

ECEY5005 - Awe and wonder- Science, mathematics
and the outdoors.

Part 1



(Shanell McMullan, 2024).

Part 2

On Monday, April 1st, at 10 a.m, us practitioners and a group of children in the 4 to 5 age range prepared to head to the Abergwili Museum. It was a lovely dry day, and all the children could not wait to spend time outside in nature. According to the Welsh Assembly Government (2009), experiential learning is best done outside since it provides ample opportunity for creativity, movement, noise, and risk-taking. Therefore, the children told us they were excited to climb trees and see if they could discover any bugs as we made our way there. As soon as we arrived, the children were all thrilled to see a long tree log that they could climb on and attempt to balance while walking along. "Wow, look how big and long this tree log is," said the children, who were eager to climb on it. Therefore the children were enjoying themselves as

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they walked back and forth down the log, carefully taking turns starting at one end and moving towards the other. All practitioners were observing the children and ensuring that the children were being careful. "I wonder how you can walk across the log without slipping off?" I had questioned the children. and one child responded, "because I am balancing," while another child added, "because I have my arms out." I answered with, "Whoa! excellent work. You are all paying close attention and balancing so well". As a result the children were all having a great time balancing on the tree log. After a short while, a really fascinating question was posed by another child. The young boy had inquired about how the tree log ended up on the floor. I then asked the children if they had any ideas about how the tree log ended up on the floor. One girl stated, "The tree has fallen down because of wind and rain." I responded with, "That is a really good answer. This tree could very well have fallen due to wind or rain. Great job! Does anyone else have any thoughts that are different?" I inquired. "I think someone has chopped the tree down with big giant scissors," responded a different child. I exclaimed, "Whoa! That response is excellent and interesting. However, someone definitely could have cut down the tree, or the wind and rain could have caused it to fall. Well done!" As a result, according to the Welsh Assembly Government (2009), using the outdoors as a learning resource improves children in a variety of ways. One is that children can form a love of nature and have firsthand experience with concepts such as sustainability and conservation. Furthermore, according to the Welsh Government (2022), every child should have opportunities that foster a love of physical activity. Children's awareness of their bodies, including their gross and fine motor abilities, balance, coordination, and core strength, will be aided by these experiences.

After a while, several of the children got off the tree log and started searching around, in the cracks, and underneath it. I inquired as to what the children were seeking for. and the children said, "We're looking for bugs," in response. "Wow! That is an excellent idea. I wonder what type of bugs live here?" I asked the children. With great curiosity, the children concentrated on looking for bugs in the wood's crevices. I asked the children what kind of bugs they could locate in the gaps. The children suggested that there could be spiders, woodlouse, or caterpillars. The children were all quite intent on finding any bugs, so we brought some magnifying glasses along to aid the children in their hunt. Every child was eager to return to looking for bugs as soon as they acquired their magnifying glasses.

One young child was ecstatic to have discovered a bug. She exclaimed, "Wow, look, I found a little bug." I said, "Wow, that is really good. Although I am curious as to how many legs this little bug has." To find out how many legs the small bug had, all the children crowded around it. Some children claimed the bug had six legs, while others



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claimed it had nine or ten. In response, I said, "It is clear that the bug has numerous legs. However, I am curious what this bug's name is. Is there anyone who knows?". As a result there were several various comments to what this little bug was named, some children believed it was a centipede, while others suggested it was a woodlouse. However, one child had posed an intriguing question. The child had inquired, "Why does this woodlouse like to be in wood?" "That is a very interesting question," I replied. "I wonder if anyone knows?" Every child had a different response. While some claimed that the reason woodlouse enjoys the wood is because it is dark, others claimed that it is because it is wet and cold. 'These are all fantastic responses,' I said.

Additionally, because of this, all of the children and practitioners had fun learning about various bugs, including what they are, where they live, and even what foods they love. The children were all really interested in learning about wildlife, and most significantly, we all gained a newfound appreciation for the outdoors and the natural world. As a result, Welsh Government (2022) maintains that children learn best when they are actively involved in activities that pique their curiosity, spark their attention, and kindle their imagination.

The children noticed a mud bank with two ropes as we continued our walk around the museum. Every child was thrilled with anticipation to try out the ropes. However, before the children could try it out, we, the practitioners, had a conversation with the children and asked them to count how many ropes they could see. "One, two. There are two ropes," all the children exclaimed. In response, I said, "Fantastic! You all did an excellent job of counting. However, with only two ropes, what do you think we should do to ensure that everyone gets a turn?" "No pushing in" was the response from one child. I said, "Excellent, nicely done! As everyone wants to try the ropes, we must remember to be cautious and to take turns going up and down the ropes." As a result, all of the children were eager to climb on the ropes with practitioners observing from both the top and the bottom to guarantee the safety of every child. One child shouted, "Wow, look how fast I can slide down." "Whoa that looks super fun," I said, observing the children having a great time sliding down the mud bank. "However, I am curious if you can slide back up the mud bank?" "There is no way we can slide back up the mud," a child stated, staring at me with a confused expression. "You are correct, but why do you think that is?" I responded. Another child stated, "Because you can only slide down. To get back up, you have to climb." "Excellent responses. That is known as gravity. We can slide



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down the mud slope with the help of gravity, but we cannot slide back up," I remarked.

