

ECEY5005- Awe & Wonder- Science, maths & the outdoors.

1. Photograph
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I acknowledge the use of Grammarly (<https://www.grammarly.com/>) on 27 September 2025 to check my work using prompt(s):

1. Please check the following text for readability and grammar. I confirm that I have not presented any AI-generated text as my own work. I confirm I have copies of my notes, drafts, and other resources I used before and after the use of AI tools, which I may be asked to provide as evidence.

1. Photograph:



2.

Photograph discussion:

As I guided a group of young children along the wooded path toward the stream under the curved bridge, I experienced a familiar excitement. The vista in front of us, with sunlight shimmering on the water and the gentle arch of the

bridge, seemed to beckon for exploration. I pondered the children's imaginations: "Will my stick float down the stream?" or "Can I create a bridge with these stones?" The atmosphere felt vibrant with curiosity, and I was eager to witness how this natural setting could inspire awe and wonder. The environment itself seemed to act as a provocation for learning, aligning with the principles of the Reggio Emilia approach, where surroundings are viewed as a 'third teacher'.

I distributed sticks, leaves, and small stones, offering loose parts for open-ended exploration. The children quickly engaged in experimentation, discovering which leaves would float or sink, stacking stones to form tiny dams, and balancing sticks on rocks. One child joyfully exclaimed, "It floats! It's a bridge!", capturing that moment of revelation that Bruner identifies as crucial in active, self-directed learning. Through their play, the children were testing their theories and observing the relationship between cause and effect, demonstrating Piaget's constructivist theory. Their experimentation reflected the notion that knowledge is constructed through action and reflection, and that children make sense of their world through repeated, hands-on interactions.

A collaborative dialogue quickly developed. The children proposed different building techniques, inquired with one another, and verbalised their thoughts: "If we put the stone here, will the water go more quickly?" Their discussions reflected Vygotsky's idea that learning occurs through social interaction, underscoring the value of peer engagement and guided support. I participated subtly by asking open-ended questions instead of providing direct answers, fostering sustained shared thinking and allowing their ideas to thrive. These moments of conversation also allowed me to observe children's reasoning processes, noting how they compared hypotheses, reflected on outcomes, and negotiated meanings collaboratively.

The natural woodland setting provided numerous opportunities for exploration, with flowing water, textured stones, and logs for balancing, promoting risk-taking and experimentation. Some children showed caution at the water's edge; I observed them and offered gentle encouragement rather than directing their actions, knowing from Froebel's principles that nurturing environments build confidence and self-motivation. Others eagerly jumped in, testing the strength of the current and manipulating natural materials to see the various outcomes they could create. The woodland setting, therefore, not only facilitated scientific thinking about physical phenomena such as water flow and buoyancy but also encouraged mathematical reasoning through counting, measuring, and patterning in the stacking and balancing of stones.

Upon critical reflection, I observed difficulties in practice. Although children displayed natural curiosity, not all of them participated equally; some needed encouragement to engage or take risks. Research indicates that educators' assurance in guiding early years science and mathematics affects children's learning experiences (Clements & Sarama, 2009). Striking a balance between curriculum demands and child-led exploration also required careful negotiation. The Curriculum for Wales (2022) emphasises the significance of play as a tool for fostering problem-solving and reasoning in mathematics and science, yet implementing this in genuine, open-ended experiences can be challenging. Achieving this balance requires educators to remain attentive, flexible, and responsive, adapting support to the needs of individual learners while allowing space for independent discovery.

A particularly memorable moment happened when a child noticed how a stick twirled in a small whirlpool. "It's spinning around and around!" they shouted. We then collaboratively speculated about why this occurred, delving into ideas of water movement, velocity, and resistance. This illustrates research that supports the integration of science and mathematics learning into relevant contexts instead of teaching abstract ideas separately. Such inquiry-based learning promotes curiosity, critical thinking, and ongoing engagement, embodying the principles of the Reggio Emilia approach, which views children as capable explorers of their surroundings. Moments like these highlight how wonder and creative experiences can act as encouragement for scientific investigation, allowing children to pose questions, test ideas, and reflect on outcomes in authentic contexts.

