Learning about trees: thinking about roots

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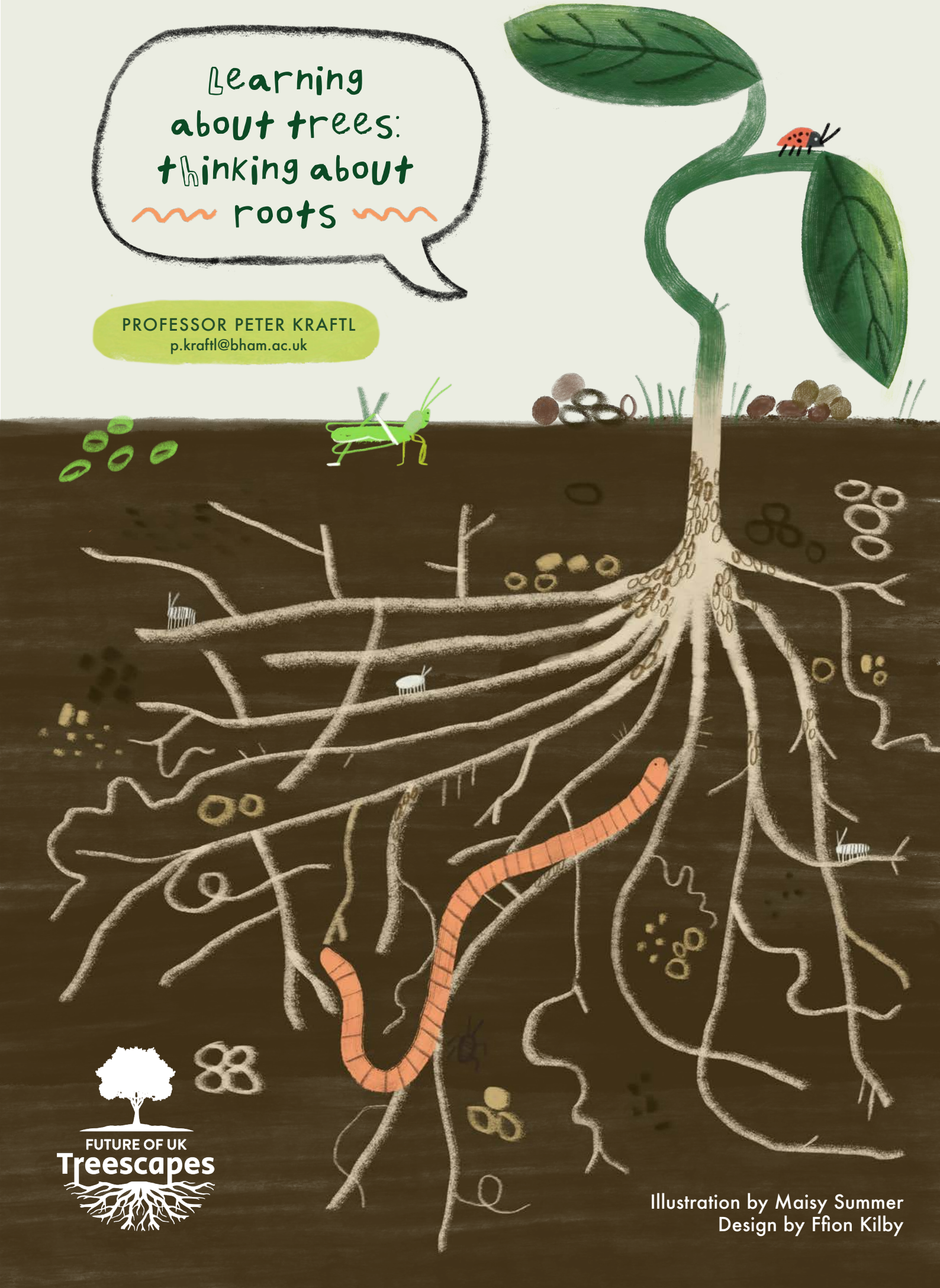


FUTURE OF UK Treescapes

Illustration by Maisy Summer
Design by Ffion Kilby

Introduction

Environmental education and Education for Sustainability are often highly didactic.

