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ARTICLE

Animating Soil: Cultivating Young Children's Soil Relations

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Abstract
This article explores young children's relations with soil, drawing on research that positioned soil as animate, lively and interconnected. The paper investigates how animist approaches offered a mode of encounter for children and their teachers, encouraging them to see themselves as part of a larger ecological community. The research began with a "soil biome immersion" experience where teachers engaged with soil through sensory and arts-based experiences. These initial encounters led to further exploration of child-soil relations through experiential learning and storytelling. Children, as active meaning-makers, co-constructed the inquiry through imaginative and sensory engagements. Findings suggest animism cultivates soil relations, challenging traditional notions of soil as inert and promoting a dynamic understanding of soil ecosystems. Through practices such as storying, drawing and listening, educators supported children's animist perspectives, deepening their attunement to the more-than-human world. This article contributes to environmental education by demonstrating how animism can enrich children's ecological awareness and their sense of connectedness to the world.

Keywords: Child–soil relations; Animism; Grammar of animacy; Pedagogical documentation; Reggio Emilia; Early childhood

Introduction

Animism, conventionally understood in Anglo-European worldviews as a belief in non-human spiritual essence, has been redefined by contemporary scholars. "New" animists including Graham Harvey (2006) and Nurit Bird-David (1999) argue that animism is not about "believing" in spirits but acknowledging interconnected, reciprocal relationships among all beings. Instead of seeing animism as a primitive belief system, new animists regard it as "not a doctrine or orthodoxy, but rather a path, a way of life, *a mode of encounter* [emphasis added]" (Rose, 2013, 1) that invites respect, reciprocity and attentiveness in a more-than-human world. Animist worldviews posit that "the world is full of persons, only some of whom are human, and that life is always lived in relationship with others" (Harvey, 2017, xi) where persons can be fish, birds, plants, stones, weather, places or things. Indigenous scholars, such as Robin Wall Kimmerer (2013), a botanist and member of the Citizen Potawatomi Nation, emphasise animacy's role in maintaining respectful more-than-human relations. This *relational* worldview, where humans and non-humans are active community participants, challenges perspectives that place humans at the centre (Rousell & Tran, 2024; Tynan, 2021). Within this context, soil is both vibrant matter (Bennett, 2010) with capacity to affect and be affected and alive with microbes and other critters. Soil thus blurs conventional boundaries of alive/not alive, pushing us to envision human-soil

relations where humans are not at the centre but are instead part of a dynamic, interconnected world of many worlds (de la Cadena & Blaser, 2018).

Drawing on our research exploring young children's relations with soil, this article proposes that animism offers a mode of encounter for young children to engage with soil with "attentive presence, knowledge and gratitude" (Rose, 2013, 94). Young children often exhibit animistic tendencies that reflect a relational orientation whereby materials and beings are perceived as sentient and responsive. However, as children enter formal schooling, dominant scientific discourses and curriculum frameworks may encourage more rationalist, mechanistic understandings of the world. This shift can marginalise animist ways of knowing, positioning teachers' efforts to sustain relational and animist thinking as counter-hegemonic.

Within this context, our study began with a *Soil Biome Immersion* (Reed, 2022) for teachers, led by multidisciplinary visual ecologist Aviva Reed. The experience positioned soil as animate, lively and interconnected. Teachers also received *Nema and the Xenos: A Story of Soil Cycles* (Wild, Barr, Crocetti & Reed, 2019) a book illustrated by Reed using animism to convey soil's liveliness. These initial experiences informed the research, which explored child-soil relations through experiential learning, arts-based experiences and storytelling. This article reflects on the question: *What opportunities arise from incorporating animist approaches into environmental education for children?* By addressing this, the paper seeks to explore how animism might reconfigure soil relations nurturing deeper connection and responsibility towards the world.

Conceptualising soil

In educational and scientific contexts, soil is often framed by its chemical and physical properties. Yet soils are complex "bioinfrastructures" (Puig de la Bellacasa, 2014), containing about a quarter of all identified living organisms (Evans, 2021). One teaspoon typically holds over 10 billion microbes (Needelman, 2013), yet public and scientific discourse often focuses solely on soil's chemical and physical characteristics. Categorising soil merely by its chemical and physical composition positions it as a human resource—for food production or for construction (Krzywoszynska, 2019)—overlooking it as a "multispecies world" (Puig de la Bellacasa, 2017, p. 172) and as vibrant matter (Bennett, 2010) able to act on the world. Soil extends far beyond its visible surface. It is in deeply entangled relations, not only physically, but also politically, socially and practically. It inextricably affects and is being affected by human actions and systems. For example, in early childhood education, sandpits, gardens and mud play illustrate how soil is embedded in practices and policies, shaping and being shaped by human interactions and institutional frameworks.