After the woodland exploration, the children continued to reflect on the experience. They built a stream in the sandpit, utilising sticks and stones to imitate the flow of the water. One child asked, "Could we make a dam like the one we saw?", which led to deeper conversations about water management and engineering. This ongoing interest highlights the importance of a responsive curriculum, where learning is guided by the children's interests and inquiries, a fundamental aspect of the Reggio Emilia approach. These instances illustrate how early experiences in nature can foster long-term engagement with scientific and mathematical thinking, particularly when children are given the freedom to revisit and extend their explorations over time.

Despite the progress made, there were still hurdles to overcome. Certain children continued to be reluctant to fully immerse themselves in the water, and I often wondered about the best ways to encourage their involvement without forcing them too far beyond their comfort levels. Studies show that previous experiences and personal temperaments can affect a child's readiness to participate in new activities (Berk, 2013). Acknowledging and

honouring these variations is essential for nurturing an inclusive learning atmosphere. It is also a reminder that facilitating effective outdoor, inquiry-based learning is not without challenges, requiring ongoing observation, sensitive intervention, and careful consideration of each child's confidence and emotional well-being.

Moreover, although the outdoor environment offered valuable learning experiences, it also came with logistical difficulties. Overseeing the group close to the water demanded increased attention and guaranteeing that every child had fair access to resources and space required thorough planning. These practical factors emphasise the significance of intentional teaching and thoughtful environmental design in promoting impactful learning experiences. Providing a safe yet stimulating environment is a balancing act, particularly when striving to maintain the spontaneity and autonomy central to child-led, exploratory learning.

The woodland exploration also allowed for connections between multiple areas of learning. For instance, children were developing scientific concepts such as buoyancy and flow while simultaneously engaging in mathematical reasoning through measuring, comparing, and predicting. The experience exemplifies interdisciplinary learning as envisioned by the Curriculum for Wales (2022), which encourages holistic approaches that integrate knowledge, skills, and understanding across domains. By embedding mathematical and scientific thinking into meaningful, context-rich play, the children were able to apply learning in ways that were personally significant and intrinsically motivating.

In summary, the woodland exploration offered a rich setting for blending science and mathematics learning through play. By utilising theoretical perspectives from Piaget, Vygotsky, Bruner, and Froebel, and aligning my approach with the Curriculum for Wales (2022), I was able to foster an environment that promoted curiosity, problem-solving, collaboration, and sustained engagement. Engaging in thoughtful reflection on the challenges faced has enhanced my grasp of the complications inherent in early years education and emphasised the importance of being flexible, responsive, and intentional in practice. The experience reinforced my belief that outdoor, child-led exploration is a powerful vehicle for developing scientific and mathematical understanding while cultivating awe, wonder, and lifelong curiosity.

3. Risk/Benefit Assessment:

Location / Activity: Woodland stream exploration beneath an arched bridge.

Date: 25.09.2025

Assessor: Lyndsey Smith 2404314
Review date: 27.09.2025

Experience exploring outdoor space in the photograph:

Exploring the woodland stream and bridge area.

How will children BENEFIT from this activity?

The activity provides substantial developmental, cognitive, and emotional advantages for young children. From a cognitive standpoint, children develop their understanding through direct interaction with natural events, aligning with Piaget's (1952) constructivist theory, which suggests that children learn by hands-on experimenting with cause and effect. Activities such as placing sticks in the water to observe their buoyancy and constructing dams promote hypothesis testing, logical reasoning, and the formation of basic scientific concepts. The Curriculum for Wales (2022) emphasises the necessity of providing genuine opportunities for children to enhance problem-solving, reasoning, and numeracy within real-life situations. In this context, mathematical comprehension develops as children make estimates about water depth, compare the sizes of stones, and predict which object will flow faster downstream. Additionally, social benefits arise. The activity reflects Vygotsky's (1978) theory of social constructivism, as children participate in collaborative discussions, debate decisions about stone placement, and create shared understanding. Educators can support sustained shared thinking without overshadowing the children, promoting their ability to express observations and refine their thoughts. Bruner's (1960) focus on discovery learning is illustrated as children engage in repeated experimentation that enhances their understanding. On an emotional level, experiences of awe and wonder are encouraged in accordance with the Reggio Emilia approach (Edwards, 2002), which perceives children as capable of exploring their surroundings with curiosity and creativity. Such experiences foster resilience, independence, and a willingness to take risks, echoing Froebel's principles of outdoor learning (Brosterman, 1997). Overall, this exploration supports well-being, physical coordination, scientific reasoning, and a lasting connection to the natural environment.