While the children were having a great time sliding down the mud bank and then racing back up to slide down again and again, some of the other children were having a great time playing on the ropes. Using the ropes to lift themselves up the mud bank, as well as analysing on the best way to use the ropes to come back down. As a result, Welsh Government (2022) states that outdoor activities engage children's senses through hearing, touching, seeing, and smelling. Therefore, the children had a great time playing outside in nature, learning about balance, bugs, and where they live, as well as gravity while sliding down the mud bank. However, it was time to make our way back. Everyone in the group emphasised how much of a great time they had, and even though they were sad to be going, they were also looking forward to returning to see and do even more of the things they had done on our nature walk today. On our walk back, all of the children were excitedly talking about their favourite activities they did today and what they enjoyed the most, and we practitioners highlighted how much fun we all had on our nature walk together.

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Location / Activity:	Abergwili museum nature walk	Date:	11th April, 2024.
Assessor:	Shanell McMullan	Review date:	11th October, 2024.

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and associated risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk after precautions RATING: L/M/H
Walking to the museum nature walk.	Walking can help children learn about nature and their surroundings. By keeping active. And can instruct children about safety and road safety.	Possibility of children falling or tripping. vehicles on the road. There can be obstacles on the pathways. There is the potential for animal faeces on the pavement.	Children and adults.	Explain to all the children about road safety and the dangers of cars or other vehicles. Explain to the children about the dangers of running to prevent falls or trips and to be careful. Examine the journey to ensure the destination is safe and that there are no obstacles along the way. Ensure to take a first aid kit. Ensure all children wear a high-vis for road users to visibly see the children and for the children's own safety.	Low

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Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and associated risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk after precautions RATING: L/M/H
Tree Log.	Tree logs can help young children by providing balance, climbing opportunities, and problem-solving skills. Additionally, children's imagination could also be stimulated by tree logs.	The logs from the trees might be slippery. Children might trip and tumble or get shoved. It is possible for a tree log to abruptly break. Should a child fall into the tree log, they could get splinters.	Children and adults.	Children should be warned not to push one another and should take extra care if they slip or fall. Ensure to bring a first aid kit. Ensure adequate observation in the event of a sudden breakage of the tree log.	Low.
Plants.	Children can be inspired to learn more about nature by plants. Children can learn about the plant life cycle with the aid of plants. Children can also learn through doing, which helps them to improve their gross and fine motor abilities.	It is possible that some plants are toxic or dangerous. Among the plant life, there might be nettles or thorns. There could be animal excrement near or around the plants.	Children and adults.	Children should not touch or eat any plants, and they should be educated about the risks associated with some toxic or harmful plants. Children should be advised to use additional caution when around plants because some species may have thorns or nettles that could cause harm. Adults should inspect the plants and the area surrounding them to ensure that there is no animal excrement for youngsters to touch or step on. Ensure to take a first aid kit.	Low.

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Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and associated risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk after precautions RATING: L/M/H
Ropes.	Children can benefit from ropes since they are encouraged to solve problems. Additionally, they can help children by boosting their confidence and motivating them to take risks. Therefore, children can improve their strength, balance, and coordination by using ropes.	The ropes might be broken or damaged, which could result in children falling and possibly hurting themselves or those around them significantly. Children might hurt themselves tripping over the ropes. Rope burns can occur when children cling onto the ropes tightly while sliding.	Children and adults.	Adults should evaluate the area to ensure it is safe, as well as test the ropes to ensure that they are secure and safe for youngsters. Explain to the children the need of being safe and careful around the ropes. Inform the children about rope burns and how they can arise. Ensure to take a first aid kit.	Low.

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Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and associated risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk after precautions RATING: L/M/H
Sliding down Mud.	Children's motor skills can be stimulated by sliding through mud. Additionally, mud helps strengthen children's immune systems. Children gain knowledge about speed, gravity, and friction from the wet mud. Mud makes children happy.	Children may get mud in their eyes, which could hurt or irritate them. Any debris in the mud, including rocks, could cause injuries to children. There could be animal excrement mixed together with the mud, and children could also run into each other.	Children and adults.	Ensure that children are wearing appropriate clothing and footwear. Advise the children to use caution while handling the mud so that it does not get in their eyes or the eyes of other children. The location should be inspected by adults first. Ensure to take a first aid kit.	Low.