How soils are conceptualised significantly influences how humans interact with and manage them (Krzywoszynska, 2023; Puig de la Bellacasa, 2017). Foregrounding soil's inherent liveliness has potential to nurture more caring and ethical human-soil relations (Puig de la Bellacasa, 2019). Similarly, understanding soil as a complex, life-sustaining web and acknowledging its intricate relationships and processes is critical to re-embedding people within soils and lands (Krzywoszynska & Marchesi, 2020). However, in Anglo-European early childhood cultures, soil is frequently positioned as something to be avoided or cleaned away to keep children safe (Mycock, 2019). This is influenced by societal norms emphasising cleanliness and hygiene. Insights from Discard Studies (Liboiron & Lepawsky, 2022) highlight how attitudes toward dirt and hygiene shape interactions with soil. For example, because soil-transmitted helminths are linked to poor hygiene (World Health Organization, 2023), soil is often framed primarily as a vector of disease rather than a vital ecological component. This framing can influence how children are taught to interact with soil, promoting avoidance over engagement. Recognising soil's role in broader ecological processes can shift this narrative toward a more balanced understanding

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of soil as both a potential hazard (Strunz et al., 2014) and a crucial element of Earth's critical zone (Latour & Weibel, 2020) with which children are intricately entangled.

Animist approaches complement scientific perspectives by inviting relational and ethical engagement. Rather than replacing scientific knowledge, animism foregrounds soil's liveliness to cultivate attentiveness, reciprocity and care. This dual framing allows soil to be encountered not only as a complex ecological system but also as living kin, capable of shaping and being shaped by human and more-than-human relations.

Animism

New animists define animism as an ethical commitment to mutually respectful and caring interactions within more-than-human worlds (Harvey, 2006). Bird-David (1999), in her studies with the Nayaka people of South India, describes animism as a "relational epistemology"—not merely a belief system but a way of knowing and being. The Nayaka perceive their environment as a community of related humans and non-humans. Bird-David's work underscores animism as a lived practice shaping everyday interactions and relationships.

Tim Ingold (2000, 2011) also informs contemporary Anglo-European understandings of animism by exploring cultural perceptions and interactions with environments. Ingold argues animism involves seeing the world as a relational network, where humans and non-humans co-participate in a shared existence. He contends that for many Indigenous peoples, animism is not about projecting life onto inert objects but recognising the world as inherently alive and constantly becoming. He terms this "animic ontology," suggesting beings emerge through relationships within a dynamic, ever-forming world (Ingold, 2006). This relational, movement-focused understanding highlights the environment and its inhabitants as part of a living, interconnected whole.

Grammar of animacy

Kimmerer (2013) proposes a "grammar of animacy," a linguistic framework that acknowledges and honours the life and agency of all beings, including plants, animals, and geographical features, by treating them as animate and sentient. For instance, while English might state, "The soil is rich and fertile," a grammar of animacy would say, "Soil is nurturing her richness," thereby recognising soil as a living entity. This grammar allows a view of soil not as an inert substance but as a vital, breathing component of the ecological community.

A grammar of animacy is evident in Australian Aboriginal ways of speaking. For example, Bill Neidjie, the last surviving speaker of the Gaagudju language, uses the pronoun "e" to assign subjecthood when speaking of stars and trees:

> E'll be there million, million . . . star.
> Because e stay, e never move.
> Tree e follow you'n'me,
> e'll be dead behind us but next one e'll come.
> Same people. Aborigine same.
> We'll be dead but next one, kid, e'll be born.
> Same this tree.
> Star e'll stay for ever and ever (Neidjie, 1989, 4)

Similarly, Nyikina Warrwa woman Anne Poelina from northwest Australia uses a grammar of animacy to tell the story of Martuwarra, the Fitzroy River:

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> I am Martuwarra, I am River. I am a living being. I have flowed, gushed, poured, streamed and pooled. Through my underground water courses and through magnificent riverine spectacles, I have created and nurtured the socio-ecosystems of aquifers, wetlands, woodlands, forests, savannah and tidal estuaries. I have provided living water to deserts. I have given life and guided culture, songlines, stories, arts and dance—the seasons, rhythms and flows of life—to the humans and more than humans of my nations since the dawn of time. Humans and their ancestors have spoken my languages since the Bookarrarra, the creation times, a never-ending beginning. I gave them these languages. We understand each other and call each-others' names. (Martuwarra RiverOfLife et al., 2022)

Using a grammar of animacy locates Martuwarra as living, sentient and deeply intertwined with the Nyikina people. It brings people and Marturwarra into "entangled human-river co-emergent relations, nurtured as co-becomings in an infinite pattern of care, kinship and response ability" (Martuwarra RiverOfLife et al., 2022, 432).