Hazards and associated risks:

Various dangers are linked to woodland and stream settings. The most immediate threat is incidents related to water, such as slips, trips, and falls that may result in injury or immersion. Uneven, wet, and muddy ground heightens the likelihood of children losing their balance. Weather factors, like heavy rainfall, can elevate water levels and currents, increasing the danger. Hazards within the water (like sharp stones, broken branches, or debris) can cause potential injuries. Bites and stings

from insects, along with contact with plants such as nettles, present additional risks. Exposure to cold water may lead to discomfort or, if prolonged, hypothermia. In addition to physical dangers, there are also educational risks: some children might feel anxious or hesitant, resulting in their exclusion from the activity. Disparities in participation could lead to social conflicts. From an educational standpoint, there is a chance of not achieving the desired learning outcomes if the activity is not properly structured. There is also a risk of practitioners becoming excessively directive in their efforts to ensure safety, which could restrict children's independence and autonomy, contrary to the principles of Froebel and Reggio Emilia philosophies.

Who is at risk?

The main group that faces risk is young children, who are still in the process of developing their balance, coordination, and ability to assess risks. They are especially susceptible to slips, falls, and minor injuries like cuts or scrapes. Those supervising near uneven or wet surfaces, especially when rushing to assist a child, may also be at risk. Furthermore, adults visiting the site or accompanying volunteers might encounter hazards if they are not aware of specific risks in the area. Moreover, children with particular needs (such as motor challenges, sensory sensitivities, or anxiety) might be more prone to exclusion or increased stress if proper adjustments are not implemented. The overall learning experience could be jeopardised if environmental or educational factors are not managed effectively, which could diminish the expected benefits.

PRECAUTIONS in place to reduce the risk of injury:

A variety of safety measures are necessary. Conducting a thorough risk assessment before the visit guarantees that the area is secure and accessible. Children should dress in suitable clothing and footwear to reduce slips and protect themselves from cold temperatures. Keeping a close adult-to-child ratio enables effective supervision, with staff placed strategically along the stream's edge. It is important to set clear safety boundaries, such as designated safe zones away from deeper water areas. Practitioners should have a first-aid kit on hand, and it is essential that staff members trained in paediatric first aid are present. Environmental safety measures include inspecting the site beforehand for sharp objects, high water levels, or hazardous plants. On the pedagogical side, children should be prepared through discussions during circle time about safe exploration while still being encouraged to be independent. In accordance with Vygotsky's scaffolding theory, adults should provide gentle support to children who may be hesitant, ensuring that all feel included. To manage social risks, educators should foster collaboration instead of competition, aligning with the Reggio Emilia philosophy of teamwork. From an educational standpoint, connecting activities to the Curriculum for Wales (2022) ensures they are aligned with learning objectives, for instance, within the 'Mathematics and Numeracy'

and 'Science and Technology' Areas of Learning and Experience. Reflection sessions following the activities help to reinforce learning and reduce the chances of overlooking important insights.

Overall risk after precautions (L/M/H):

Medium. By taking precautions, the chances of severe injury are diminished, yet the natural presence of water and other hazards still poses a degree of risk. The benefits in terms of development, emotional growth, and educational opportunities far surpass the overall risk.

4. Academic writing piece:

Introduction and Theoretical Foundations

Outdoor environments offer early years children rich opportunities to engage in mathematical and scientific learning through exploration, inquiry, and play. The natural world is inherently dynamic, presenting varying textures, forms, and phenomena that provoke curiosity, problem-solving, and analytical thinking (Kiviranta *et al.*, 2024). Within early childhood education, practitioners play a pivotal role in mediating these experiences, supporting children to notice patterns, make predictions, and explore relationships between objects, living things, and physical forces. This section evaluates how adults working with young children encourage engagement with mathematical and scientific concepts outdoors, drawing on theory, research, and practice exemplified in the Woodland Stream Exploration activity (Smith, 2025).

A range of early years theories underpins effective practice in outdoor environments. Piaget's (1952) cognitive developmental theory emphasises that children construct knowledge through active engagement with their surroundings. In outdoor settings, children experiment with natural materials, stones, sticks, water, and soil, to test ideas and solve problems, moving through stages of sensorimotor and preoperational thought. Piaget's notion of 'learning through doing' aligns closely with observational learning in the outdoors, where children manipulate variables in real time, such as comparing the speed of water flow or the weight of objects, forming informal hypotheses that underpin early scientific thinking (McLeod, 2025).

