count with.

And in the same way, we might use a calculator or whatever.

You would use actual sticks.

So, you would do one, two, three, four, and then you would take them away or add them or whatever.

And then they came up with the zero, because zero isn't a natural thing.

Most number systems don't have a zero to start off with.

They work out that they need it in order to do like tens, hundreds, and thousands and stuff like that.

And so, they started using a go stone.
So, a stone from the game go as a zero.
And then as soon as they worked out that they could have a zero, they started being able to use abacuses, which had come over from China.
And they stopped using these sticks almost overnight.
And you can see all this writing of these teenagers who say, our parents are using these sticks to do all this counting.
We can't work out how it works.
We have no idea what's going on.
We use abacuses, because obviously that's the best way of doing it.
We have no idea what they're doing.
Yeah, it's like new math.
Like Common Core comes out in the U.S.
And suddenly the parents are like, what are these kids with their beads?
Yeah.
What are they doing?
They're filling up a whole piece of paper to divide 12 by 2.
So confused.
You know how if you count to a million, and you count a number of seconds it takes about 11 days, and if you count to a billion it takes 30 years.
There is someone who's counted to a million.
I think you might be the first person ever to count to a million.
He's an Alabama man called Jeremy Harper.
So Hank, one of your countrymen.
Counted to a million.
It took him 89 days, but he managed to.
Wow.
That seems doable.
It's doable.
And I guess you just like, you sort of write it down when you go to sleep and then you wake up and you're like, let's start up again.
He did write it down.
But if you're going to take sleep breaks, you might as well take other breaks.
You might as well like, I could count to a million over 30 years.
Would that count?
Also, once you've got to a million, do you feel bad stopping?
Yeah.
Yeah.
You've got to carry on at that point.
You've got to carry on.
Jeremy wake up in the morning and he's like, well, a million in one, a million in two, a million in three, a million in eight.
And also, like, was he doing it out?
Like, was he actually saying the words or was he doing it in his head?

Oh, yeah.

No, he was, oh, James, he was definitely, anyone could say they counted to a million in their head.

But he was streaming, he was live streaming the entire process.

Poor wife sitting at home going, fuck, I have to listen to this all of it.

I remember there was a period in the early 2000s, around 2000 and like, no, it's not quite early, but like 2007, where counting to a million became a thing.

I had two friends who were racing each other to count to a million.

And that was really annoying.

We'd be at the pub and they're just counting out loud and one's like a thousand ahead.

And I'm trying to have a chat.

And I can't even remember where they got up to.

I think we just all stopped being friends.

It really got in the way.

That sounds like the right decision.

Dan, if he made a mistake, did he have to go back to the start?

Because I think under the pressure of just counting, I reckon I'd make mistakes.

Yeah.

I reckon I'd go from 111 to 119 by accident.

Yeah, yeah.

Oh, yeah.

Well, you would have loved the pub chat there, James.

I mean, I can't count \$100 without starting over.

Okay, it is time for fact number two, and that is Andy.

My fact is some people can control their own goose bumps.

That kind of gave me goose bumps.

Maybe like I got some tingles in the back of my head.

Well, there's a one in 1500 chance you are one of the chosen ones.

I'm not.

It's called VGP voluntarily generated pillow erection, and the pillow erection is the term for getting goose bumps.

It's got to be a better term.

Oh, sniggering in the back.

I imagine what is the, what's the prefix Pico mean, Hank?

That means very small, right?

Little, tiny.

Yeah.

So you don't want to get your Pico erection mixed with your pillow erection.

Yeah, so this, so normally you get goose bumps when you're cold or you're watching an exciting movie or you're having a big emotion.

You know, there are a few different things.

Yeah, I've seen this episode of Taskmaster.

Yeah.