Kinship

Understanding animism as a relational ontology that recognises the personhood and agency of the world allows for expanding the concept of kin beyond the human. Animism brings forth "a world of kin, grounded in a profound sense of the connectivities and relationships that hold us together, vulnerable and responsible to one another" (van Dooren & Chrulew, 2022, 2). Kin relations are not necessarily biological. Haraway (2016) proposes "making kin" with "oddkin"—forming enduring, mutual relationships beyond biological ties—as an ethical imperative in the Anthropocene. Such relations can extend to non-human species (e.g., dogs) and to entities like rivers, trees and mountains (Arnold et al., 2021; Nxumalo, 2017; Wooltorton et al., 2022). For example, the Māori of New Zealand regard the Whanganui River as an ancestor, legally recognised as a living entity with rights (Cribb et al., 2024). Similarly, in the Andes, the Quechua people view mountains, or *apus*, as powerful deities and protectors (de la Cadena et al., 2015; Przytomska, 2019), with whom humans share kinship ties. These worldviews transcend species and biological ties, contrasting with extractivist and objectifying views that separate humans from the rest of the world.

Making nonbiological kin has long been part of Australian Aboriginal worldviews (Bawaka Country et al., 2016; Poelina et al., 2020). For Aboriginal peoples, kinship extends beyond humans to include land, waterways and sky (Poelina et al., 2023), where "[h]uman and non-human kin are of the same flesh, and what happens to one has a bearing on what happens to the other" (Rose, 1999, 179). This more-than-human relationality is often described as "Country" in Aboriginal English. Understanding Country as kin creates a deep sense of belonging and responsibility, guiding sustainable and respectful land management practices (Tynan, 2021). In the context of worldly relations, kinship offers a valuable possibility for rethinking human interactions with the world.

However, the appropriation of Indigenous concepts of kin by non-Indigenous scholars has been critically examined by Métis anthropologist Zoe Todd (2016), who calls for respectful and accountable engagement with Indigenous knowledges to ensure that concepts like kin are not divorced from their cultural and historical contexts. Furthermore, Max Liboiron (2021), a Métis and settler scholar who researches with plastic waste cautions against romanticising notions such as kin. Using plastic as an example, Liboiron reminds us that not all kin relations are positive, introducing the notion of "bad kin" relations that are harmful or exploitative. Liboiron's critical lens provides a nuanced understanding of kinship recognising both its potential benefits and pitfalls.

Keeping these cautions in mind, framing soil as animate in our research proposed a transformative mode of encounter, encouraging children and teachers to perceive soil not just as

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inert matter but as a vibrant community of living kin. Building on these theoretical foundations, this study addressed the need for empirical exploration into human-soil relations through the lens of early childhood education. Employing a participatory arts-informed methodology, the research engaged teachers and children in collaborative soil explorations. The following sections present the research design, findings and implications.

Encountering the field

The research involved a collaboratory (Hodgins et al., 2022) comprising three researchers (the authors) and 23 teachers working with 240 2-to-8-year-old children across 13 early learning sites in Perth, Western Australia. Pedagogical documentation (Giamminuti, 2013; Giudici et al., 2001; Merewether & Fleet, 2021), served as the primary method of data generation. This practice, rooted in the public educational system of Reggio Emilia, Italy, systematically collects and analyses data to understand, enhance and make visible children's learning experiences (Fleet et al., 2025; Rinaldi, 2021). Pedagogical documentation was chosen for its ability to trace the dynamic and emergent nature of children's interactions with soil. Our project deployed the following strategies:

- Teachers maintained detailed **field notes**, tracing children's verbal and non-verbal interactions with soil, their questions, comments and notable behaviours or expressions of curiosity and engagement.
- **Photographs** visually documented children's soil interactions, providing a rich, record to supplement field notes.
- **Audio and video recordings** offered an additional layer of data for nuanced understanding of children's emerging soil relations.
- **Children's works**, including stories, drawings and other creative pieces produced during and after the experiences, were collected.
- Teachers held **conversations** with children to gather insights into their views about soil.

Pedagogical documentation is a regular part of the participating teachers' practice and is integrated into their everyday pedagogical work. This minimised disruptions to children's routines and utilised teachers' familiarity with the children. In addition to the strategies above, researchers maintained field notes during discussions with teachers.