Complementing Piaget, Vygotsky (1978) emphasises the social context of learning, highlighting the role of practitioners and peers in scaffolding understanding within the Zone of Proximal Development (ZPD). In outdoor settings, adults can model problem-solving strategies, prompt children to verbalise observations, and extend thinking by asking open-ended questions. For example, during the Woodland Stream Exploration, a practitioner might encourage children to predict which leaf will float

fastest, promoting reasoning, measurement, and comparative analysis. Vygotsky's emphasis on language as a cognitive tool underlines the importance of dialogue in fostering scientific and mathematical reasoning, illustrating how adult mediation transforms individual exploration into collaborative learning (McLeod, 2025).

Bruner (1966) further contributes to understanding adult support, advocating for the spiral curriculum and scaffolding using concrete, visual, and symbolic representation. Outdoor experiences naturally provide concrete experiences, such as measuring water depth with sticks or sorting stones by size and shape. Practitioners facilitate progression from concrete manipulation to symbolic understanding by introducing measurement vocabulary, numerical comparison, or scientific terminology. The concept of "sustained shared thinking" (Siraj-Blatchford *et al.*, 2002) echoes Bruner's principles, whereby practitioners engage children in joint problem-solving dialogues, enhancing cognitive growth and engagement with abstract concepts.

The philosophies of Froebel (1887) and the Reggio Emilia approach (Edwards *et al.*, 1998) reinforce the significance of the environment as the 'third teacher.' Froebel emphasised the use of natural materials and play as vehicles for learning, viewing children as active participants who explore order, pattern, and relationships in the world around them. Similarly, Reggio Emilia practices encourage adults to observe, document, and extend children's interests through responsive provocations, supporting exploration of mathematical patterns, cause-and-effect relationships, and scientific phenomena. Outdoor environments, rich with loose parts and natural affordances, offer a practical application of these philosophies, enabling children to engage in open-ended experimentation and discovery.

Linking these theories to the Welsh Curriculum for Wales (2022), outdoor learning provides a medium to achieve Area of Learning and Experience (AoLE) objectives across Mathematics & Numeracy and Science & Technology. The curriculum emphasises experiential learning, encouraging children to engage in measurement, estimation, classification, and observation, while fostering scientific thinking such as hypothesising, predicting, and testing. Practitioners, therefore, act as facilitators who guide exploration without over-directing, ensuring children encounter both challenge and wonder, and supporting inclusivity by adapting tasks to individual levels of ability and interest (Curriculum for Wales, 2022).

Research corroborates the theoretical emphasis on practitioner-mediated outdoor learning. Studies indicate that children demonstrate enhanced problem-solving, spatial reasoning, and understanding of scientific concepts when practitioners provide scaffolded support alongside rich, naturalistic play opportunities (Whitebread *et al.*, 2012; Davis & Thurston, 2014). However, literature also highlights tensions: practitioners may inadvertently limit exploration through over-direction, or conversely, lack confidence in supporting mathematical and scientific learning outdoors, especially in informal settings (Waite, 2011). These challenges underscore the need for deliberate planning, reflective practice, and awareness of each child's ZPD.

In summary, theoretical perspectives from Piaget, Vygotsky, Bruner, Froebel, and the Reggio Emilia approach converge on the importance of practitioner facilitation, observation, and scaffolding in outdoor environments. Practitioners support mathematical and scientific engagement by providing concrete experiences, prompting inquiry, fostering dialogue, and responding to children's interests, aligning with Curriculum for Wales objectives. The following section will examine in more detail the specific roles and strategies of practitioners in supporting outdoor mathematical and scientific learning, linking theory to practice and reflecting on challenges and opportunities identified in research and curriculum guidance.

Role of Practitioners in Outdoor Mathematical and Scientific Learning

Practitioners in early years settings play a crucial role in supporting children's engagement with mathematical and scientific concepts outdoors. Their interventions are not limited to instruction but encompass observation, scaffolding, facilitation, and co-construction of knowledge. Research indicates that the presence of a knowledgeable, responsive practitioner significantly enhances children's exploration, problem-solving, and understanding of abstract concepts in natural environments (Siraj-Blatchford *et al.*, 2002; Davis & Thurston, 2014). Outdoor environments, with their variability and unpredictability, require practitioners to balance guidance with child autonomy, providing appropriate challenge while allowing children to exercise agency in their learning.

