

Awe and Wonder- Science, Mathematics and the Outdoors. (ECEY5005)

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AI statement:

I confirm that I have used Co-Pilot for proof-reading purposes only. I confirm I have copies of my drafts, notes and other resources I used before and after the use of any AI tool which I may be asked to provide in evidence.

Introduction

Nature-based environments can offer enriching opportunities for experiential learning. They can ignite children's curiosity and creativity and enhance their problem-solving abilities through direct interaction with natural elements (Trina *et al.*, 2024). Engaging with the natural world in early childhood (a critical period for cognitive and social development) can significantly influence children's future learning and interest in STEAM disciplines (Trina *et al.*, 2024). Research highlights that outdoor learning can support the development of essential skills such as negotiation risk and early scientific enquiry, particularly through hands-on exploration (Reeker and Waters, 2024).

This portfolio takes a look at the benefits and affordances of outdoor environments in promoting scientific and mathematical thinking during the early years. It includes current research, child-centred pedagogy, and curriculum guidance to highlight how nature-based settings can enrich learning through hands-on, exploratory experiences. The portfolio includes a detailed learning story, a risk assessment for a site visit and an evaluation of how adults working with young children can effectively support engagement with scientific and mathematical concepts.

Section 1: Outdoor environment – The woods



Woodland area (personal collection, 2025)

Section 2: Learning story

The area photographed represents a small section of an extensive natural woodland, accessible via a park footpath. The visit involved 12 nursery-aged children accompanied by four adults, enhancing the standard adult-to-child ratio to ensure greater safety and support. The woodland is a short walk from the nursery, requiring children to navigate residential streets and cross two relatively quiet roads. This time can be used as an opportunity to reinforce road safety awareness and spatial reasoning through counting steps, estimating distances, and identifying environmental features within the local area but conversations are often led by children's interests.

This is a regular trip, which reflects the nursery's commitment to the curriculum for funded non-maintained nursery settings' child-centred pedagogy which includes play-based learning, being outdoors, authentic and purposeful learning and the development of physical literacy (Welsh Government, 2024). It is underpinned by the four purposes of the Curriculum for Wales (2022) which aim to develop children as ambitious, capable learners; enterprising, creative contributors; ethical, informed citizens; and healthy, confident individuals (Welsh Government, 2022).

Practitioners chose to bring a small number of additional resources to support open-ended exploration and encourage use of natural loose parts. These included baskets for collecting materials, magnifying glasses for close observations and paper with chalks and crayons for mark-making and recording discoveries. These are to ensure opportunity to meet all area of learning and experiences.

During the walk to the park, one of the practitioners took the opportunity to initiate a group discussion, supporting the development of children's language and communication skills. The practitioner encouraged children to reflect on their previous visit, asking open-ended questions and allowing each child sufficient time to process and respond, ensuring promotion of literacy as part of the curriculum for funded non-maintained nursery settings cross-curricular skills (Welsh Government, 2024). Children recalled specific memories: one child mentioned the den they had built, while another remembered the purple flowers they had seen. Building on these recollections, the practitioner asked, "I wonder if the flowers are still there?" A prompt that encouraged prediction and scientific thinking. Upon arrival at the park, children noticed changes in the environment such as, acorns scattered across the ground and fallen leaves replacing the



Pinecones (personal collection, 2025)

Encyclopaedia Britannica (No date). *Autumn leaves*

bright summer flowers. These observations led to a conversation about seasonal cycles and change, with children identifying that it was no longer summer but now autumn.