While the study involved 13 early learning sites, the vignettes and examples in this article are drawn from a subset of sites that provided particularly rich and diverse documentation. They were selected to illustrate a range of sensory, imaginative and narrative engagements with soil, rather than to be statistically representative of the entire cohort.

As researchers, we approached this study with a relational ethic, recognising that interpreting children's imaginative and animist expressions involves our own situated perspectives. Rather than seeking definitive meanings, we aimed to honour children's expressions as co-constructed, contextually grounded and shaped through shared encounters with soil. Our stance was guided by care, attentiveness and a commitment to ethical engagement with more-than-human worlds.

Soil biome immersion

As noted earlier, Aviva Reed's (2022) *Soil Biome Immersion* at the project's outset engaged teachers with soil through spoken word, sound, visual elements, lighting and tactile experiences. This experience portrayed soil as animate and the main protagonist, drawing attention to humans' ecological relations with soil and highlighting its interconnectedness and vitality. This immersive experience aimed to inspire teachers to integrate similar experiences into their classrooms, provoking children's curiosity and wonder about soil.

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Children's literature

Two children's books were also provided to teachers. These were chosen for their educational value and to build teachers' soil knowledge. *Nema and the Xenos* (Wild et al., 2019) tells the story of Nema, a nematode, and her interactions with various soil organisms, helping teachers and children visualise and understand complex soil relationships. *Exploring Soils: A Hidden World Underground* (Grover & Heisler, 2017), a non-fiction narrative by soil scientist Samantha Grover, is written from a child's perspective. It provides factual information on soil composition, types and functions. Teachers were invited to use this book to enhance their own understanding of soil science and share it with children.

Experiential approaches

A multimodal, experiential approach, informed by Reggio Emilia's pedagogical practices (Giamminuti et al., 2023; Rinaldi, 2021), aimed to cultivate a sense of kinship between children and soil. Experiences encouraging curiosity, sensory engagement and a deeper understanding of soil as a living entity offered children opportunities to observe, touch, smell and listen to soil. This introduced them to the diversity and complexity of soil ecosystems. Children were invited to describe their sensory experiences and share thoughts verbally and through drawing. In some settings, children used audio-recorders to explore sounds from the soil's perspective.

Throughout these experiences, a grammar of animacy (Kimmerer, 2017) was supported by encouraging children to see soil as a living entity with its own agency and importance. Teachers played a crucial role guiding discussions and reflections, helping children develop a respectful, reciprocal relationship with soil. Children were also encouraged to animate soil and its inhabitants in their stories and drawings, creating characters and narratives that brought soil to life, imagining its thoughts, feelings and interactions with other elements.

Soil pedagogies

The study asked teachers to employ various pedagogical approaches supporting children's animistic view of soil and to facilitate experiences and discussions offering the possibility for children to position soil as living and dynamic. Imaginative exploration and animation of soil and its inhabitants were encouraged through activities prompting children to create stories and drawings depicting soil organisms as characters with personalities and roles. During soil explorations, teachers posed open-ended questions like, "What is Earthworm doing with Soil?" or, "How does Soil help Orange Tree grow?" These questions, employing a grammar of animacy (Kimmerer, 2017), aimed to encourage children to consider the roles and relationships of soil organisms and reinforce the idea of soil as a lively, interconnected system.

Soil engagements

Sensory engagements with soil were a key aspect of this project, crucial for shaping children's perceptions and understanding. Touching, listening to and observing soil invited children to connect with it on multiple levels.

Touching

Children gather around a patch of school garden soil, their faces a mix of curiosity and uncertainty. Teacher Jeanne encourages them to explore with their hands. Some hesitate, fingers hovering, while others dive right in, eagerly sifting. "It feels cool and soft," Vivi remarks.

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Figure 1. Sifting soil through fingers.

"I do not want to touch it," Jack says, pulling his hand back. "Me either!" says someone else. "That's okay," Jeanne reassures, "you can watch what others find."

As children dig, they uncover small creatures. "A worm!" Ella exclaims, holding it up, giggling as it wriggles. Kai finds a small beetle and carefully places it on his palm. "It's tickling!" he squeals.

"Look, tiny red things!" Indira exclaims, pointing to scurrying mites. "Hey! There's spiderwebs here!" says Logan, referring to fine fungi strands. Teacher Jeanne explains, "Those are fungi, they help connect plants and soil, just like a web." Someone else notices a small root and gently tugs at it, revealing a network beneath. "Here's another web," she says, tracing the roots with her fingers.