And obviously it's, well, not obviously really, but what happens is

your body is trying to raise your hairs on end.
The hairs, the sort of remains of the hairs that were once thick
and all over our bodies to create a fluffy layer all over you.
Yeah, Andy, sorry, just still thick on Dan's case.
That's what I'm thinking.
I've not progressed from the ancient man.
You actually do get warmer.
Do you get slightly warmer if you get goosebumps?
He gets much bigger.
I get wider.
Yeah, I inflate.
No, that's, I mean, the wording of that, I read that as well, does make it sound
as if a predator's coming, you get scared, you go like a dried dog.
And yeah, I don't see that being an intimidating size difference to a human.
No, but it makes a big difference.
I mean, it's a bigger difference when it's a tiny bird, for example, fluffing up its feathers.
You know, that is more impressive.
It makes a difference in a cat as well.
Like when my cat's been fighting outside one of the other cats, she comes back
and she's really fluffy.
She's probably big.
Yeah.
Does your cat fight, James?
Sorry.
Oh, she's a northern cat.
Yeah, yeah.
Northern cat.
I don't, James, I don't mean to cast dispersions, but she looks like the most pampered house cat.
I didn't, I can't believe she goes outside.
Yeah, well, you should hear what she says about you.
I won't come around if I were you.
Wow.
Oh, we're learning.
So anyway, sorry, there are these.
So you've got the follicles all over you and they have that every follicle has a little
nerve in it, which is connected to a tiny muscle which can contract and hold the hair up on
end.
So that normally happens if you're cold and you can give yourself goosebumps if you think
of, you know, a big emotional occasion or thinking of fingernails down a blackboard,
that's slightly different to what the 1 in 1,500 people with VGP can do.
They don't think about something else to give themselves goosebumps.
They just, they just get it.
How do you know, though, are they in an MRI machine when they do it?
Because maybe they're just good at thinking about blackboards.

Yeah, this seems to be going on trust, doesn't it?

Yeah.

The article that you sent round, Andy, there's the person who's the case study that they're talking to called Travis Carrasco and he just sits back and forth like moving his head back and forth and like, and his parents will be like, what are you doing?

And he's saying, I'm giving myself goosebumps.

And so that's, that's how he does it.

But what's really interesting, he's a mechanical engineer.

Oh, he's not a child.

No, he's 29.

He's 29, a mechanical engineer from Las Vegas.

And the article starts by saying he's a normal individual.

He loves coloring with colored pencils, likes leadership books, and the color green.

That's, that's his description.

That's not normal.

That's bad profile writing.

Could you now find something more normal about this man?

Yeah.

Is there anything else you can give me?

Anything else?

No, it's just colored, colored pencils as my thing.

Leadership books.

It's not much of a superhero thing, is it, Dan, really?

Like, you know, if you turn up at the X-Man Academy and say that this is what I can do.

Well, it kind of is.

Yeah, yeah, yeah.

It's supposed to be autonomic.

Like, it's like being able to decide that your heart breathes, or breathes, heart beats faster.

If you decide to make your heart breathe, that is a problem.

Yeah, I saw recently a study from the University of Padua, and they found that the neurons which fire in your brain when you get goosebumps.

So it's not a deliberate thing, but there are neurons firing.

The ones that fire are the same ones as make your nipples erect?

Yeah, that makes sense.

So that's interesting, isn't it?

It's like the biggest of the goosebumps.

Yeah.

I wonder if these one in 1500 people can also make their nipples erect at will.

Wow.

That would be a better skill.

What a skill.

Good question.

Travis!

I have a question about your nipples!

Put down those coloring pencils.

I think it was Travis.

It might have been another person talking about it.

But so when they're getting the rocking feeling, he said the goosebumps will start on the back of his head, the back of his neck, so sorry, the bottom of his head, the bottom of his neck, and his bottom.

So yeah, I don't really think about goosebumps on my butt.

Exactly.

I've never thought about goosebumps.

But apparently that's where he can get it, and then it kind of just envelopes his whole body.

Envelopes, you mean?

No, no, envelopes.

Do geese have goosebumps?

No, they don't.

They don't get them, I believe, because they've got feathers.

I don't think they have the muscles connected to the, if you pluck a dead goose, or a live goose, then it'll have a kind of puckered, but actually, they should be called chimpanzee bumps, or cat bumps, or something.

Or human bumps.

I mean bumps.

Yeah.

Just call them bumps.

Skin bumps.

Yeah.

Well, they should be called pilo erections, clearly.

Oh, yeah.

Yeah.

The OED says that goose bumps is an American word, and British people have either goose flesh, hen flesh, or goose skin.

Oh, because I thought the American was goose pimples.

Yeah, we thought you said that, too.

I thought goose flesh is quite an old-fashioned, you get that in an old novel, maybe.

Yeah, I definitely see why you guys are slowly switching over to ours, because goose flesh is gross.