To deepen the experience and understanding of seasonal cycles, the practitioner invited children to describe what they could see, feel, hear and touch, encouraging a multi-sensory exploration. Children responded with descriptions such as : “My hands feel cold,” “The sun is warm on my face,” “There are lots of leaves on the ground in different colours,” “I can hear the wind,” “Leaves are rustling,” “Twigs and acorns are falling,” and “I think I can feel the rain.” These responses demonstrated not only sensory awareness but also the use of descriptive vocabulary, comparative language, and observational skills. One child added, “And then it will be winter,” prompting the practitioner to extend the discussion: “That’s right - I wonder what the park will look like then?” Children eagerly contributed ideas, listing characteristics of winter such as “cold,” “snowing,” “ice on the trees,” and “all the leaves will be gone.” The practitioner used this teachable moment to introduce a scientific concept, explaining, “Yes, lots of trees will lose their leaves, but some won’t - these are known as evergreen trees.” This supported children’s understanding of plant biology and seasonal cycles.

Another cross-curricular skill which is included in each visit is digital competence. For this visit that included use of the nursery iPad. The children are given responsibility to take photos of their creations and experiences to add to their learning journals.



Trees (personal collection, 2025)

A separate group of children exploring the woodland, one child pointed to a tree and commented on its size. The practitioner responded, “I wonder if that’s the biggest tree, or is there a bigger one?” This led to a collaborative search for the tallest tree, followed by questions about the smallest tree and whether any were the same size. Through this activity, the practitioner modelled mathematical language and reasoning, supporting children’s strategic competence and understanding of measurement, comparison, and estimation – meeting the requirements of progression 1 for mathematic and numeracy learning area. (Welsh Government, 2024). To extend this learning, children were given baskets and encouraged to collect natural items.

They began comparing the height, length, and weight of sticks, leaves, and stones -

engaging with mathematical concepts such as size and quantity. The children counted items, sorted them and discussed which collections had more, less, or the same. These experiences supported the development of mathematical thinking in meaningful ways, aligned with the curriculum's emphasis on authentic and purposeful learning (Welsh Government, 2024).



Freepik (n.d.). Close-up of hand carrying pinecones in basket.

Later into the visit, one child spotted a squirrel darting quickly up a tree. This moment sparked excitement among the group and led the practitioner to sensitively guide the conversation, reinforcing the idea that we must be careful not to frighten or endanger wildlife and reminding the children of respecting animals and the natural environment. Supporting children's development as ethical, informed citizens, one of the four purposes of the Curriculum for Wales (Welsh Government, 2022).

Following the children's interest, the practitioner asked, "I wonder where the squirrel lives?" This open-ended question prompted a variety of imaginative responses: "In that log," "Up the top of that tree," and "With the birds." A discussion on habitats emerged, with the practitioner scaffolding scientific understanding. She did this by linking back to a previous visit when the children had built a den from branches as she explained that squirrels similarly build nests from twigs. This comparison helped children connect past experiences to new learning, supporting their ability to make links and deepen their understanding.

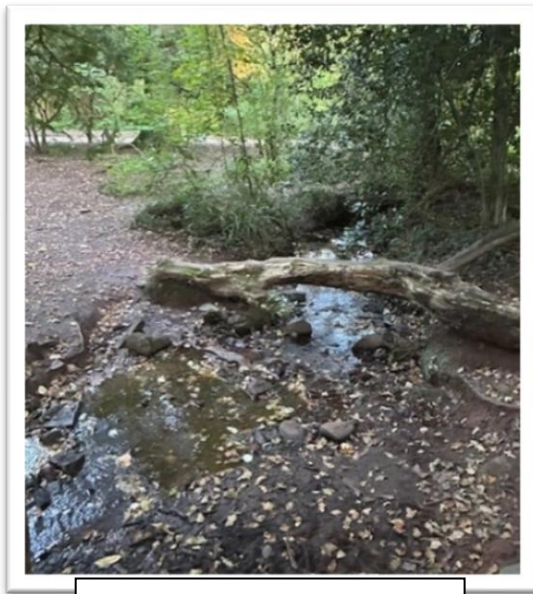
The practitioner extended the inquiry by asking, "Who else might live in the tree, on the branches, in the leaves, or around the base?" Children were offered magnifying glasses to investigate the tree and surrounding area. One child discovered a small spider, prompting further exploration of insects and small creatures. A number of children who had collected natural loose parts used these to produce habitats in preparation for the insects they would find. This hands-on investigation supported scientific learning through observation, classification, and inquiry, which are key elements of the curriculum's focus on developing ambitious, capable learners who are curious about the world around them (Welsh Government, 2022).