> Children are required to learn 'facts' about issues like carbon, climate change, and environmental degradation.

They are also taught a range of strategies and behaviours that could have a positive effect on the environment (sometimes called 'environmentally-relevant behaviours').

Yet whilst learning these facts and strategies is important, environmental education also runs the risk of being exclusionary, in a couple of ways. On the one hand, it is dominated by 'scientific' knowledge, and often – especially in secondary schools – taught in disciplinary silos. Other approaches to knowing, engaging with and feeling the environment can be ignored. On the other hand, suggested strategies and behaviours might not be socially or culturally appropriate for all groups – whether in terms of gender, cultural or religious beliefs, disabilities, or more besides.

Since trees are a kind of 'charismatic' class of species, and in countries like the UK there are concerted efforts to plant more trees to sequester carbon, they offer an important starting point for children's environmental learning. This resource offers a set of prompts for considering how else children might learn about trees, with a focus on thinking about roots.

Underpinning research

This resource is based on a major research project funded by the UK Government's main funding body, UKRI. *The Voices of the Future*[1] project (https://treescapes-voices.mmu.ac.uk/) sought to understand children and young people's knowledge of, feelings about and engagement with trees. The academic researchers worked closely with children and young people in diverse settings, including early years groups, primary schools, secondary schools and a group of older young people who were claiming asylum. We also worked in diverse geographical locations – including inner-city Manchester, Aberdeen and Bolton.

Like many scientific studies, much social science research about children, young people and the environment has tended to assume that children – like all humans – are 'separate' from nature. Therefore, as indicated above, it has tended to evaluate children's learning *about* nature, or how effectively they acquire and display environmentally-relevant behaviours. It has also treated children as research subjects, 'extracting' what they know through surveys or interviews.

Voices of the Future explored a different approach. On the one hand, and in line with the work of the *Common Worlds Collective*[2], it sought to see children – like other humans – not as separate from nature but as 'entangled'. We are made up of all kinds of organisms and materials, which enter and leave our bodies every day, often without us knowing. We interact with – and cannot do without – nonhuman entities like trees: they are part of our lives, not separate. On the other hand, the project sought to co-produce research with children and young people (and their relevant adults, including teachers). They became co-researchers, helping the team to ask and answer research questions, to collect and analyse data, and to present it in various forms to different audiences.

Working with schools, the *Voices of the Future* team developed interdisciplinary sessions – combining art, science and social science – through which children might produce and experience different kinds of knowledge and learning about, and engagements with, trees. This resource examines and prompts reflection on one such session, which focused on tree roots.

[1] Grant reference number NE/V021370/1

[2] http://commonworlds.net/; the Collective's publication for UNESCO – Learning to become with the world: Education for future survival – provides a detailed overview of their approach: https://unesdoc.unesco.org/ark:/48223/pf0000374032

The session in schools

THE FOLLOWING ACTIVITIES ALL TOOK PLACE DURING ONE SESSION EACH WITH SEVERAL YEAR 3 AND 4 CLASSES, AND MIDWAY THROUGH THE VOICES OF THE FUTURE PROJECT; BUT THEY COULD WITH A LITTLE FURTHER SCAFFOLDING AND/OR RELEVANT LINKS TO RECENT CURRICULUM TOPICS, BE USED AS SHORTER, STANDALONE ACTIVITIES, OR IN COMBINATION WITH OTHER LEARNING ABOUT TREES.

1 Draw a tree on your project notebook

15 Minutes

NO FURTHER INSTRUCTIONS.

- Researchers and teaching staff circulate with simple prompts: 'tell me what you've drawn'; 'compare your drawing with others on the table'; 'what made you imagine the trees this way or that way'
- As a class: ask what was missing from their pictures; children tend to forget about the roots – prompt them to think about this, and why this might be the case

Let's look at different root shapes 2

EITHER WHOLE-CLASS OR SMALL-GROUP ACTIVITY.

