



# The Climate Connection

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# Episode 5: Greenhouse classes

## Transcript

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# Episode five: Greenhouse classes

You can find the show notes and link to the podcast at <https://www.teachingenglish.org.uk/professional-development/podcast>.

**Duration: 48:58**

**Quote:** We've made a big mistake to take learning away from the planet, and put it in its own special box, you know. Learning's escaped that's what's happened, it's sneaked out under the door and the kids have gone with it. There's nothing like being *in* the planet to be *aware* of the planet.

**Quote:** A positive thing that has come out of this global crisis is that there's so much more collaboration between students and teachers around the world.

**Quote:** We ran a project called BYOB (bring your own plant) unbelievable results, we were getting, you know, ADHD cut by three quarters. Turns out it wasn't the kid that had the attention deficit, it was the environment was deficiating their attention, you know.

**Sting:** The British Council presents the Climate Connection. Climate action in language education. This is Episode Five: Greenhouse Classes.

**Chris Sowton:** Hello and welcome to the Climate Connection, a British Council podcast focussing on climate action in Language Education. I'm your host, Chris Sowton. This is Episode Five: Greenhouse Classes in which we look at how teachers can create classroom environments which are positive, inclusive, and ecologically friendly.

In this episode, unlike our first four episodes, we'll be talking in detail to just one guest: Professor Stephen Heppell. Stephen is a globally recognised expert in online education and learning spaces. His work on hundreds of projects with governments, international agencies, businesses, schools and communities has seen him established as an international leader in the fields of learning, new media and technology.

In our podcast series so far, Stephen, we've talked a lot about the environment more generally in a wider scale, but I wondered if you could share some of your ideas and your thoughts on the classroom environment and why that's so important for learning in general, but also how it can specifically help language learning in particular?

**Stephen Heppell:** I think a lot of folk know me, I've been a professor for over 30 years. Officially old! And, you know, with the Internet of Things, with big data, with cloud-based information, and we started looking seriously at the actual learning space itself. We thought we'd be clever and build some little boxes that captured as much information as we could find because I think every teacher listening does, every student for sure will tell you that the classroom's a bit hot, it's soporific, you know. And if the CO<sub>2</sub> levels are a bit over the top, you know, they'd probably say it feels a bit muggy, you know, they find it really hard to concentrate. So we started with a really big literature survey of what we do we know about the brain anyway and it dawned on us that the parallel really was with English sport where I think at the Atlanta Olympic games we won one gold medal. Pinsent and Redgrave, back in



those days we were the top nation at sitting down sports in any sport venue, you know so cycling, rowing, sailing, horse riding and Formula One, we were top nation but as soon as we stood up we were rubbish. So, one of the things we realised I think back in the 90s was that doing a better version of what you used to do wasn't enough, what you needed to do was to look at every detail, and the whole aggregation of marginal gains that propelled the cyclists I think in Rio every single cyclist that went to Rio came home with a medal

**Chris Sowton:** Do one hundred things one per cent better isn't it

**Stephen Heppell:** Yeah I mean it's a little bit simplistic to say, if you do 20 things one per cent better you'll be 20 per cent better but you sure as hell will be better. And we'll come to numbers in a bit because the numbers are quite scary. So, to our surprise, really, nobody had really done this work, the research data was everywhere, you know, the data on noise was very good and a lot of it came out of car design because they were worried about the impact of car tyre noise and stereo systems and at what point is it so loud you can't concentrate, it turned out to be not very loud. So we've collected all that, and thought okay, so let's look at classrooms let's start measuring the learning space, and it was a bit of an OMG moment, because, first of all I think we went into I think it was 83 or 86 examination rooms, and we didn't find one that wasn't damaging the children's prospects, very often profoundly, but worst still, we found incredible unfairnesses because, you know, kids in the dark corner and badly ventilated were always going to do three to three and a half per cent worse than the kids in the well ventilated, light corner so we thought, lord have mercy, this is bad and then the more we started looking at the data, the worse it got. So you've got so we started off looking at CO<sub>2</sub> and we thought then, back in those days, you know, we thought two and a half or 2200 PPM (parts per million) was a like lot of CO<sub>2</sub>. Nowadays, we know that a thousand is a lot. So the point at which damage occurs turns out to be much sooner than we thought. And I'm sitting here on the east coast, there's a snowdrift outside the door. The chickens are looking less than impressed. The temperature in my little room here is 16 degrees and we know that 18 to 21 is pretty optimal for learning so I'm not far off. So then we started looking at the things nobody had really thought about: humidity, noise rhythms, TVOCs (those nasty spells you get when you glue something, or fresh paint or whatever, you know) and we started to see some astonishing things. We're sitting on about five and a half million hours of data now, you know, and we saw some flipping amazing stuff. For example, just within this last year TVOCs those volatile organic compounds, have gone through the roof, and of course it's because of Covid because people are deep cleaning the classrooms so they are the cleanest desks you've ever seen, but unfortunately, in doing so they brainwash the kids. You've got kids who are never going to be ill but it really doesn't matter because they're walking around like zombies! We found in some mixed secondary schools the TVOC count went really high just before lunch, and we were trying to work out what it was but it was boys spraying themselves with Lynx before going out to a, you know, hopefully a romantic assignation. The girls on the other hand had opted for washing which was probably a better regime.