Another one you can have is ancerine skin, which I really like, and ancerine means like a goose.

That's...

Like bovine is like a cow, ancerine is like a goose.

Very nice.

It's good to have that word, just in case.

Darwin was really interested in goose bumps.

Darwin wanted to see, particularly on animals, what it was, like what was this thing that was happening to them.

And so he used to go to zoos, and he used to investigate goose bumps by bringing a stuffed snake with him, and just chucking it at animals, and giving them this sensation of fear.

And then he would just note down,

This is a man who really doesn't want to finish his book.

Yeah, no, he loved pylorrection.

He was very into it, and he would constantly be looking at it, and he could see it in dogs and baboons and parrots.

I mean, it's great.

I wish...

There needs to be more talk about Darwin's sort of like, you know, how he used to play, what was it, bassoon to his plants and stuff like that.

There was a team of scientists in Korea, and in 2015 they developed, I think, which was a goose bump detector.

So, this is very cool.

It's this tiny patch that you can stick on your skin, and it was developed by a professor Young Ho Cho, and he was watching a reality TV show, a music survival reality show, and he wondered if you could calculate people's emotional response.

So, when people say, I'm getting chills listening to this, you can assess the truthfulness of that statement.

Are they really multiplying?

That is the question.

Yeah.

Are you really losing control?

Got a shave on?

Yeah.

There's a guy called Thatcher Keltner at the University of California, and he uses this system to measure people's goose bumps, and he calls himself an awe scientist, so he checks out when things are awesome and Californian.

That's good.

They found that if you make someone look at like a Tyrannosaurus Rex skeleton or a huge tree or, you know, something really amazing, then you sign your name smaller, and the reason being that you kind of think of how amazing the world is and how small you are in proportion to it.

No.

Isn't that amazing?

Oh, man.

Yeah.

I've never noticed that.

I'm going to write my name next time near a big tree.

That is a very Californian thing.

Which bit of America are you in, Hank?

Montana.

Oh, okay.

It's like California, but not culturally.

Okay.

Got it.

I just, it feels like, you know, in California, that's the way you get grants.

You say, well, I'm studying how rad things are, how sweet these waves are.

My favorite Goosebumps of all, of course, are the ones in print by R.L.

Stein.

Oh, of course.

Oh, wonderful series of books.

Something really interesting is that I was watching an interview with him last night.

Just went down a little R.L.

Stein rabbit hole.

What a career that guy had.

He started writing the Goosebumps books when he was in his 40s.

He was like 46, I think, when he started.

Prior to that, he wrote like computer joke books.

He did novelizations of, you know the movie Spaceballs, Mel Brooks' movie?

Yeah.

So he had this whole, I think the novel is better than the film in that case, isn't it?

Everyone reads the novelizations of comedy films.

There are actually some people who can consciously give themselves spaceballs.

So he was saying just within his, within the Goosebumps books, he says, they're not really scary.

I could have made them really scary, but I keep real life out.

That's what's really scary.

So he says, there's no divorce.

No divorced parents in Goosebumps.

There's no child abuse.

There's no real world life.

It's fantasy.

The scare is a kind of subtle.

They are scary.

Well, I've read more than my fair share of Goosebumps when I was a small boy and they were terrifying.

Yeah.

But you didn't read that one where the whole story is just two parents going through a messy divorce.

Did you?

That's real scariness.

I think it turns out he was wrong.

He has put it in and not realized it, but that, that was his ambition.

Okay.

You said that he wrote them.

He started writing them in his forties.

I think he kind of almost finished writing them in his forties, right?

Because he wrote 62 books in five years.

It's insane.

He was pumping out one a month, I think.

Oh my God.

He said that he could write them in six days, one of these books.

It's incredible.

That's the good life.

The opposite of Darwin.

Can I tell you, can I tell you one more thing about skin?

Oh yeah.

Yes, please.

Skin in general.

Yeah.

This is really interesting.

Growing skin is really difficult because it's, well actually growing skin flat is easy, but then if you're grafting skin that you have artificially made, it's very hard to stitch it around the body part, you know, because we're not flat.

So this year, this is very exciting.

Scientists at Columbia University, they've worked out how to grow skin in very complicated shapes.

So one of the first things they did, they've made a human glove, a hand made of skin, if you like.