"Soil is a big home for all these creatures," Alice says. "We need to be careful!." As children handle the soil, they realise it is not inert. "Stop digging!" Logan says suddenly, concerned. "We're destroying their home!" The other children solemnly nod and carefully pat the soil back into place.

The physical act of touching soil offered children a sensory connection; however, many participants, including teachers, initially hesitated to touch soil with bare hands, reflecting a view of soil as dirty or undesirable. When the study commenced, very few children in Jeanne's 5–8-year-old group (featured in the vignette above) would directly touch soil, some even vocalising disgust. Younger children at other sites were more likely to engage; one teacher noted that babies at her site were very keen to touch soil, yet her group of four-year-olds hesitated. Discussion with teachers led them to speculate that by age four, children have learned to avoid touching soil.

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Figure 2. Caressing soil in situ.

Researchers also noticed teachers providing items like shovels, garden trowels, sticks, gloves and spoons, or placing soil in transparent containers, allowing investigation without direct contact. When this was brought to teachers' attention, they revealed worries about "germs" and "getting dirty." One admitted being "a bit dirt phobic,"—others agreed. Teachers decided a handwashing regime would alleviate concerns, after which children and teachers became more comfortable with direct soil contact, and initial reluctance gradually eased (Figures 1, 2, 3).

Coming to know soil only through vision or vicarious experiences has limitations. As Maria Puig de la Bellacasa (2017, 97) notes, "To think with touch has a potential to inspire a sense of connectedness that can further problematize abstractions and disengagements of (epistemological) distances – between subjects and objects, knowledge and the world, affects and facts, politics and science." By haptically interacting with soil, children form a more intimate and meaningful connection.

Our project's emphasis on touch draws on a broader theoretical framework highlighting the embodied, relational and engaged nature of knowledge (Barad, 2007; Haraway, 1991). Touching soil allowed children to directly experience its materiality. This situated, embodied learning contrasts with the detached vision often dominant in modern knowledge-making practices (Puig de la Bellacasa, 2017). Engaging with soil through touch enabled children to blur self/other and subject/object boundaries, cultivating a co-transformative connection.

The concept of "intra-action," originally theorised by Karen Barad (2007), is central to understanding the relational dynamics of touching soil, as discussed by Puig de la Bellacasa (2017). For Barad (2012b), touch is not a simple interaction between separate entities but an intra-active process where entities emerge through their entangled relations. This means touching and being touched are co-constitutive processes, highlighting mutual influence and shared

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Figure 3. Cautiously touching soil.

vulnerability. This is crucial for understanding the ethical implications of touch, as it involves responsibility to be attentive to the needs and desires of others, human and more-than-human. Knowing is not about representing the world from a distance but being materially entangled with it, actively participating in its ongoing creation (Barad, 2012b). For children, touching soil is not merely observing it as an external object but attuning to its material aliveness and becoming part of its dynamic processes. This experiential engagement aligns with principles of animism, where entities are perceived as alive and active participants in the world.

Listening

Jeanne (teacher) tells children she has read about a scientist recording soil sounds. The 5–8-year-olds gather around a tub of soil Jeanne brought into the classroom, their faces a mix of curiosity, scepticism, and uncertainty. Silas leans in, placing his ear close to the soil (Figure 4). *Eyes wide, he exclaims, "I can hear the worms moving!" One by one, children kneel, pressing their ears near the soil, listening intently. Murmurs of excitement confirm soil sounds. Tentatively, some dig with fingers, searching for the source. An earthworm is found! Kai carefully lifts it to his ear, hoping to hear more* (Figure 5). *"I cannot hear anything," he says, disappointed. "Maybe it went quiet because it got scared," Alice suggests. Kai returns the worm to the tub. Then Seb speaks, "It is their home – we need to put the soil back where it came from." Everyone agrees. The children carry the tub outside, gently returning the soil to its original spot under the orange tree.*

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Figure 4. Listening to soil.

Children (3–4-year-olds) [at another site] *are in the sandpit, playfully chatting and singing to the sand. "Can sand hear?" asks Mia. She seems dubious.*
A vigorous debate ensues.
Clarita, their teacher, holds up her phone and suggests, "What if we use my phone to see if the sand hears anything?" She shows them how the phone records and plays back their voices and other sounds.
The children and Clarita dig a hole about 30 cm deep in the sandpit. They place the phone, sealed in a plastic bag, into the hole and set it to record. They bury it and after 15 minutes, dig it up. Everyone gathers around to listen to the recording. Faces light up as the sounds of digging, rustling sand, and their own muffled voices are played back. The children are very excited that their voices can be heard underground.
"Sand DOES hear!"
"It hears our songs!"