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Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and associated risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk after precautions RATING: L/M/H
Bug hunting.	Children's hand-eye coordination and observational skills are both enhanced by bug hunting. It also supports children's gross and fine motor abilities and motivates them to sort and count the number of different bugs they can locate as well as count the number of bugs they can find. It additionally encourages children to examine the bugs' colours and fine details by using a magnifying glass.	Certain bugs have the potential to sting or bite children. When children lift big boulders or logs, they run the risk of hurting themselves. While looking for bugs, children could trip or fall. Children may come into contact with nettles or thorns and get rashes or blisters.	Children and adults.	Ensure that children are aware of which bugs can cause harm. Explain to children the need of handling large objects with caution. Ensure to take a first aid kit.	Low.

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Part 4

According to Herr (2022), preschoolers have an innate curiosity in maths and science. Young children explore their surroundings in almost everything they do. Therefore, children who consistently engage in science and maths create circuits that speed up and facilitate their learning. Additionally, McLennan (2017) suggests that the great outdoors is full of excellent opportunities for mathematical learning with a scientific connection that can interest and engage youngsters in real-world problem solving. Moreover, Wisbey (2018) contends that children pick up mathematical concepts and abilities organically through their outdoor experiences. They will use their imaginations and imaginative play to count, measure, investigate shapes, and build mathematical concepts. They will use the abundance of nature outside to continue their education.

Furthermore, as stated by Tovey (2018), Friedrich Froebel believed that children should encounter nature in all of its qualities, including shape, energy, material, sound, and colour. Additionally, White (no date) believes that young children flourish and develop optimally when they have free access to stimulating outside environments for learning through play and real-world experiences. For this reason, White (no date) emphasises that a child cannot be the same indoors, for young children, the outdoors is an essential, unique, and profoundly stimulating environment. As a result, according to Baranek (2024) early maths discovery is facilitated by permitting conditions that allow for both indoor and outdoor play. Children intuitively recognise shapes and numbers while they are outside. They are able to build dens, examine, and explore. With the aid of tools such as boxes, crates, and building blocks, they are able to learn about shape, space, and measurement. Consequently, Dancer (no date), implies that creating an environment that is interesting and offers rich areas of provision is one of the most important parts of the adult role. This entails spotting chances for maths learning outside, improving the resources available, and highlighting the special features of the natural setting. However, it is crucial to note that a practitioner's responsibility outside is to engage as a co-player with youngsters and expand learning.

According to Pratt (2011, cited in Wisbey, 2018), children need to acquire a "mathematical disposition" in order to become proficient mathematicians. He suggests that mathematics can be assisted by having children perform maths outside, where they can gain a sense of the mathematical world around them and connect what they are learning to real-world experiences with natural materials. As a result, Ranheim (2020) states that Simon Nicholson originally used the phrase "Loose Parts" to characterise items in an environment that encourages exploration

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and creation. Therefore, natural loose parts are easily found in practically any area and can be collected for nothing, which makes them ideal teaching materials. Natural loose parts, according to Ranheim (2020), have numerous mathematical applications. A variety of pine cones can be utilised for classification, sorting, and counting. Shape and symmetry can be studied with leaves. Rocks can be weighed or compared to one another. All of the fundamental subjects of early mathematics can be explored in a creative manner using natural loose components.

However, according to Rawstrone (2017), children can pick up a lot of knowledge from just playing outside when they realise that harmony and balance are necessary and that there is a soul in the earth. Both the indoor and outdoor learning environments are beneficial to one another. Children learn by doing, which is crucial, according to John Dewey. Their hands, mind, and all of their senses are all connected when they are "hands on." The preschool playground is a perfect place to teach every subject in the curriculum. It is crucial to incorporate all elements of nature, including stories, paintings, music, and songs. Additionally, as stated by the Welsh Government (2022), children's understanding of mathematical concepts can be scaffolded by a well-planned and organised environment. This includes providing them with opportunities to experience number, shape, and pattern in real-world contexts, both indoors and outdoors, through both visual and practical means.

Furthermore, Parry (2022) suggests that an adult's role is to get children enthused about maths outside, regardless of the weather, cold and rainy or sunny and dry. Adults have the ability to create an atmosphere full of possibilities. Children feel secure and prepared to interact with the world around them in this environment. There will be a wide range of fascinating materials and opportunities for learning that appeal to all the qualities of successful learning while providing risk and challenge. As a result, Parry (2022) underlines that the outdoors is an ideal environment for truly embedding mathematical thought and conceptual comprehension. Children can practise their skills and experiment while gaining confidence in their abilities via hands-on activities. It is a method for social learning as well as problem solving, concept testing, and engaging with risk and challenges. The outdoors are by their very nature places of freedom, wonder, and awe where curious minds can grow.