**Chris Sowton:** So old-fashioned!

**Stephen Heppell:** Yes, so last-century! So the whole thing was full of surprises and then of course there's no good rushing around shouting oh help, help, the sky is falling, what can we do about it? Turns out to be really, really easy. So for example we ran a project or BYOP (Bring Your Own Plant) and we had every kid with their own plant, we knew what the best plants were because luckily I'm doing some work with NASA which, well, anybody would want to do work with NASA! I'd always wanted to go to Mars, well, it turns out that



when you go to Mars you need to take plants with you because they'll convert the CO<sub>2</sub> back into oxygen and help things along. And NASA thought, well, I wonder what the best plants are? And so we know what the best plants are and when we started putting them into classrooms unbelievable results. You know, Chris, we were getting ADHD cut by three quarters. Kids who'd been on Ritalin, and turns out what was wrong with the kid wasn't the kid that had the attention deficit, it was the environment was deficiating their attention. And when we started graphing the difference between not opening your windows in the classroom and opening your windows or opening the door, we found that, of course, we don't open the windows. On a typical day 27 kids in a classroom, the CO<sub>2</sub> will be beyond the point when it distracts them from their learning about half an hour into the day. So, teachers wonder why their classes are always so sharp eyed at registration.

Obviously we're doing projects all over the place and transforming classrooms. We were doing one where we went into the kids, it's a one-form entry coastal school in a kind of interesting area. And I said to the kids, this was in sort of May the year before, coming up to lunchtime, who are the kids who are a bit naughty? You know, just not really on the money, they're kind of looking around and falling off their chairs and they all pointed to these boys in the corner, who were looking a bit shifty and were like, yeah, it's true, it's us. So who are the ones who are bright eyed and bushy tailed coming up to the end of the day when the mums are waiting outside? They all pointed to a mixed group by a window. When we looked at the mixed group who were all sharp as, luckily the glass was broken in the window so it was nicely ventilated, great natural light, there was an LED light above their heads. Ventilation, light, temperature was all right, whereas the boys were in the bad boy corner. So we swapped them over. I remember one of the girls saying: I've only been here an hour and I feel myself going over to the dark side!

**Chris Sowton:** But isn't that amazing because that impact that can have on a child's school career from the beginning can be enormous if they get identified as a difficult child or troubled child, and it can be just the environmental aspect of it which is the issue.

**Stephen Heppell:** It absolutely is. You know, I've stood so many times now in a class with a teacher, drawn a little map on a bit of paper and said I'll tell you about this later, turned it over and the class starts and we're a little way into it and somebody yawns, I just say to the teacher: I just noticed someone yawning. And then a couple of others start fidgeting and doing something inappropriate. I turn the bit of paper over and it says: the first kid to yawn is going to be sat there, the first kids to fidget are going to be in that area... it's starkly obvious, and just like with the Olympic stuff once you realise that there's more to it than doing what you've always done, you know, WOW and the eyes open, and it goes on.