I know.

And you can just swap it on.

Andi, can I just ask?

Sorry.

Yeah.

Because I can see your hands now, but I can't tell whether or not you're wearing one of these skin gloves.

I'm wearing a whole skin me, actually.

I'm in a full body suit of my skin.

Sounds comfy.

Yeah, but it's genuinely very exciting.

They scan the hand, let's say I need a full hand, I say I've burned all the skin on my hand, you know, they just, they can scan your hand, they make a model of it, they grow the skin on a cut, that scaffold, then they remove it from the mold and they can just put it on for the surgery.

And I just love this so much.

They tested this, they haven't done a human trial yet.

They tested this by grafting skin onto mice.

With human hands on a mouse?

Yeah, just a giant human hand sticking out of the mouth.

No, it's better.

It's better than that.

They put, I think, a pair of human skin shorts on the back end of the mice.
What?
They...
Yeah.
Oh, wow.
Would a mouse wear human skin pants like this or like this?
Okay, it is time for fact number three, and that is my fact.
My fact this week is that early ideas for communicating with extraterrestrials included digging massive holes in the Saharan Desert, filling them with oil and lighting them every night so that passing aliens could see it.
Also building a mirror so large it could send a beam of light to Mars to burn written messages into the ground for the Martians to read.
For the Martians to read and not like feel as if they are being lasered from space.
Yeah, imagine if like a huge laser came down from space and just burnt a massive hole in the earth and then everyone's screaming and someone goes, oh, wait a minute, it says hi.
Yeah, it's one of the smiley faces.
And just by chance the Martians speak and read English.
It's great.
Yeah, there wasn't great thinking behind it.
This is a fact, by the way, that I found in probably my favorite pop science book that I've read in a very long time.
It's called Is Anyone Out There?
And it's by the late great, he only died last year.
It's so upsetting.
Frank Drake, who people might know from Drake's equation, he was very much a part of the greatest push for searching for ET.
He's the founder of SETI along with Carl Sagan and numerous other scientists and a lot of people for a very long time up until quite recent thought that there probably was Martian cities and that there were Martians living there and we couldn't quite see them.
So plans have been as big as building a mirror that can beam a laser down to burn into the ground all the way through to sort of almost crowd-funder things to raise money to cover the entire Eiffel Tower in mirrors so that every night at sunset, as the light was beaming off it, it could be bounced in direction of Mars.
Just to let them know, we know you're there and we're just trying to say hi.
Wow.
Just rather than putting words, a lot of them thought we would put like, you know, a right angle triangle or, you know, something that people would recognize.
Some math thing.
Yeah.
Prime numbers.
Something that the aliens would go, ah, these guys like maths.
That's...

Yeah.

Well, that's right.

The one, particularly the Saharan Desert one, the idea, it was a guy called Johann von Littrow who wanted the shapes of what they were digging to be a triangle and a square and a circle.

It looked like a giant PlayStation symbols on the game, sort of as you were passing Earth. It was all of these shapes.

There was another person who thought, what if we did Pythagoras' theorem?

Because that would then display that we know advanced math, that we understand that and they know there's an intelligent civilization down here.

Yeah.

That was Gauss, wasn't it?

Who thought that?

Yeah.

Who, you know?

Who's that?

Gauss is one of the best mathematicians in history.

Oh, okay.

I thought there were about 300 different ways of proving Pythagoras' theorem, though.

And so, if you put one up, you don't know that the aliens will know that particular one.

I don't think we were necessarily going to put the proof up so much as an example of it.

Oh, okay.

You know, it's always seemed to me a little bit much that here on Earth, some people just sort of can unilaterally decide, like, hey, I want to send a message to that star and then they do that.

Or I don't know that it was a ton of people who decided to put, like, a golden record on Voyager to be like, here's what we are and where we are and what we look like.

It seemed like it was a pretty small, small group, kind of unilaterally making that call.

Yeah.

Because it might prompt a terrible, it might prompt a very bad reaction from whoever receives it.

I mean, in the case of Voyager, it seems pretty symbolic.

I don't know.

They find it and think these people are peace-loving.

They're chumps.

They will absolutely roll over as soon as we invade.

Yeah.

And I called Joe Davis, who in 1986 sent the first art piece into space and he did that pretty unilaterally.