Additionally, Bilton (2016) suggests that adults' attitudes and behaviours outside have a significant influence on what occurs there and how well children learn. Therefore, it is essential that individuals who are involved, attentive, and passionate about the outdoors and recognise the value of outdoor learning provide children with the support they need. However, Nursery Resources (2018) emphasises that the development of children is greatly aided by being outside. Compared to indoor settings, they offer a higher sense of freedom and independence for the experience

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and development of a wide range of abilities. Children can engage with the natural world through outdoor learning places and surroundings, which stimulate all of their senses. Children who tend to be more reserved indoors may frequently "come out of their shell" when given the opportunity to play and learn outside. Children can also practise problem-solving, taking risks, and large-scale play in safe outdoor learning spaces. With outside space, they may be creative in new ways and employ all of their senses.

Furthermore, as suggested by Moorhouse (2019), the outdoor play area should have materials that support learning in all subject areas and aid in creating links between various subjects. Provide measuring cups, metre sticks and tape measures, for instance, in maths. Additionally, supply pulleys, scales, and magnifying glasses for science. For this reason, Harman (2023) suggests that careful consideration should be paid to where mathematically related resources should be placed in early years settings in order to create an enabling mathematical environment. In addition to serving a developmental and educational goal, these materials must be interesting and captivating to all learners. As stated in the Early Years Foundation Stage (EYFS) statutory framework, adults' roles in EYFS settings and how they promote children's learning and development in an enabling environment must also be taken into account.

Additionally, Quist (2021) asserts that spending time outside fosters curiosity and inquiry, both of which result in active learning (experiential learning). When children actively participate in the learning process, it is known as experiential learning. According to Calles (2019), preschoolers have an innate curiosity that drives them to explore, learn, and attempt new things. Children are naturally curious and want to try everything because of this. They are drawn to whatever they have never seen before. Utilising a child's passion in learning can benefit their development both at home and in school. As a result, Calles (2019) highlights that experiential learning is an educational approach in which children have an active role in their own learning.

Furthermore, as stated by Hawthorne (2021), the Curiosity Approach supports all facets of outdoor education. There are numerous outdoor activities that can help children develop their skills and interests, such as insect hunting, digging in the sand, planting seeds in old tyres, climbing, rolling and building dens. Likewise, according to Hawthorne (2021), advocates of the Curiosity Approach support repurposed and recovered materials. Playing with natural materials helps youngsters to grow a strong love and respect for their environment. Children can create and explore with various patterns and textures when painting, for instance, by using pinecones and leaves. Providers might also encourage children to gather objects that interest them and bring them in for their friends to investigate. In addition, Tovey

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(2018) suggested that the importance of outdoor play cannot be fully experienced in bland, safety-surfaced play places. Playing outside has the ability to stimulate children's imagination, curiosity, and creativity while also improving their health and general well-being. The environment's quality and the interactions within it are vital, as Froebel contended. Children's curiosity, exploration, and perplexing questions are infinite in the garden. Moreover, as noted by Tovey (2018), Froebel thought that straightforward, unrestricted materials aid in children's representation of their thoughts, emotions, and experiences. They let children investigate many meaning domains. These were referred to by Froebel as "forms of beauty," "forms of life," and "forms of knowledge." Therefore, each given representation may incorporate elements of the child's own experience, as well as elements of knowledge such as mathematics or science, as well as artistic elements like symmetry, pattern, or shape.

However, as reported by Solly (2016), Dr. Susan Isaacs (1885–1948) encouraged children's innate curiosity, their interaction with nature, and their learning about the actual world, which helped them develop their ability to reason, discover, and think through inquiry. Also according to Solly (2016), young children can acquire a variety of social skills and friendships from direct encounters with a variety of natural materials by spending time outside. Deep desires are satisfied by their curiosity and capacity to get "lost in the experience," which also enables them to integrate into a vibrant, culturally diverse group. They consequently feel as though they belong. Like any good recipe, these foster an environment of interactions that strengthen social skills, connections, and the delight of spending time with both adults and peers. Thus, nature will allow individuals to support all young children in learning holistically across the entire curriculum and becoming better future citizens, exactly as the pioneers advised all those years ago, by integrating an outside approach to play and learning.

In summary, research indicates that teaching science and maths to young children outside is essential to their learning. It has been demonstrated that youngsters can naturally acquire mathematical concepts and skills merely by playing outside because they can use their imaginations. Friedrich Froebel also thought children should experience nature in all of its forms. Nonetheless, it is claimed that one of the most crucial aspects of an adult's role is to create an engaging environment. It is also demonstrated that natural loose components can be used to investigate early mathematics in an imaginative way. John Dewey also argued that it is important for children to learn by doing. Adults should also encourage youngsters to engage with mathematics outside of the classroom where adults are able to create an environment that is full of opportunities. It follows that the children's interest and the surroundings play a critical role in their outdoor learning experiences.

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