Liverpool Football Club doing pretty well at the moment, over the last few years, they've got their Head of Data has a theoretical physics PhD, and he has 11 full time data analysts working under him and I walk into a classroom and people can't even tell me what what's the average arrival time, who is always late? I mean this is, this is kind of common sense with data really, Chris. If you if you arranged a room in a variety of zones, and the zones support a sort of carousel of pedagogy and I'm going to be in conversation with just two sitting over there, we're just trying out our conversation skills, I've got little cafe desks, over here I'm getting ready to do a presentation, and here I've got my head down I'm doing quiet reading and work, as I move from one area to another it all kind of improves. And we know that the flow of blood to their brains because we can map it these days with functional MRI scanners, their brains are more active if they move within the lesson, I mean, you can see it, one brain's lit up like a Christmas tree. Many of us, I think, have said to children before a



test, take your time, calm down, collect your thoughts, we now know maybe they'd be better off doing somersaults, it's like musical chairs, keep moving, keep moving around the room. When the test starts sit down and write but not until. However, that variety of seating has a huge impact on punctuality the kids all arrive, really early they hurry to class because you've got more choices, you know, if you turn up and the seats are the same and the desks are the same, there are seating plans, so I'm sitting next to Chris, oh, dear god... Obviously what we've learned from all this is the complexity of that and kids bite onto it and then expect, as you said nobody wants to just sit in the same seat with the same person, so they arrive late, because there's no joy in that and of course, Chris I'm a big part of this is agency, you know, the kids are fascinated by all this, and it wasn't me, it was the room

**Chris Sowton:** And just the idea that something as simple as bringing their own plant in, they identify I can make a difference to my learning and it's that individual responsibility but also to the group as well.

**Stephen Heppell:** Oh absolutely, spot on, and we've taken that further because we've made them put the plants in a white pot, because we know how important light is, and I'll come to light in a minute but, you know, the plants are absorbing light for photosynthesis so if it's a white pot, they're reflecting light back into the room. But we make each child name their plant, and there's something about it's *your* plant, you know, they get really excited when their spider plant's having babies. You know, you can get quite, sort of flustered, about it all and they, but they've got skin in the game and we've had kids who've been poor attenders who once they've got their own plant, you know, find themselves coming in because they've got family in the room. And of course the STEM kids make little Arduino self-watering kits to hang on the flower pot for 20 quid's worth of sensors and the, you know, some of the more turbulent kids try different fluids on the plant, you know I've weed on mine and I'll see what happens, you know the kind of thing, I've tried mine on Coca Cola...

**Chris Sowton:** But they're experimenting, they're critically thinking, they're reflecting on their environment and their place within it

**Stephen Heppell:** But I remember my eldest daughter coming home from her GCSE French exam in which she did dreadfully despite the fact that we spent a lot of time in France and she's a very good speaker of French and the reason was the Coomber tape recorder that she was supposed to be listening to, she couldn't hear! It's on the far side of the room, it was knackered, the room was bad, and I said why didn't you say something? And she said, it wasn't just me Dad, it was all of us! Sure enough all the people in her corner got a rubbish mark. The simple things you can do are to try and take out reverberations: if you've got a lot of glass in your room which you need, because you want the light, you're looking for lux levels above 500, I'm building, I'm only building to a thousand lux. These days, you can measure lux with your phone, a free app where you can just go and measure it. I mean I'm sitting in a little office, I'll measure this for you while I'm sitting here, you know, and the light levels in here are, you know, pretty good because I'm consciously trying to get them good. So I've got a lightmeter running on the phone, and I'm just going to grab that, so I'm actually, it's a very dull day, I'm only running at 418 lux and it should be 500. If I just open the window and shove it outside, dark sky, it is snowing at the moment. And I'm, I'm way over a thousand. And I'll tell you if it's a sunny day, we'd be over 10,000. Most of the classrooms I go into are 150 to 200 way too low for the bit of your brain that needs to do language. We've had kids sitting around the floor just shouting on the floor, measuring with the decibel meter, decibel meter runs on your phone and, tried different



covering: what happens if we put a rug in the middle of the floor? Well you would be amazed at the difference it makes, so I hang a rug on the wall, that all works, and also I know this is bizarre, but opening the door makes the room quieter. And we've spent a lot of time modelling that, you know, a big room with a hundred kids in the doors and everything wide open. The kids are quieter, they might have a noisy moment right at the beginning when they're all: Hello Chris! Morning! How's your dog? Did your dad come home? And some are shouting out across the room, but then they just get on and work. Whereas in a constrained classroom they're quiet at the beginning because it's boring and then as you get towards lunch, they fidget, noise goes up and down, the afternoons are usually a write off because kids are noisy: noisy, shut up, noisy, shut up, noisy, shut up, sod off, go home. You know, it's a pretty dismal sort of, and any which way we measure it closed rooms are the doors shut are noisy and teachers often don't want to open the door because it's noisy and they don't want other teachers to know that, understandably, but take the doors off, you know. One of my favourites if there are senior managers listening to this is to just say: look closing a door is a cry for help. If you have a situation in your room and you can't manage, shut your door and a senior manager will come in. That works real good, every time you shut the door some clueless deputy leaps in as if 'how can I help?' Well, if you were any good you wouldn't have got