Pinecones (personal collection, 2025)



Loose parts (personal collection, 2025)



Log bridge (personal collection, 2025)

Later, a group of children became excited by a fallen tree that had formed a natural bridge across a shallow stream. Some children rushed to climb over it. The first child, leading the way paused and shared his knowledge “Be careful - it’s slippery!” This demonstrated not only environmental awareness but also empathy and consideration for others, showing skills towards being a healthy, confident individual, one of the four purposes of the Curriculum for Wales (2022). Through climbing up, balancing and jumping down, the children benefit from physical literacy, supporting both their vestibular and proprioception sensory system. Another group of children chose to

build their own bridge across the stream using natural materials sourced from the environment itself. This self-initiated activity provided a real-life opportunity to apply scientific and mathematical thinking. Through sustained shared thinking, the children collaborated to problem-solve, test ideas, and refine their design, developing early engineering skills, resilience and creativity as well as promoting literacy skills and social development through working together towards a common goal.

These engaging authentic, hands-on, purposeful experiences support holistic development and include all five developmental pathways outlined in the curriculum: belonging, communication, exploration, physical development, and well-being (Welsh Government, 2024) With children expressing themselves creativity through designing and planning, demonstrating teamwork, sharing and communicating ideas, assessing risks, problem-solving, exploring mathematical and scientific concepts and showing care and respect for the environment they are also demonstrating criteria from the six areas of learning and experience (Welsh Government, 2022). Before leaving the woodland, it is common practice for children to ensure the environment is return to the way we found it.

Sticks (personal collection, 2025)



Sticks in stream (personal collection, 2025)

Section 3: Risk benefit assessment

Location:	Woodland area, Parc Cefn Onn. CF14 0EP	Assessment completed by:	Kirstie Harding
Date of Visit:	21/09/2025 - 10:30am – 12:00pm	Date of Assessment:	20/09/2025

Potential hazard during outdoor experience	Who is at risk	Potential level of risk	Possible effects of hazard	Measures of control	Level of risk at control measures	Benefits of this activity
Walking to the outdoor site via residential streets	Children and adults	Low	Traffic Cyclists Road crossings, Trips/fall from uneven pavement Becomingseperated from the group	The ratio of child/adult will be 1:3 safety talk prior to leaving, Adults spaced out evenly throughout group ensuring one at the front and one at the back. Children to have walking partners. Regular head counts. Zebra crossing to be used where possible. Discussion with road safety and potential uneven surfaces. First aid kit to be taken.	Low	Visit to the site. Discovery of local area. Connections to the community. Implementing road safety skills. Physical and social development Promotes well-being.
Falls, slips and trips	Children and adults	Medium	Grazes to skin Twisted ankle Bruises/cuts Infections Broken bones Head injury	Inspections to ground and removal of loose dangerous debris where possible. Model and discuss using caution when walking over stones, uneven ground and slippery surfaces.	Low	Supporting children's vestibular sense. Children becoming aware of their own bodies. Children become aware of slopes and gradients.

				Children and adults to wear appropriate footwear and long trousers		Children learn how to manage their own risk
Stream	Children and adults	Medium	Slips, falls Twisted ankle Bruises/cuts Broken bones Potential infections Drowning Hypothermia	Remind children of water safety Discussions and demonstrate how to cross streams safely. Check depth of stream in various places on arrival.	Low	Children learn mathematic thinking skills such as measuring, estimating, quantities. Children learning scientific concepts such as cause and effects, float/sink, water flow, speed. Children gain building /engineering skill. Children are learning to manage their own risk. Promotes well-being.
Climbing	Children and adults	Medium	Broken bones Head injury Cuts, bumps, bruises to multiple parts of body	Test trees or logs before climbing. Discuss safety advice with children such as not to put weight on branches thinner than their wrist. Consider weather conditions.	Low	Children develop their gross motor skills. Supports children's vestibular and proprioception sense. Builds problem solving skills. Develops spatial awareness. Children are learning to manage their own risk. Promotes well-being.
Mud bank	Children and adults	Medium	Broken bones Cuts, bumps, bruises or grazes Head injury	Model and discuss using caution where necessary. On steep banks one adult at top one at bottom.	Low	Children learn scientific concepts such as speed, gravity. force, changes in the environment etc.