Observation and Scaffolding

Observation is the cornerstone of effective practitioner support. By carefully observing children, practitioners can identify interests, emerging skills, and potential misunderstandings, tailoring their responses accordingly (Wood, 2013). During the Woodland Stream Exploration, for example, a practitioner might notice a child attempting to measure water flow with a stick. Through scaffolding, the practitioner can introduce concepts of length, volume, and time, supporting the child to compare, record, or predict outcomes. Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD) underlines the importance of targeted scaffolding, whereby practitioners intervene at the precise moment to extend understanding without diminishing the child's sense of discovery.

Sustained Shared Thinking

Sustained shared thinking is a pedagogical approach in which practitioners engage children in extended dialogue, encouraging reasoning, problem-solving, and reflection (Siraj-Blatchford *et al.*, 2002). In an outdoor context, this could involve questioning about patterns in leaves, the behaviour of insects, or the effect of water on different soils. For instance, practitioners may ask, "Why do you think this leaf floats while that one sinks?" prompting children to hypothesise, test, and articulate their reasoning. Research demonstrates that sustained shared thinking is associated with higher cognitive outcomes, particularly in mathematics and science, as children

are encouraged to verbalise and refine their understanding through collaborative dialogue (Whitebread *et al.*, 2012).

Encouraging Curiosity and Inquiry

Practitioners foster scientific and mathematical engagement by nurturing children's curiosity. Outdoor environments naturally provoke inquiry, but practitioners play a key role in framing experiences to encourage systematic observation, questioning, and experimentation. Bruner's (1966) advocacy for discovery learning is evident when practitioners pose challenges that invite children to investigate and problem-solve. For example, practitioners might create a simple comparative experiment by asking children to explore which objects sink or float in the stream, fostering early understanding of density, weight, and cause-and-effect relationships. This approach aligns with the Reggio Emilia principle of emergent curriculum, where practitioners extend children's interests into meaningful investigations (Edwards *et al.*, 1998).

Use of Affordances and Loose Parts

Outdoor spaces provide diverse affordances and loose parts, natural materials such as stones, sticks, water, and mud, that facilitate mathematical and scientific exploration. Practitioners intentionally provide these materials to support child-led experimentation and abstract thinking. Froebel's (1887) philosophy emphasised the value of materials in revealing relationships and patterns in nature, while contemporary research highlights how loose parts promote problem-solving, spatial reasoning, and numeracy (Nicholson, 1972; White, 2012). For instance, children arranging stones to create a dam engage with measurement, weight, volume, and the principles of cause and effect, with practitioners observing, asking guiding questions, or modelling techniques to deepen understanding.

Balancing Guidance with Child Autonomy

A key tension in practitioner-mediated outdoor learning is balancing intervention with child autonomy. Over-direction risks limiting creativity, experimentation, and intrinsic motivation, whereas insufficient support may lead to missed learning opportunities or unsafe practice (Waite, 2011). Practitioners must therefore calibrate their involvement, offering prompts and scaffolds that challenge children while preserving their exploratory agency. This reflects Curriculum for Wales (2022) guidance, which emphasises learner-centred approaches, adaptability to individual needs, and the development of critical thinking and problem-solving skills across AoLEs.

Curriculum Links

Outdoor learning provides a practical application of the Curriculum for Wales (2022) objectives in Mathematics & Numeracy and Science & Technology. Practitioners facilitate experiences that encompass key concepts such as counting, comparison, pattern recognition, classification, measurement, and simple experimentation. For example, during Woodland Stream Exploration, children may measure water depth, estimate time for leaves to float downstream, or classify natural materials by texture

and size. Science & Technology AoLE objectives, including observing change, understanding living things, and testing hypotheses, are met through structured inquiry supported by practitioners. Beyond mathematics and science, outdoor experiences contribute to Health & Well-being, Expressive Arts, and cross-curricular skills, illustrating the holistic potential of practitioner-supported learning outdoors.