**Chris Sowton:** Make that mistake once and once only!

**Stephen Heppell:** But it does keep the doors open, and of course, with Covid, that gives you the ventilation with CO<sub>2</sub>. CO<sub>2</sub> is a heavy gas. So if you only open the windows it only goes out above the windowsill, open the doors it goes out down where the kids' heads are on the desks. So doors open is a great thing for controlling sound, and so on.

**Vox pop:** They say the greener the setting the more we breathe, this leads us to our school buying indoor plants. It all started in 2016, when a parent joined an open door session in our school, and shared his feedback stating: the classrooms look heavy, and the children are not able to breathe fresh air. Our principal took this very seriously. She had a plan to bring in indoor plants. In order to check if they were purifying the air or not, she installed an instrument to check. To make learning fun and impactful, our school has taken every possible step to create an environment that keeps us close to nature. We have five different indoor plants, approved by NASA, which include English Ivy, rubber plant, money plant, etc. These plants help in making the overall atmosphere positive. We have ten plant pots in each classroom, looking at them every day makes our day bright. Our principal is a key climate influencer, and this is one of her many steps to keep us in touch with nature. Thank you.

**Chris Sowton:** According to a recent report by the United Nations, Palestine faces a huge number of environmental challenges, including biodiversity, water, land and soil degradation, the depletion of natural resources, urbanisation and waste management. Temperatures are set to rise and rainfall is set to fall, access to water is a particular challenge with only one in ten households in Gaza having access to safe drinking water, and more than half the wells in the West Bank, drying up in the last 20 years. In this episode's From the Field, we journey to Palestine to discover how the non-governmental organisation, the Hands Up Project is linking climate education and learning English in innovative and interesting ways.

**From The Field:** The Hands Up Project is a UK registered charity, that's been operating for about six years now. And what we do mainly is connect young people in schools in



Gaza, and other parts of occupied Palestine. In 2019, we were awarded a British Council ELTon award for our work, encouraging young people to create their own short plays. And from this idea, we've now developed what we think is our own genre of theatre, we call it remote theatre. And this is where young people are creating plays that can be performed through Zoom, there's a new form of remote theatre which we call lockdown theatre, where young people are performing plays individually and I mean collaboratively, but performing them on individual webcams. It's a fantastic way of making a connection between young people. So, what often happens is the group of kids in Gaza, say, might perform their play to a group of kids in, say, Spain, and then they'll perform another play back to them. And then this is a kind of springboard to discussion about the issues that are in the plays.

Welcome to Earth is a play that was created and performed by Madmoud Kafafi, Rida Amori, Ahmed Afghani, Abdul-Rahman Madi and Ahmed Abboush from Askar Boys UNRWA school, in Nablus in occupied Palestine, with the support of their teacher. And this play, tells the story of a group of aliens who land on Earth in a spaceship, and they go around and they have a look at what Earth is like, they notice all the problems, all the environmental problems that there are on Earth, and they discuss them, and then they have to make a decision about whether they're going to stay on Earth and try and make it better, or whether they're going to leave, and look for another planet.

Wasfi, could you tell us about the context of Askar refugee camp?

*Like other camps, Askar refugee camp was established in 1950 in the area of the city of Nablus, about five kilometres from Nablus, to the east of Nablus, the size of the camp is about 200 square kiloms. The people, it's overcrowded about 15,000 refugees live in this camp. The life of the people there is miserable.*

So you're an English teacher, but do you see your role as also teaching kids about environmental issues? Do you think that it's important for teachers to focus on these issues in the classroom?