15 Minutes

- Show root visuals (two-dimensional side-view images) of different tree species in different locations/conditions (e.g. on slopes, in poor soil)[2]
- Ask children questions like: 'what are the roots doing under the ground?'; 'are they standing or lying down under the ground: spreading horizontally or penetrating in a vertical way?'; 'what might influence what shape the roots take?'
- Adults leading class can offer responses if they feel equipped to do so.

[2] These kinds of images can be found in various sources online, but a good example is: Browse - Wageningen University & Research - Image Collections (wur.nl)

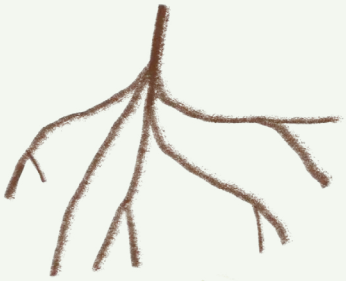
3 Root modelling

40 Minutes

CHILDREN WORK IN SMALL GROUPS.

- Each child will be given 5 pipe cleaners to model a tree (trunk+ branches). After that, each child will be given extra 4 pipe cleaners to model the roots for their tree

- Children can talk to one another about their trees. What are their roots doing? Why do they look like this?



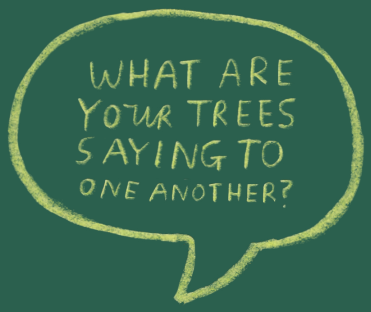
- Refer children back to the root shapes exercise and ask: 'how might you modify your roots (and your trees) under different conditions' (e.g. wet, dry, poor soil, in a container in a city centre)?

- Sandpits are brought around the tables. Ask the children to place their trees in the sandpit. Ask them why they placed their trees in this way. Ask them to compact the sand and try putting the roots in, and then to loosen the sand and do the same. Encourage children to think about how different kinds of soils might be the result of human activities.

4 Tree stories: communication and the future

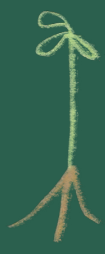
ENCOURAGING DIFFERENT KNOWLEDGES AND NARRATIVES ABOUT TREES ('BEYOND' THE SCIENCE), INCLUDING THE IDEA THAT TREES ARE 'ACTIVE' (THEY CAN COMMUNICATE WITH EACH OTHER AND WE CAN LEARN FROM THEM, NOT JUST ABOUT THEM)

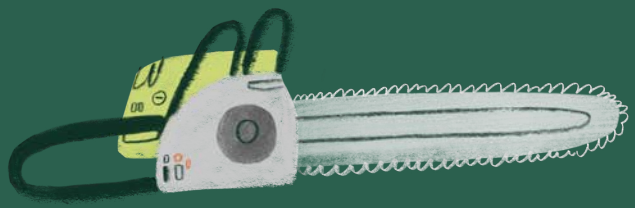
15 Minutes



- Trees communicate through their roots. Imagine you are building a story with tree characters. Ask: 'what are your trees saying to one another?' (record the stories by recording on an iPad, by drawing, or writing); 'how can humans communicate with trees?'; 'what can humans learn from trees?'

- Think about your tree story in the future (could link to English curriculum – alternative endings). Ask: 'what will happen to your tree model if it...gets hotter...wetter...buried with tarmac... hit with a football...climbed by other children...cut for timber?'





The aim of these activities is also to encourage children to bring in their own experiences of trees (this could be facilitated through more direct questions) – in their gardens, local parks, play, holidays, in places they have lived previously, where their families live, both near and far. Finally, it is an invitation to children to speculate and, possibly, imagine more hopeful futures for trees, especially in light of contemporary anxieties about the environment and habitat loss.

Reflections

This resource and the activities above are an invitation to consider how else learning about trees might take place in the classroom. They are also

an invitation to work with children to bring together questions, activities and learning

from across the curriculum, opening out the possibility for thinking about how they – and all of us humans – are entangled with the nonhuman world. This world includes trees, but this resource invites reflection on our (dis)connections with other plants, animals, geological processes, and more besides.