Soil is not commonly thought of as a sonic environment; indeed, it is typically perceived as silent and inert. While we are not certain Jeanne's group actually heard soil sounds, the act of listening clearly sparked a newfound appreciation for the previously hidden world beneath. Moreover, Clarita's group discovered human voices and activities could be recorded using a buried phone, revealed soil not just as a passive medium but an active environmental participant. The seemingly minor gesture (Manning, 2016) of listening to soil became a way to engage with it as animate—as capable of perceiving and interacting with the world above.

Many children's expressions reflect a grammar of animacy in action. While these utterances may appear anthropomorphic, they can also be understood as part of a broader relational

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Figure 5. Listening to soil.

orientation where non-human entities are perceived as responsive and agentic. Rather than viewing anthropomorphism as a limitation, we follow Barad (2012a, 27), who advocates for "'anthropomorphizing' as an intervention for shaking loose the crusty toxic scales of anthropocentricism, where the human in its exceptional way of being gets to hold all the 'goodies' like agency, intentionality, rationality, feeling, pain, empathy, language, consciousness, imagination and much more." In this sense, anthropomorphism can be seen as a subset of animist thinking, enabling children to express ethical and affective connections with the more-than-human world through imaginative language and embodied engagement.

Noticing

Inspired by Aviva Reed's work, teachers invited children to create soil "portraits," depicting imagined and observed understandings and connections to soil in creative, personal ways. Through drawing and painting, these portraits illustrated children's perceptions of soil as lively and animate. For example, Riaz's portrait showed a cross-section of soil with various interacting organisms, such as worms, bacteria and water (Figure 6).

Another portrait by Vivi portrayed soil as a playground for creatures like ants and worms (Figure 7). The soil is shown with tunnels and chambers, resembling a fun, adventurous environment, highlighting Vivi's view of soil as lively and interactive. Vivi narrated this description of her drawing:

> *There was a soil playground! The ants had races through the tunnels – so fast! They slid down dirt slides and went wheee! They hid in little rooms and everyone had to find them. Soil was so happy.*

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Figure 6. Soil portrait by Riaz.

Figure 7. Soil portrait by Vivi.

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Figure 8. Collaborative soil portrait mural.

Figure 9. Using a microscope to encounter soil.

Inspired by their soil discoveries and illustrations in *Nema and the Xenos* (Wild et al., 2019) and *Exploring Soils* (Grover & Heisler, 2017), a group of 4-year-olds created a large collaborative soil portrait mural illustrating soil's bio-liveliness (Figure 8). This creation process generated conversations. For example, children speculated soil critters would die under buildings due to compaction and lack of plants. Many conversations used a grammar of animacy; Leo lamented, "Soil is sad without plants," and Willa agreed, "Roots and soil is under the concrete. They would get sad and nervous if they had concrete on them."

At two sites, children used microscopes to observe soil microorganisms such as bacteria, fungi and tiny invertebrates (Figure 9). Teachers guided children in identifying these organisms and discussing their roles in the soil ecosystem. This helped children to appreciate the unseen life within soil, furthering their wonder and respect for the intricate web of life soil supports. These moments of noticing suggest a shift from passive observation to relational engagement, where children perceive soil as a lively and interconnected system rather than a static background (Figures 10, 11).

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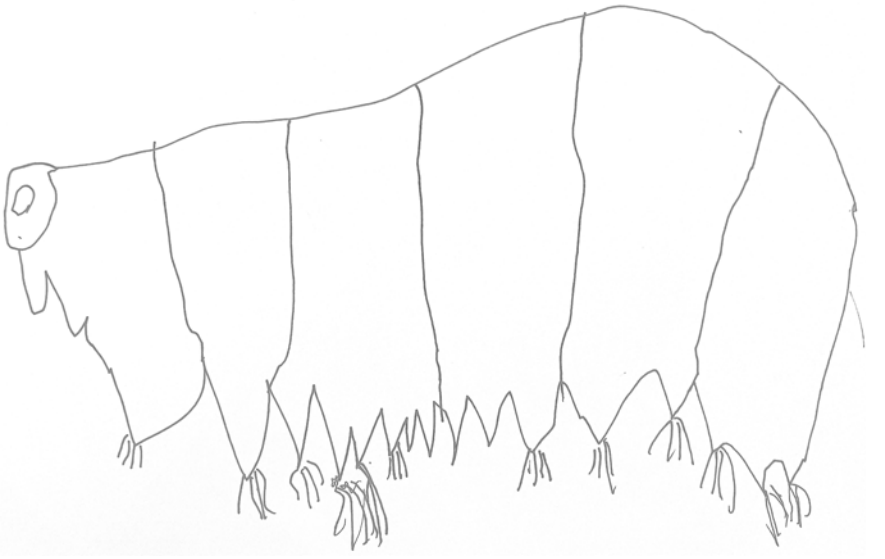

Figure 10. Soil critter portrait.