*Yes, of course, I usually do that in addition to the topics that we have in the curriculum that we teach the students. I sometimes mention some environmental issues and talk about it with students, and try to warn them, try to teach them something about the importance of their environment, to pay attention to the environment.*

So, we'd love it at the Hands Up Project if, wherever you are in the world, if you try to make your own version of this play: Welcome to Earth, because I think it's, it focuses on issues that are so relevant to anyone wherever you are. If you do manage to make a performance of it, then it would be great if you could present it, and perhaps perform it back remotely to the original authors in Palestine, or just make a video of it, and we can share it on our YouTube channel. It's actually a positive thing that has come out of this global crisis is that there's so much more collaboration between students and teachers around the world. The thing about environmental issues is they're not confined to one particular place, and they're global issues and we all know that now, any impact that happens on the Amazon, or in Antarctica and the Arctic is going to affect all of us in the whole world, whether we live in rich nations or poorer nations, or whoever we are, we are going to be affected by these global issues, so it's, it makes sense that students of English in different countries around the world are creating remote theatre around the theme of environmental issues.

**Chris Sowton:** We now rejoin Stephen Heppell to find out more of his insights into creating green classrooms



How, Stephen, can we link developments in the classroom environment with the wider climate crisis? Where do you see the relationship between those two things?

**Stephen Heppell:** Well I mean, I mean, Covid has been horrid because of the number of deaths and so many people hideously injured with long Covid. But beyond that has been a blessing. And it's been a blessing because it's opened everybody's eyes to outdoor learning again, you know, it seems bizarre that we spent a lot of time inside the classroom, and everybody listening to this will remember a time when they did learning out of doors, and it was a memorable moment. So outdoor learning is really, you know, we've got Covid for the next six, seven, eight, nine years, it's not going to be a 'don't worry, back to normal by Christmas'. The ministers might dream of that because it's all they know, but the reality is, we're in a different world now and we are in a different world climate, too. So, being out of doors and suddenly we're acutely aware of pollution and we're acutely aware of, you know, the CO<sub>2</sub> level of the planet is up to nearly 400 parts per million now, used to be about 270, so that's getting worse, and it's nothing like being *in* the planet to be *aware* of the planet. We, on Brightlingsea, we have a beach school runs on the beach here, with our preschool kids, and they're down with little digital microscopes looking at the sand, looking for, oh, there's a little, I'd found a little red spot! Yeah, that's plastic. Really? Oh no! And those kids, they know the, you know, they know the wildlife timetable better than the local fishermen, you see them say, oh, I see the baby crabs are in, oh, really? Because they're there every day looking at all this, and I think we've made a big mistake to take learning away from the planet and put it in its own special box, you know, and learning's escaped that's what's happened it's sneaked under the door and the kids have gone with it and Covid has been, you know, a bit like Steve McQueen in the great escape. They got away. Because we've been a conspirator in all that.

**Chris Sowton:** Yeah, you say your nice phrase that it's sort of, you know, it's escaped from out of its box. But do you think worldwide it's going to be put back in its box, as soon as is able because there seems to me there's a systemic belief that learning outside was only something you do that primary level but once you get to the serious aspects of secondary learning or tertiary learning that goes away again and it should be inside a classroom, and all those other things.

**Stephen Heppell:** No, because I've never seen anybody say that PhDs can only be done indoors, and you know I've had a great track record of PhD students, and you know they do it where they live and they're outside and we know that. Kind of interesting just putting a Covid spin on this for a moment because there's been a lot of complete tosh talked in the media about Covid kids needing to catch up and, oh heavens to Murgatroyd they need to be back in the school, you know, but we know that the very opposite is true of kids out there, almost all of them, but not all so there's an equity issue, that most of them have been pursuing lots of things in depth, they've been looking at rocketry, and they're doing baking, they're doing living history talking to their grandparents more than they've done for a long time they're, you know, they've really thrown themselves into their learning and what they've developed are really key third millennium skills of, you know agility, of innovation, resilience, I mean, think about all the things computers can do. Computers never tire, computers do batch processing, computers do what they're told, computers do repetition, computers do memory, so the last thing we need is a generation of kids who can only do those things, we need a generation of kids who are ingenious and curious and can exactly as you say be resilient. You know, if I look back, when was the last time we had a generation like that, it was second world war, when all those kids were evacuated for three years and people bombed them and heaven only knows what they went through, hiding in