				Clear debris from bank. Consider weather conditions		Develops gross motor skills and core strength. Supports proprioception and vestibular sense. Promotes well-being.
Exposure to the elements	Children and adults	Medium	Sunburn Wind-chill, Cold Hyperthermia	Ensure everyone is in adequate clothing. Use of sun cream. Check weather reports and wind conditions. Bring spare clothing in case children get wet/cold etc.	Low	All children are warm/cool and comfortable to enjoy visit. Become aware of temperature changes and season cycles. Use of vocabulary such as hot, cold, warm etc.
Nettles or poisonous plants	Children and adults	Medium	Itchy rash	Discuss with children how to identify nettles around the site. Children to wear long trousers and gloves when handling nettles. Discuss the poisonous plants and fungi. Warn children not to eat anything or put their fingers in their mouths. Everyone to wash hands before snack and on return to nursery.	Low	Children are able to experience and explore the woodland fully. Children learn about plant biology. Children learn how to manage their own risk.
Animal or insect bite with or without an allergic reaction	Children and adults	Medium	Bite Painful itchy sting site Rash or allergic reaction Possible anaphylaxis	All staff to be informed of children's up-to-date medical records. Discuss with children to look at animals and insects but refrain from picking them up. Warn children not to eat anything or put their fingers in their mouths.	Low	Children learn how to care and respect for different wildlife and insects and their environment. Children learn how to manage their own risk.

				everyone to wash hands before snack and on return to nursery. Adult to carry antibacterial gel and wet wipes. Adults to be aware of the nearest A&E		
Rubbish, litter, broken glass	Children and adults	Medium	cut from glass or metal slip or trip on rubbish infection	Discuss the concerns around litter with children. Remove dangerous litter if safe to do so.	Low	Children learn the importance of looking after the environment and keeping it clean and litter free. Children becoming informed citizens.
Members of the public	Children and adults	Medium	Interference Verbal or physical attack	Discuss personal safety with children and what to do in the event they are approached. Explain and ensure children know the boundaries of the site. Staff to carry mobile phone in case of emergency. Higher adult to child ratio	Low	Children are given a sense of responsibility. Children are given independence and freedom to explore the area, building self-confidence. Children learn how to manage their own risk.
Getting lost	Children and adults	low	Getting lost Potential abduction	Discuss with children, the relevant actions to take if they become separated from the group. Children to remain with designated group and areas all time. Increased ratio of 1:3 Ensure one adult at the front and one at the back when moving from different spaces. Count children regularly. Staff to carry mobile phone	Low	Children are given a sense of responsibility. Children are given independence and freedom to explore the area, building self confidence . Children learn how to manage their own risk.

Special medical/dietary requirements	Children and adults	Low	Asthma attack Allergic reaction Possible anaphylaxis	Parents will have completed a medical information sheet All adults will be made aware of any dietary or medical needs of children Any adaption or adjustments are made to ensure inclusive and equal practice Necessary medications such as asthma pumps, Epi Pen to be taken in the emergency bag (check use by date prior to visit)	Low	By ensure all measures are meet and all children are included in the outdoor visits Children gain a sense of belonging and equality
Dogs	Children and adults	Low	bite from a dog Potential infection	Teach children safety awareness and the appropriate way to respond around unknown animals Ensure children know how to call for help in a calm manner if they are in trouble Leader to have a dog warden number to hand during visit	low	Children get to enjoy the park and outdoor visit Promotes well-being

Section 4:

Outdoor learning in early childhood education offers rich opportunities for mathematical and scientific thinking. When thoughtfully facilitated, outdoor environments become dynamic spaces for exploration, discovery, and creativity. Central to this approach is the concept of Loose Parts Play (LPP), which encourages children to engage with open-ended materials in imaginative and self-directed ways. This essay explores how adults can support mathematical and scientific learning outdoors, with a particular focus on Loose Parts Play and affordance and its alignment with key educational theories and curriculum frameworks in Wales.