Well, he had a little bit of help because his piece was called Poetica Vaginal and he recorded the vaginal contractions of Boston Ballet ballerinas and then sent that recording, that radio recording into space.

Okay.

Can we hear it now?

What is it?

I don't have any ballerinas with me, I'm afraid.

Trying to think of what it sounds like.

Okay.

Again, it's a very sort of peace-loving artistic message to send.

I do think we should invest in sending threats into space.

I think if someone sent me through the post a CD and I put it into my CD player and it was the vaginal contractions of ballet dancers, I would find that quite threatening.

Yeah.

I don't think I would find it as threatening as a space laser, but I hear what you're saying.

Yeah.

But it's a warning.

The other thing is they sent music into space, like recordings and music, right?

The first one that they did was a load of Russian teenagers who sent a theremin concert.

You know these theremins is like a big stick and the more you put your hand next to it, it goes woo!

And then there was no more music sent into space deliberately towards a star for seven years at which time NASA sent across the universe by the Beatles.

And I just wonder if aliens just got those two messages, they must have thought we had a hell of a good run after the theremin music to the Beatles.

Yeah.

Wow, they really cracked music with their second song.

Yeah, it's very exciting the way that there's so many different hypotheses about why we haven't made communication with any aliens.

There's a guy called David Brinn, who's a fiction writer, but he also has this great collection of all the different theories and his his thinking behind why that might be or might not be possible.

There's a really nice one that I love, which is the Waterworld Hypothesis.

And the theory goes that the aliens have seen that movie and thought we're not going there.

Yeah, they just they just talk about, yeah, really went over budget apparently issues with the script.

The Waterworld Hypothesis is that the idea that there is plenty of life out there, but much like dolphins who are seen as sort of the other great intelligent life on our planet, they're also stuck underwater and they can't get above it because we're living in.

What do you mean they're stuck underwater?

Well, we're living in a we're living on a planet which is very much in this idea of a Goldilocks belt, right, where we've got a lot of landmass and we've got a lot of oxygen to breathe and so on.

We're we're in a beauty spot and it's very rare to be in that beauty spot.

So the thought is that there is life, but it's underwater.

What do you mean?

It's a surface.

Just come up to the surface.

Have you not seen the little mermaid?

It's dangerous up.

Well, it does.

It definitely creates a huge problem for space travel.

So like if you're if you need wet to walk around in, then you got to carry that wet up with you to space.

Yeah, that's much, much heavier than carrying a bunch of air up with you sloshing around.

But John Lilly, who we've talked about on the podcast before, who you dad, you have talked about on the podcast before.

Yeah.

Yeah, I read a whole chapter of it in my book.

I love the guy.

He he tried to create cars that would be driven on the road, which were filled with water that you would.

So you'd be on the road, you turn to your left and there'd be a dolphin sort of swimming away in his car.

Yeah, he was a genius, guys.

Dan, you mentioned SETI earlier on and they're looking for, I think, radio waves.

They are, yeah.

But they've like they're they're checking various different parts of the universe at different times.

But I read one comparison that so far, the whole of SETI, since they started, has checked so little of the universe that it's the equivalent of checking one hot tub worth of water compared with all the amount of water in all the Earth's oceans.

It's a big place, James.

Famously.

Yeah.

Famously large.

But no, that's incredible.

It's like getting one hot tub of water and going, oh, there's no fish in here, so there's no fish at all.

Yeah.

Yeah.

But you're more likely to find the wristwatch you dropped in your hot tub than in all the oceans in the world.

Yeah, that's true.

So, you know.

Well, I'm glad that we didn't do the burning lots of oil in the desert thing because one of them would be maybe destroying Mars, but the other one would be definitely destroying Earth.

Yeah.

They like us better.

And it would be no use because I think someone worked out that if Neil and Buzz were standing

on the moon looking back at Earth from Apollo 11 missions, they just would have no view of it whatsoever.

Like, it's just not practical.

The Earth is so tiny even from that distance that you wouldn't be able to make that out.

Those stupid people.

I read them, in fact, I worked this out a while ago, if you wanted to write the word high on the moon in such a way that you would be able to see it from Earth, even, well, just as in you would look on the moon and in one of the eyes of the man on the moon, you'd be able to see the word high, then the cross of the H would have to be the distance of about, I think it was something like Cardiff to Edinburgh, something like that.