the bomb shelters every night in the garden or going down the underground, and yet that lot, that generation gave us, Vivienne Westwood and Paul McCartney and Colin Chapman and the geniuses, the engineering, science, music, art, design geniuses that we rebuild Europe on for 20 years after the war. Well, this generation of kids with all the things they learned out of school are our golden generation, they're our most precious generation and the sad thing is that we've got, it's not the politicians' fault that they can't see that, because they're a generation who've only ever seen the same thing. They've sat in the seating plan, they've done the daily timetable, they've only ever faced certainty. So when they're faced with uncertainty, they say, oh, let's get back to where we were, get back into school, get them sat down again, in fact get them all facing the same way I'm sure Covid needs that. They kind of locked on to, that's not their fault, but they are stupid, you know, that's the truth of it, you know, and also the generation that is this golden generation, you know before, there were the few exceptions the Greta Thunbergs and the, you know, the kids in Hong Kong or whatever they were kind of, you know saying a bit about what they thought would happen, it's every kid now. Every kid has been given agency, they've tasted the difference, and the genie has gone out of that bottle. I've talked to 103 ministers of education in the last 11 months, for which I think there's some sort of medal should be struck! And actually, some of them are pretty good. I don't have a collective noun though. But two thirds of them are saying is a real opportunity to build back better, and one, the third is saying, I mean it's kind of what happens around the world, you know, if I go to some countries, they don't look at the cost of education, because they know whatever they spend they'll get it back on the rate of return, you know, Singapore doesn't say how much is that they say how many do we need because whatever they buy, five years down the track national income goes up when they get the money back, and then about, about a third of the world says, how can we do the same but cheaper, well do the same but cheaper got us one gold medal in Atlanta, and you know it's dead in the water that approach, it really is.

**Chris Sowton:** What would you say, because in my experience of working in the Global South, you often find actually, there's very strong views towards the idea that education should be within a classroom because it feels there is some prestige attached to that especially in environments where education hasn't been something that everybody has done from the age of four onwards, what are in those sorts of environments where even if it's just a concrete shell with poor ventilation and poor windows but yet, people say there's parental pressure institutional pressure saying, that's where learning should take place?

**Stephen Heppell:** Well, I mean, that's what they've been told. And, you know, if I go to some of the desperate bits of West Africa or whatever where, you know, hugely generous people often stars, Oprah Winfrey or whoever you know have parachuted in and built fabulous schools, you know, but only one or two there isn't, isn't one for everybody. And I was doing an assembly with some kids in Islington the other day just in passing, talking about safety, and I showed them some of the journeys to school that kids enjoy you know, the climbing across mountain passes, you know swinging across a river on a lorry and a tube and of blinking hippopotamuses in the river, and it just basically two hours of mayhem to get to school, they get to school they go into that concrete box they sit down, they learn about terminal moraine, there ain't no glaciers in Africa, I tell you, and then they go outside they battle all the way back and of course, the learning bit was the journey, if somebody just said that we'll look at the flora and fauna and think of the engineering of swinging that rubber tube across the river on the end of the bit of rope and, you know, what do we know about conservation of energy and, you know, once the learning is grounded in the place you live, they're not going to get you out of that place and put you back in your box and that's scary and there's some interesting politics about all this because roughly every 75



years you've get a big change so in 1800 churches around Europe said we want everybody to learn, but the big book you know, that's really important because that's about social behaviours, you know, Thou shalt not dot dot dot, you know, and then 75 years after that, we had, in England, we had the 1870 act and most of Europe around about then because they had industrialisation and they needed kids who could do a bit of maths, tell the time, reading a note that said danger. So compulsory primary education came along. 75 years after that, you are with that wartime generation who have been evacuated in England in 1944 Education Act and very similar in France and Germany and elsewhere, but it's interesting that the church was driving it, and then the employers were driving it, and then after the war it was families who drove it because they saw the lack of, and this time around it's kids who are driving it, but as every 75 years somebody's given the baton and told them make it better, and those have been the really big leaps forward for education and we're right in the middle of one right now. And a few people will go back, but not very many.

**Chris Sowton:** With regards to, especially with regards to learning English in places all around the world, again going back to this idea of using the environment around you, all those sorts of things. Do you see that impact taking place on language learning and English learning in particular because it seems to me often it's presented as a prestigious good. You know, it's about the product of gaining an English language ability in terms of grammar in terms of vocabulary and so on. Do you see these things impacting positively on how English is taught and how English is learnt, or do you think English is somehow separate from many of these other areas that you're, you're talking about?