Adults play a critical role in supporting children's engagement in outdoor learning. Richardson (n.d.), Kiviranta *et al.* (2024), and Vartiainen *et al.* (2018) all agree that adults must bring both knowledge and enthusiasm to outdoor experiences in order to inspire children's curiosity and engagement. Vartiainen *et al.* (2018) emphasises that imaginative and enjoyable outdoor activities are more likely to motivate children when adults are present and show interest. Wilding (2021) further argues that adults should not merely observe but participate meaningfully in children's play. Through active engagement and communication, adults can help children make connections between their outdoor experiences and mathematical or scientific concepts. Curriculum for Funded Non-Maintained Nursery Settings (2024) agrees adding that children need practical experiences to support early mathematical and scientific vocabulary.

One way adults can facilitate outdoor experiences to support mathematical thinking and scientific enquiry is by introducing loose parts play. The term loose parts play (LPP) refers to the use of open-ended materials, which can be either natural or manufactured and can move, arrange, and combine in countless ways. These materials -such as sticks, stones, pipes, shells, and fabric - are particularly effective in unstructured play (Cankaya, Leach & Akdemir, 2024). The open-ended nature of LPP allows children to manipulate materials according to their own ideas, fostering autonomy, problem-solving, and critical thinking, shaping children's creativity, exploration, and holistic development (Cankaya, Leach & Akdemir, 2024).

Simon Nicholson's (1971) loose parts theory suggested that children's creativity and discovery are directly linked to the quantity and variety of materials available within the learning environment. He argued that all children have a fundamental need to build, invent, and satisfy their curiosity (Cankaya, Leach & Akdemir, 2024). His theory suggests that environments rich in loose parts stimulate imaginative and inventive play. This links closely with Froebel's theory of play, which states play is the principal way children learn in the early years. He also believed that through real life experiences and outdoor learning children would be more connected with all other living things

(Cankaya, Leach & Akdemir, 2024). Loose parts play can be introduced to young babies who are at the sensory exploration stage through concepts such as treasure baskets (a collection of open-ended materials that support multisensory exploration, such as wooden spoons, soft material, brushes, cotton reels etc). This concept was introduced in the 1950 by early childhood educator Elinor Golschmied (South Australia Government, n.d.).

Natural environments such as woodlands and beaches offer particularly rich opportunities for loose parts play. Unlike manufactured play areas where adults design and control the experience, natural settings invite children to engage in spontaneous exploration and construction. Play Wales (2014) agree with Nicholson criticism of adult-designed play spaces, suggesting that they limit children's creativity compared to the freedom found in nature (Cankaya, Leach & Akdemir, 2024). Play Scotland (n.d.) supports this view, noting that natural environments provide endless possibilities for loose parts and encourage a deeper sense of connection to place and people. Access to natural loose parts encourages children to be curious about the world around them and to engage in mathematical concepts such as collecting, measuring, sorting by size or shape, and through building dens or habitats, children acquire early engineering skills and a deeper understanding of concepts like quantity, spatial awareness, and cause and effect. Materials like water, mud, and sand offer sensory-rich experiences that support experimentation and predicting outcomes, supporting children's scientific learning (Play Wales, 2014). Play Wales (2014) further highlights how natural materials such as sticks, stones, leaves, and water become tools for discovery and unlike manufacture materials that limited imagination and play, natural material extend them. When children interact with a space or object in this way, they are often perceived as affordances, a concept introduced by psychologist James J. Gibson (1979). Gibson proposed that environments and objects possess values and meanings that are unique to the individual perceiving them. The affordances of an object refer to all the potential actions it invites. A stick, for example, is never just a stick, it can become a sword, a fishing rod, a digging tool or a pointer. Its potential is defined not by its form, but by the child's imagination (Play Wales, 2014)