Right.

Just that one H.

Yeah, yeah, yeah.

Exactly.

The moon is bigger than I thought it would be.

The moon's quite big, yeah.

Yeah.

You always think of the moon as being tiny, you know, get around it in half an hour.

That is very big.

Do I?

I imagine you see Buzz Aldrin and Neil Armstrong after they get back.

Buzz, you saw the whole thing, man.

What do you mean you stayed near the ship?

God, you're such tourists.

OK, it is time for our final fact of the show, and that is James.

OK, my fact this week is that Joey Helpich and Kristen Muir have made more than \$10,000 from their song Poopy Stupid Butt.

Sounds like a banger.

The record label will be happy to have it.

Yeah, I mean, you could make more from a song called Poopy Stupid Butt.

I think what it is is that they accidentally made \$10,000 without recognizing it.

That's awesome.

In that case.

That's a good way of wordin' it, yeah.

The reason being they've made that money because children shout the words Poopy Stupid Butt or play Poopy Stupid Butt into Alexa and Alexa just plays it.

And the reason they know this, I read this in an article on BuzzFeed by Katie Natopoulos and she spoke to a lot of these people who do these kind of things and they realized that when they look at all the revenue for all their songs, it's all coming from Amazon Music and most musicians would get most of their money from Apple or from Spotify or whatever, but these people who are getting it mostly from Amazon Music because it's attached to Alexa, they're pretty certain that the reason they're getting it is because people are shouting things into their Alexa.

And now there are people who deliberately make songs.

Well, I mean, shouting, maybe they're politely saying it.
Maybe they're just children politely asking to hear Poopy Stupid Butt.
It could be polite, yeah, in fairness.
I'm giving the children a bad name there, but yeah, there are people now who go out there and deliberately make songs that children will say to Alexa just so they can make more money.
Okay, what about things that grown-ups will say?
So for example, where are my keys?
Like if you're going because I'll have you seen, you know, do you know what time they're coming around?
You know, that kind of stuff.
Can I just ask, Andy, how often do you ask Alexa where your keys are?
I don't have an Alexa.
At a certain point, you're panicking, right?
You'll ask anybody.
There is a guy that Katie, who wrote this article, interviewed, it's someone she knows called Matt Farley and exactly what you're saying, Andy, he composes songs, he's composed more than 23,000 songs.
They're really short, but he uses phrases that might be asked by Alexa, therefore generating him an income.
So he'll use any kind of phrase or he'll use a celebrity's name inside a song so that accidentally the song will be played.
His biggest hit, by the way, is a song called Poop Poop Poop Poop Song.
That's been streamed eight million times on Amazon Music.
He makes, that's where he makes his money, but he makes the point that he didn't get into this to sort of hack the system.
He was doing this back in the day, back in 2013.
He was like, I lucked out because smart devices weren't even a thing when I wrote Poop in my fingernails, but it turns out I was biding my time unaware.
He was selling it on a cassette, wasn't he, you know, in a nightclub saying, well, you listen to my new tape.
The Joey Helpisch and Kristen Muir won this song, which is called Poopy Stupid Butt.
They ran a music school in Oregon and they worked with autistic kids and they were kind of just trying to come up with songs and it was just a part of the playtime almost.
And they asked this four-year-old to, it's weird, they asked a four-year-old for a five syllables, which I don't know, four-year-olds know what syllables are, but they asked them for four syllables and this girl shouted out Poopy Stupid Butt and they decided to write a song with the subject, it's almost like an improv game.
And he said, all the kids, because they have a bunch of songs, all the kids have sort of co-written the songs and I don't want to cause shit here, but I don't know if these kids are getting their royalties.
I don't think they've seen it.
Yeah, this is a good point.
You know, we were talking royalties at the beginning with the counting system, you know,

that is harder to get, but should these kids be reimbursed?

These are definitely co-writers, like there's no way that that's not a co-writer.

So we are, we thought we were going to have a fun time here, but now it's time for legal action.

I was looking up novelty songs in general.

I think country music is very good at kind of, not novelty songs exactly, but like country music songs have incredible titles and I just made a list of my favorite ones.

There's Dropkick Me Jesus through the goalposts of life.

Yeah.

Okay.

Yeah, that's America.

That's country.