**Stephen Heppell:** I mean English has the lucky history of becoming that hugely significant language which in many countries even affects who you're going to marry, who you're going to work with, what opportunities you have, and there's a really interesting question in all this which is as we go global and live locally so you know, I'm talking to three or four countries a day from this desk, and yeah, you know, I live in a little tiny village by the waterfront and I sail a hundred-year old boat, you know, so there's a kind of local-ness to all this and there's a global-ness to this and there's a difference here between working with people on your line of latitude, where I can take my project, send it to the east coast of America, onto the west coast, out to Hawaii round to, where are we, Japan back to India, Eastern Europe and home and while I've been in bed it's been its been in five, five other sort of places or working my line of longitude where, you know I'm having lunch in a minute, well I probably am actually, and so are they in Johannesburg and let me show you what I've got ooh, crikey, we haven't got that. So the longitude and latitude workers, and latitude and longitude families, for that matter, are very different styles and approaches and for one you really do need a real time communication code and English is going to be that for a long time, for the latitude ones is maybe you can get away with all sorts of languages because technology is going to help you out and you're not talking in real time. I mean we're building a school at the moment in Ireland, which is a modal school is first one in the world, and we're saying there is no difference between being online and being face to face, you know you're the group of kids you're working with, the collaborative project you're doing, the youngster that you're mentoring, the pastoral support you got is the same whether you're there or not. And nice to come in, your parents go off abroad for two terms, you can go with them and you can still be working with your mates, you can still be doing everything you know. And you can see education heading that way quickly. The thing that becomes important is membership, what do I belong to, who is my community and, you know communities and membership sometimes need a language and for now I think English is very much that placeholder, I could see that being Mandarin not so far down the track, too. Yeah.



**Chris Sowton:** Brilliant. Thank you very much for your time today Stephen, that was fantastic.

**Stephen Heppell:** Well thanks for listening, folks, and you know I've been doing this for a long time. Professor 31 years ago, whatever, the decade ahead is looking set to be the most exciting time I've ever seen, and I absolutely can't wait, it's in the hands of the kids, they've picked up the baton, they've escaped. We don't know where they're going but I'm running like hell to keep up with them and it's just the most exhilarating time.

**Chris Sowton:** Brilliant, thank you very much. Thanks to Stephen for sharing his fascinating and innovative suggestions, please visit his website, [heppell.net](http://heppell.net) to discover more about his ideas and insights.

Compounding is a very common way that new words and phrases are created in English. In this episode of The Green Glossary, our partners at Oxford University Press explain the process in doing this by looking at a climate related phrase, which is a wide usage: carbon footprint.

**Sting:** The Green Glossary. The Green glossary. Brought to you by Oxford University Press.

**The Green Glossary:** Hello, my name is Rosamund Ions and I'm an editor involved in revising the Oxford English Dictionary. Like a lot of terms to do with sustainability, carbon footprint doesn't have a particularly long history. It's modelled on earlier terms such as environmental footprint for which the earliest evidence we've found so far is from 1979, and ecological footprint, from 1992. This quite abstract and metaphorical use of footprint may in turn derive from a cluster of earlier 20<sup>th</sup> century uses of the word broadly meaning 'the area occupied or affected by something'. Our first evidence for *carbon footprint* comes from the late 1990s, but it seems to have been popularised around 2005 in a public relations campaign run, ironically, by the oil giant BP. In it, they acknowledged that it was an unfamiliar term: 'What on earth is a carbon footprint?'; they asked, before going on to provide a definition, and then inviting individuals to calculate their individual or household impact in terms of emissions. Some parts of that campaign used text laid out in the shape of a footprint to reinforce the metaphor, and perhaps to give the problem a human dimension, or, it might be argued, to deflect it from big corporations on to individuals! Greenwash or not, it seems to have captured the public imagination, because we see the same metaphor occurring in many other languages, for instance Spanish *huella de carbono*, French *empreinte carbone*, German *Kohlenstoff-Fußabdruck*. The image of a footprint has continued to lend itself nicely to graphics that can be used to engage an audience with what's quite an invisible and intangible concept, and perhaps helps to make it a bit more accessible to a non-scientific audience. We'll come back to the use of metaphors and how they can help to get a message across, or not, in another episode. In addition to using an image as well as words to get a concept across, part of the success of the term carbon footprint may be that it manages to contain a lot of meaning in a small linguistic package, and I thought it would be interesting to unpick that a bit.