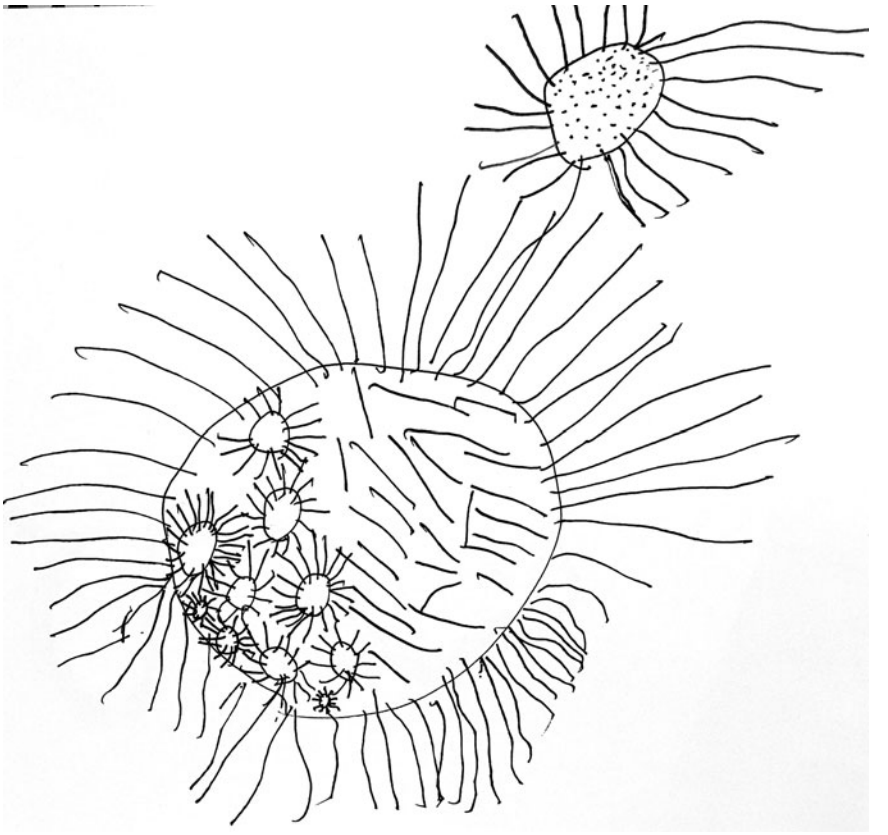

Figure 11. Soil critter portrait.

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Observing soil microorganisms through microscopes offered children a tangible way to perceive soil's liveliness. These encounters deepened their understanding of soil as a multispecies world and reinforced the idea that even the smallest things are part of a larger ecological web. Such moments of noticing reflect children's growing ecological sensitivity and support the notion of intra-action (Barad, 2007), where knowledge emerges through entangled more-than-human relations.

Storying

The educative potential of storytelling for environmental education has long been recognised (Lutts, 1985; van Dooren & Rose, 2012). Indeed, as Indigenous scholars remind us, story has been a central means of sharing collective knowledge and law for millennia (Kwaymullina, 2020; Poelina et al., 2022; Yunkaporta, 2019). Scholars in environmental education have also advocated for lively (Blaise, Hamm & Iorio 2017), polyphonic (Molloy Murphy, 2024), and granular (Osgood & Odegard, 2022) storying approaches that reveal the vital agencies of more-than-human worlds. Recent scholarship further emphasises Indigenous cultural narratives and ecological knowledge as co-teachers in early childhood education, particularly in place-based and sensory-rich learning environments (Acharibasam & McVittie, 2023; Somerville et al., 2023; Wilks et al., 2025). These works highlight how collective storying, learning on Country and relational engagements with more-than-human worlds nurture ecological awareness, cultural respect and a sense of responsibility in children.