That's not even novelty.

That's just down the line country.

Somebody named Travis wrote that song for sure.

Get your tongue out of my mouth cause I'm kissing you goodbye.

Love it.

Beautiful.

And final, I wouldn't take her to a dog fight cause I'm afraid she'd win.

Okay.

Hell yes.

Yeah.

You know.

Bit sexist that one.

Just a bit.

She's just great.

She's a strong one.

Big teeth.

That's all.

I haven't listened to the song.

It's entirely possible.

That's the message of it.

And I'd like to think it is.

Yeah.

Who do you think what you would say is the greatest novelty songwriter alive?

Alive.

Alive.

Tom Lehrer.

Tom Lehrer.

Yeah.

Tom Lehrer.

Okay.

Maybe parody is where I'm sitting.

He's, I think of him as a satirist.

Yeah.

Like Bo Burnham.

Maybe.

But he is the greatest.

I'm thinking Weird Al Yankovic.

Oh, Weird Al Yankovic.

Yeah.

He's got an entire career of doing these novelty parodies and he's had number one albums.

Well, he's had certainly one number one album, which was his last album in 2014 or 13.

And what's interesting is he suffers hugely from people misattributing other people's parodies to being him.

So if you go on, if you go on torrent sites to download songs, there will be so many songs that are under his name.

And it's a huge problem for him because a lot of these songs have terrible attitudes about them.

You know, they're racist.

They're sexist.

They're, they're promoting things that he doesn't agree with.

And so fans have sort of backed him and tried to separate the non real songs from the real ones.

There's a, there's a website called the not Al page where you can look at all the songs that are supposedly his songs and then telling you who the real person is.

So he really hates it because he says he puts a lot of work into his songs.

He did one song about a duck.

He spent a week in a library researching ducks in order to get, you know, the right kind of RL Steiner could have written an entire goosebumps novel in the time it took him researching ducks.

But there's one thing he's really going to hate, which has been developed in his name, which is there's now weird Al Yankovich AI, which can generate parody lyrics that then be attached to existing songs, which then you can sing as, as karaoke.

So he is now effectively an AI.

It's going to happen to us all.

Yeah.

That's how it works.

Will that happen to us all?

Yeah, it will, except that all of ours will be way less good and interesting and fun than that.

Yeah.

Because actually, you know, computers could already count to a million, but that guy still did it and still got popular for counting to a million.

Right?

Jeremy.

Did he get popular?

I mean, we mentioned him on a partner.

So there's that.

Jeremy Harper.

He's still out, he's still out there.

He's probably on five million by now.

Yeah.

I think it must be so hard to count to a million because once you're in like 364,990 in 27, I've already forgotten the start of what I just said, you know?

300 something.

Yeah.

Well, exactly.

Yeah.

It's tough.

Maybe you just get into a groove.

Alexa, count to a million.

That would be a good way of like keeping Alexa busy, you know?

That's neat.

Stop listening to me.

Just count.

This, this isn't for you to hear.

I don't want to be listened to.

I don't want to be spied on in my home.

No, thank you.

Go to your room and count to a million.

The process of training Alexa was very strange because they needed a load of human voice samples to train people on, right?

And so I think Amazon hired a load of flats and houses in Boston and Seattle and they got people in to read scripts of the sort of things maybe that you might ask an Alexa and the scripts were bizarre.

I wonder if it was those same Boston ballerinas as did the other thing.

Definitely.

Definitely.

You need to get an appointment now if you're vagina sounding like that.

No, well, the problem was that obviously the houses and flats that Amazon had hired, they had this string of strangers turning up at a random house all of a sudden.

And so on, I think more than one occasion, the police were caught because they thought it was either drug dealing going on or there was, you know, that suddenly like it was suddenly become a brothel and the police showed up and they just saw these actors and some rather sheepish Amazon stuff.

So there's nothing going on here, nothing to see here.

That's amazing.

They keep it secret who Alexa is, but a journalist did find out.

It's a lady called Nina Roll.

She lives in Boulder, Colorado.

And she's basically signed effectively like an NDA.

She got called up.

She said, I can't say anything.

They make sure that she doesn't say anything in return, but you can hear other ads that she has done where you can identify the voice.

So she's on her website.

You can hear her doing an ad for Mott's apple juice or a Volkswagen ad.