So, carbon footprint is an example of a compound noun, which is a very common way of forming new terms in English. It allows us to put two nouns together, generally with the first one modifying the second one (so it's functioning more like an adjective) to create something that is often more than the sum of its parts. It's a way that English has to avoid



the need for longer phrases. Some languages that don't tend to form compounds in this way vary between noun phrases with a genitive construction and nouns modified with an adjective. For example in Italian, which is the language I'm most familiar with after English, you find both *impronta di carbonio* – which literally means 'footprint of carbon' and *impronta carbonica* which uses an adjective, so it's something like 'carbonic footprint'. (That said, in Italian the English 'carbon footprint' is probably just as common if not commoner, maybe because it's more usual to refer to carbon dioxide as *anidride carbonica* rather than *diossido di carbonio*.) Now, carbon footprint uses another device to convey more meaning in a concise way, because carbon is being used to stand for something like carbon dioxide and other carbon compounds in the form of gases that contribute to global warming, which is obviously a bit of a mouthful and doesn't lend itself easily to forming compounds! In another episode, we discuss a similar example of shorthand going on with some compounds of 'climate' where it's used to mean 'climate change': so for example a 'climate denier' is not someone who denies that climate is happening but someone who denies that climate change is happening.

Although it comes at the potential expense of comprehension, because it could be misunderstood to mean the element carbon rather than carbon dioxide, or carbon dioxide and other greenhouse gases, linguistic efficiency has contributed to the success of this use of carbon, and in fact you can see evidence of the term for the element 'carbon' coming to have this wider meaning in many other languages, for example Spanish *huella de carbono*. The French *empreinte carbone* is perhaps influenced even more strongly by English, because *carbone* in *empreinte carbone* is a noun functioning as a modifier of the first noun. It would be interesting to investigate whether the global dominance of English is influencing the formation of compound nouns in languages that don't traditionally do this as often as English; for instance I've noticed that in Italian the greenhouse effect is often referred to as *l'effetto serra* rather than, say, *l'effetto di serra*.

Coming back to English, we find that in the late 20<sup>th</sup> century this use of carbon starts to become very productive. For example, we get carbon emissions, carbon sink, carbon offsetting, carbon tax, carbon-neutral, etc. And while a lot of compounds like carbon footprint have to do with defining the problems underlying climate change, increasingly we're seeing coinages referring to possible solutions, for example we're monitoring terms for new technologies such as carbon capture and carbon scrubbing. This pattern of productivity often occurs with compounds: once the usefulness of the first element in its modifying use has been established in one or two cases, other uses start clustering around them and creating a sort of family of related compounds. There are plenty of examples of this happening, and we can see that this helps to tie together various bits of the sustainability conversation. For example, climate in words such as climate change and climate emergency links also others such as climate justice, climate refugee, and climate sceptic; while greenhouse in greenhouse effect is later joined by greenhouse gas. Carbon in this sense turns up not just as the first element but also as the second element in compounds such as low-carbon and zero-carbon. Another example of a group of compounds in the world of climate activism are those linked by having strike as their second element: we have climate strike and school strike which recall each other not only semantically, but also link historically to earlier instances of non-violent protest found in compounds such as hunger strike or rent strike. The second element of carbon footprint



creates a relationship with another family of compounds such as environmental or ecological footprint, and later footprints modelled on these, such as water footprint which we date to 2002, and others which we're monitoring, such as land footprint and plastic footprint. I think the way that compounding creates this web of interrelated words and mental associations is quite powerful: you can have a lot of fun tracing the ways different words are linked by compounding within the ecosystem of English!

**Vox pop:** My name's Steve, I work in Thailand with grade two students. In science we were speaking about global warming and recycling and in one of the lessons on English we were speaking about music and I decided that the kids could make a class band, and practice words like hit and play and strike and so on. But we decided that we would make our instruments out of recycled materials so the children collected recycled materials like bottles and sticks and so on and they, they made instruments out of whatever that it was that they had, so they had shakers and drums, and together we made a class song, and recorded it and sent it home to those parents and the kids really loved playing the music with the instruments that they had made. And I don't think that the recycling message really was the focus but there was some sensitivity of the usefulness of recycled materials as a way of, of having fun and playing and I think that that worked quite well with the children.

**Chris Sowton:** That's all for this episode of the Climate Connection for show notes, bonus material and previous episodes, please visit the show website, [www.britishcouncil.org/climate-connection](http://www.britishcouncil.org/climate-connection). Join us next time for Episode Six: Global Schooling, in which we discussed how educational institutions can minimise their carbon footprints, until then, goodbye.