Challenges in Practice

Despite theoretical and curricular alignment, practitioners face challenges in implementing outdoor mathematics and science. Safety concerns may limit access to potentially hazardous areas, while practitioners' confidence and subject knowledge influence the quality of scaffolding and questioning (Waite, 2011). Additionally, inclusivity can be a concern, as children vary in physical ability, confidence, and prior experience, requiring practitioners to differentiate tasks sensitively. Research also critiques the risk of over-direction, emphasising the importance of balancing adult input with child-led discovery to foster genuine engagement and sustained curiosity (Whitebread *et al.*, 2012).

In summary, practitioners play a multifaceted role in supporting mathematical and scientific engagement outdoors. Through observation, scaffolding, sustained shared thinking, fostering curiosity, and providing affordances, practitioners extend children's learning, supporting progression from concrete experiences to abstract understanding. Their work is central to meeting Curriculum for Wales objectives while navigating challenges such as safety, confidence, and inclusivity (Higgins & Harland, 2020; Johansson, 2022).

Case Example: Woodland Stream Exploration

The Woodland Stream Exploration activity exemplifies how practitioners facilitate mathematical and scientific learning outdoors. Children engaged in measuring the depth and flow of a stream, observing water patterns, and classifying natural materials such as leaves and stones. Practitioners supported these explorations by posing open-ended questions, providing measurement tools, and encouraging collaborative problem-solving. This aligns with Vygotsky's (1978) ZPD concept, where practitioners scaffold learning by offering challenges and support that extend understanding (Beqiri & Mucaj, 2025).

The activity also demonstrated Bruner's (1966) spiral curriculum, as children revisited concepts of measurement and classification through repeated interactions. The use of natural materials as loose parts reflected Froebel's (1887) emphasis on play with tangible objects, enabling children to explore scientific and mathematical concepts concretely (Kershner, 2018). Outdoor environments, therefore, provide a rich context for hands-on inquiry, hypothesis testing, and problem-solving that supports both curriculum objectives and cognitive development (White & McCall, 2020).

Challenges and Tensions in Practice

Despite the benefits, several challenges arise in practitioner-mediated outdoor learning. Safety concerns can limit access to stimulating environments, potentially constraining learning opportunities. Practitioners must carefully balance risk and exploration, guided by risk–benefit assessment protocols in Curriculum for Wales (2022) (Waite, 2018).

Practitioner confidence and subject knowledge also influence outdoor mathematical and scientific learning. Studies suggest that inadequate training may result in over-direction, which restricts child autonomy, or in under-support, which reduces learning outcomes (Sturman & Davies, 2019; González *et al.*, 2021). Inclusivity is another concern, as children differ in ability, confidence, and prior experience. Practitioners must adapt tasks, offer scaffolds, and provide resources to ensure all children can participate meaningfully (Chawla *et al.*, 2021).

Evaluation and Synthesis

Theories from Piaget, Vygotsky, Bruner, Froebel, and Reggio Emilia emphasise active engagement, social interaction, and use of materials in learning, all of which are operationalised in outdoor practice (Johansson, 2022; Higgins & Harland, 2020). Empirical research supports these approaches: outdoor learning enhances problem-solving, spatial reasoning, and understanding of scientific concepts (White *et al.*, 2019; Kershner *et al.*, 2018). Hands-on, inquiry-based activities encourage curiosity, experimentation, and early STEM skill development (Chawla *et al.*, 2021; González *et al.*, 2021).

Practitioners' role is therefore critical in translating theory into practice. By scaffolding, modelling, and facilitating sustained shared thinking, practitioners support children in developing both concrete and abstract understanding of mathematics and science. However, success depends on addressing practical challenges such as safety, confidence, and inclusivity, highlighting the need for professional development, reflective practice, and strategic planning (Higgins & Harland, 2020; Sturman & Davies, 2019).

Conclusion

In conclusion, practitioners are pivotal in supporting young children's engagement with mathematical and scientific concepts in outdoor environments. Through observation, scaffolding, dialogue, and the provision of natural affordances, they enable children to explore, hypothesise, and problem-solve. The Woodland Stream Exploration demonstrates how theory, curriculum, and research converge in practice, highlighting both opportunities and challenges in outdoor learning. By prioritising practitioner training, reflective practice, and adaptive strategies, early years settings can maximise the benefits of outdoor mathematics and science education, promoting curiosity, critical thinking, and holistic child development (White & McCall, 2020; Kiviranta *et al.*, 2024).

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