Encouraged by some of this work, one teacher invited the 5-8-year-old class to tell a short story with soil as the protagonist—an invitation children enthusiastically accepted. Their lively stories (Blaise et al., 2017) featured soil characters with distinct personalities and roles. For instance, one child imagined a soil named Sandy, who comforted a frightened seed and helped it grow into a tall tree:

> *One day, a seed told Sandy it wanted to be a tree, but it was scared of rain. Don't worry, Sandy said. I'll keep you safe. So rain came, the sun shone, and the little seed grew roots and turned into a tall tree, and they were all best friends forever.* Dominic

Another story depicted Clay – a clay soil – as art, highlighting soil's connection to human creativity:

> *Some kids squished Clay into shapes. They made a bird, a sun, and a tower. I'm art now! said Clay and the kids laughed.* Ella

Similarly, Dusty, a dry and barren soil, found new life and purpose by helping a seed grow, suggesting the importance of collaboration in ecological restoration:

> *Dusty, the dry soil, felt sad 'cos nothing could grow on it. One day, the wind brought a seed. "Will you help me?" it asked. Dusty caught every bit of rain it could find and kept the seed snug. Slowly, a plant grew, and Dusty felt alive again.* Adrian

Another child created a story about Soil, who wanted to travel but couldn't until a bird picked it up. When the bird landed, Soil found itself on a new hill, where it helped wildflowers grow, illustrating soil's mobility and role in supporting life across diverse landscapes:

> *Soil wanted to travel. A bird landed on Soil's surface and picked up a tiny speck. "Hold on tight!" the bird chirped, flying far away. When it landed, Soil was on a new hill and helped the flowers grow there.* Isla

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These stories illustrate how children's imaginative expressions reflect a grammar of animacy and relational thinking. By positioning soil as a protagonist with feelings, intentions, and relationships, children demonstrated empathy and attunement to the more-than-human world. Their narratives suggest a shift from viewing soil as inert to recognising it as a living participant in ecological relations – an orientation that aligns with animist ontologies and relational pedagogies.

Bringing together touching, listening, noticing and storying

Throughout this project, the interconnected modes of touching, listening, noticing and storying cultivated children's animated soil relations. These sensory engagements allowed children to experience soil as a dynamic, living entity.

Touching soil enabled children to form a tactile relationship with it, breaking down discomfort and unfamiliarity. Listening, whether through direct auditory experiences or imaginative storytelling, opened new ways of perceiving soil as an active environmental participant. Noticing soil through detailed observations and creative expressions, like soil portraits, helped children appreciate the intricate web of life within. Storying, where children created narratives with soil as protagonist, allowed them to articulate its vital ecosystem role.

These modes are interconnected, each reinforcing the others. For example, touching soil can lead to noticing its textures and inhabitants, inspiring stories and prompting listening to its sounds. By integrating these sensory engagements, the project demonstrated how animistic approaches can transform children's soil perceptions, encouraging them to see it as a lively, agential part of their world. This pedagogical transformation enhances ecological awareness and nourishes environmental connectedness. These interconnected engagements reflect children's attunement to soil as a relational, responsive presence. By weaving theory into the vignettes, we aimed to show how children's expressions—whether through touch, observation, or story—embody animist and relational understandings of the more-than-human world.

Conclusion

The *Soil Biome Immersion* (Reed, 2022) ended with the words, "I am you," referring to humans being constituted from the same elements as soil. Presenting soil as lively, animated and agential was a mode of encounter that unsettled conventional framings that prioritise separation. By positioning soil as an active participant, children and teachers were encouraged to see themselves as *part of*, not *apart from* soil and its myriad inhabitants. This shift upset conventional notions of soil as inert, making room for a dynamic, vibrant understanding of soil ecosystems. Our research suggests animism supports new child-soil relations grounded in curiosity, empathy and respect, rather than rejection and disgust.

These findings have practical implications for teacher education and curriculum design. By integrating animist perspectives and sensory pedagogies, teachers can foster ecological awareness and relational thinking in early childhood settings. Professional learning experiences, such as the *Soil Biome Immersion*, can support teachers in reimagining soil not as inert matter but as a lively co-teacher, enriching both environmental education and broader pedagogical practice.

Seeing soil as a living, dynamic entity can cultivate a sense of responsibility and care. This relational understanding extends beyond soil to encompass broader ecological relations, promoting a holistic view of worldly interconnectedness. As Rousell (2023, 1) notes, "Children's animistic understandings of multispecies relations can inform responses to climate change which are sensitive to the intricate dependency relations that sustain life." Thus, animism offers a potentially powerful possibility for reimagining child-soil relations and more profound ecological consciousness. Embracing animist perspectives can help children develop a richer, more empathetic understanding of the world, ultimately contributing to more harmonious worldly relations.

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