Both the Curriculum for Wales (2022) and the Curriculum for Funded Non-Maintained Nursery Settings (2024) strongly support outdoor learning and enquiry-based approaches. The Curriculum for Wales (2022) promotes experiential learning and emphasises the development of ambitious, capable learners who are curious about the world around them. It encourages educators to create environments that support exploration, creativity, and collaboration. Within the developmental pathways of the Curriculum for Funded Non-Maintained Nursery Settings (2024) it states that adults are to support and develop children's understanding of mathematical and

scientific concepts and language in meaningful ways. The curriculum promotes outdoor experiences as a means of exploring mathematical ideas in everyday life. By using open-ended and natural resources, adults can offer endless possibilities for mathematical exploration. Through adult support and the creation of engaging environments, children can discover and understand that mathematics is everywhere and develop strategic competence.

Despite the well-documented benefits of outdoor learning, including hands-on engagement, holistic development, and enhanced well-being, several challenges continue to limit good quality outdoor experiences. Kiviranta *et al.* (2024) identify pedagogical preconditions as a key barrier. Noting that practitioners' capabilities, confidence, and preparedness for outdoor experiences can significantly influence the quality of provision. Without adequate training and support, educators may struggle to facilitate meaningful learning in outdoor environments. Reeker and Waters (2024) further highlight that some adults may lack a full understanding of the rich learning potential that outdoor play offers, particularly in relation to subjects traditionally taught indoors, such as mathematics and science. A play-based approach to these disciplines may feel unfamiliar or undervalued, leading to missed opportunities for enquiry and exploration. Additionally, limited access to suitable outdoor space can restrict the frequency and scope of outdoor learning experiences.

Another challenge lies in adult perceptions of children's competence and risk-taking. Reeker and Waters (2024) note that some practitioners may underestimate children's abilities or feel apprehensive about the level of risk involved in outdoor play. This can result in overly cautious practices that limit children's autonomy and exploration. Concerns around health and safety have historically shaped a "culture of fear" in outdoor education, where risk is avoided rather than managed (Sisson and Lash, 2017; White, 2004). White (2014) argues that overcoming this culture requires a shift in mindset, where practitioners view the outdoors not as a hazard, but as a space where children can learn to keep themselves safe. As White (2014) states that if children are taught to recognise the risk and potential harm and knowing how to deal with it, they can learn how to keep themselves safe. Empowering children to assess and manage risk is a vital part of developing resilience, independence, and critical thinking. To address these challenges, Kiviranta *et al.* (2024) advocate for greater professional support and empowerment of practitioners. This includes targeted training, reflective practice and a shared understanding of the pedagogical value of outdoor learning. When adults are confident and well-equipped, they can create rich, responsive environments that support all areas of development, particularly in science and mathematics through child-led, exploratory play.

Conclusion

Adults working with early years children play a crucial role in supporting and encouraging engagement with mathematical and scientific concepts in outdoor environments. Through thoughtful facilitation, provision of open-ended materials and in alignment with Welsh curriculum, frameworks and pedagogical theory, practitioners can create rich, dynamic outdoor learning experiences. When adults bring enthusiasm, knowledge, and sensitivity to outdoor learning, they help children build foundational skills and develop a lifelong curiosity about the world around them.

Reference List

Cankaya, O., Leach, J. and Akdemir, K. (2024) 'The role of materials, relationships, space and time in children's loose parts play'. *The Journey of Loose Parts across Educational Landscapes and History*. 16. (2&3). Available at: <https://www.museumofplay.org/app/uploads/2024/11/AJP-16-2-3-Article-3-Loose-Parts.pdf> (Accessed: 18 September 2025).