And you know, it's definitely her.

But the original, original Alexa voice was for a system that was called Ivona and that was a Polish thing.

And it was a sort of voice synthesizer and that originally had a male actor who was the voice behind it called Yasek Labyak and he had a horrible time because when it was being used in Poland, the voice synthesizer was being used for everything.

So he'd pick up his phone and he'd be receiving calls from an automated voice, which was him urging him to vote for a candidate in an upcoming election and then people would say really racist random things using his voice and putting it up online.

So he suddenly was hounded by his own voice wherever he went, but it just ruined him.

This happened with TikTok as well.

TikTok had like a thing where you could type in some text and then it would have a person's voice say it and it was tapping into an actor's voice thing that had been created, but the actor had not given permission for it to be used in this use case and it was used to say many terrible things that the actor could hear herself saying and she sued TikTok about it and you can no longer get that voice.

Then they launched a bunch of other voices and they actually did like a partnership with Disney so that you can like have the voice of like the Mandalorian say things or Yoda or I think Chewbacca also was an option, but it just made Chewbacca noises.

Hank, are you worried then because there's so much of you out there on the internet.

Are you worried Tom is going to make a replacement you?

Yeah, I was just thinking about this like how far in the future is it before like I could be dead but also still making YouTube videos?

Like already authors die and then they keep making books somehow because like you know what the vibe is, you know, the kinds of books and even before they're dying they're working with co-authors and they just keep making books after they're dead.

Yeah, Tom Clancy, Virginia Andrews.

There's so many examples.

But like at what point am I just going to keep tweeting after I die?

Like how hard would that be?

They're not that good.

Well there was someone recently on Twitter who said that people should be collecting lots of audio of their loved ones so that in 10 years time we'll be able to have virtual loved ones where it'll be their voice saying things that they might say to you which...

Yeah.

And Shatner, he did a whole thing where he's recorded himself saying so many things and there's a virtual hologram of Shatner now that can basically interact with the kind of chat GPT response.

But it's Shatner.

And the plan is that you're, for example, your grandmother, let's say your grandmother's passed away, she can still read your children a bedtime story or DJ for you if you like.

Did they?

You know.

Granny's DJ.

Dan, do they call it Shat GBT?

Oh.

Oh, they should do.

I'm worried that they're going to create an AI me, but based on like 2007 me because

I kind of hate that guy.

What's wrong with him?

He sounds alright.

I don't know.

He's just got a lot of energy I don't have anymore.

What's PQ?

What's PQ Hank to just so we know?

Just within the last few years, please.

Oh, you always think that though.

I'm sure that in the future I will also consider my current self cringe.

Yeah.

No, it is weird thinking about yourself a few years ago.

They have things where you can like send yourself an email in the future, can't you?

Yes.

Stuff like that.

Maybe you can do that where it will be your own voice and your own face and everything in the future.

Just send yourself a message saying, I'm not a jerk, honestly.

I'm cool.

Oh.

Block and delete.

Block and delete that guy.

No, he's emailing me all the time.

I don't want to hear from him.

He's a wanker.

Oh, 2006 Andy, mortifying 19 year olds.

Could you imagine that like you from 2006 parenting your current child?

No.

I think my 2006 me would have a lot more energy than 2023 me.

Yeah, I think that is correct.

He could certainly drink more.

Okay, that's it.

That is all of our facts.

Thank you so much for listening.

If you'd like to get in contact with any of us about the things that we have said over the course of this podcast, we can be found on our Twitter accounts.

I'm on at Shriverland, James at James Harkin, Andy at Andrew Hunter and Hank.

I'm at Hank Green.

Yeah, that's right.

Or you can go to our group account, which is at no such thing or our website.

No such thing as a fish.com.

All of our previous episodes are there.

Do check them out.

Hank, what else should people check out with yours?

Yeah, I'm at SciShow Tangents.

It's a comedy science podcast game show trivia thing.

It's fun.

And it features current Hank, the best Hank available.

Do check it out now.

We'll be back again next week with another episode.

We'll see you then.

Goodbye.

Bye.

It's been very funny, you guys.

You guys are so funny.

Oh, thanks.

That's okay.

I'm getting a pico erection.

Are you sure it wasn't a pico erection?

Yeah.

Are you sure it wasn't a pico erection?

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.

Yeah.