Department of Education: Australia. *The power of loose parts play*. Available at: <https://www.education.sa.gov.au/docs/early-years/family-day-care/portal/npsa-familyday-care-loose-parts.pdf> (Accessed 25 September 2025)

Encyclopaedia Britannica (No date). *Autumn leaves*. Available at: <https://www.britannica.com/story/why-do-leaves-change-colors-in-the-fall#/media/1/2268322/334013> (Accessed: 27 September 2025).

Freepik (No date). *Close-up of hand carrying pine cones in basket*. Available at: https://img.freepik.com/premium-photo/close-up-hand-carrying-pine-cones-basket_1048944-2057778.jpg (Accessed: 27 September 2025).

Froebel Trust (2017) *Froebelian principles*. Available at: <https://www.froebel.org.uk/about-us/froebelian-principles> (Accessed: 21 September 2025).

Kiviranta, L., Lindfors, E., Rönkkö, M-J. and Luukka, E. (2024) 'Outdoor learning in early childhood education: exploring benefits and challenges.' *Educational Research*. 66(1), 102-119, DOI: 10.1080/00131881.2023.2285762

Play Scotland (No date). *Loose parts*. Available at: https://www.playscotland.org/resources/print/Play-Scotland-Loose-Parts-Leaflet.pdf?plsctl_id=10934 (Accessed: 19 September 25).

Play Wales (2017) *Resources for playing – providing loose parts to support children's play*. Available at: <https://play.wales/wp-content/uploads/2023/03/loose-parts-toolkit.pdf> (Accessed 19 September 25).

Rekers, A. and Waters, J. (2024). 'Young children's outdoor play-based learning'. *Encyclopaedia On Early Childhood Development*. Available at: <https://www.child-encyclopedia.com/pdf/expert/outdoor-play/according-experts/young-childrens-outdoor-play-based-learning> (Accessed: 20 September 2025).

Richardson, G. (No date) *Open up to outdoor mathematics*. Learning through landscapes. Available at: https://ltl.org.uk/wp-content/uploads/woocomerce_uploads/2019/05/early-years-maths-outdoors.pdf (Accessed: 25 September 2025).

Sisson, J. and Lash, M. (2017). Outdoor Learning Experiences Connecting Children to Nature. *YC Young Children*, **72**(4), pp. 8-16.

Trina, A., Monsur, M., Cosco, N., Shine, S., Loon, L. and Mastergeorge, A. (2025). 'Tool for assessing the STEAM learning affordances and quality of outdoor learning environments of childcare centres: A systematic Review'. *Early Childhood Education Journal*.
<https://doi.org/10.1007/s10643-025-01911-0>

Vartiainen, H., S. Nissinen, S. Pöllänen, and P. Vanninen. 2018. 'Teacher ´ s Insights into Connected Learning Networks: Emerging Activities and Forms of Participation.' *AERA Open* 4 (3): 1–17. <https://doi.org/10.1177/2332858418799694>.

Welsh Government (2024). *A curriculum for funded non-maintained nursery settings*. Available at: <https://hwb.gov.wales/api/storage/1f581142-6b91-41e4-845d-3d6c7765df20/a-curriculum-for-funded-non-maintained-nursery-settings.pdf> (Accessed: 25 September 2025).

Welsh Government (2022). *Curriculum for Wales*. Available at: <https://hwb.gov.wales/curriculum-for-wales> (Accessed: 21 September 2025).

White, J. 2014. *Playing and Learning Outdoors: Making Provision for High Quality Experiences in the Outdoor Environment with Children 3–7*. 2nd ed. New York: Routledge.

White, R. 2004. "Young Children's Relationship with Nature: Its Importance to Children's Development and the Earth's Future." White Hutchinson Leisure & Learning Group. www.whitehutchinson.com/children/articles/childrennature.shtml.

Wilding, K. (2021) Making early years maths meaningful: how to plan your early years maths provision. You tube. Available at: <https://youtu.be/eomkf6pmBlg> (Accessed:25 September 2025).