

Encouraging children's curiosity in nature



Source: Edwards, L (2024) *Swiss Valley outdoor play setting*

Abundance of play and learning experiences

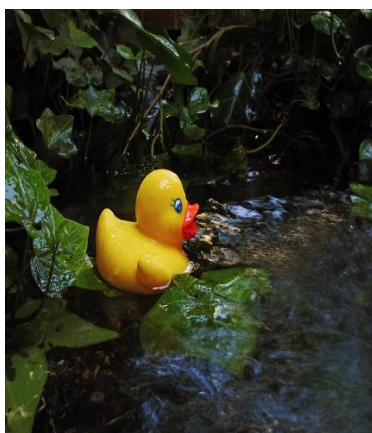
This riverside area for early years children aged three to five was carefully chosen to encourage children's exploratory skills and encourage their curiosity of the outdoors by learning and developing through outdoor play. This area captures a host of various scientific and mathematical sources that will aid the children's development, knowledge and understanding of nature, and the awe and wonder of the world in which they learn.

There is a multitude of opportunities to experiment and explore all within close proximity at this setting. For example, we have the beauty of the noisy waterfall, the gentle swaying and creaking sounds from the trees and vegetation, shadows being cast by overhead branches, reflections in the water, and birds and insects aplenty. The children's senses will be stimulated by the different colours and sounds, having the opportunity to feel and experience what nature is teaching them. Scientific and mathematical concepts will be investigated using various methods and techniques, drawing upon the natural inquisitive nature of early years children.

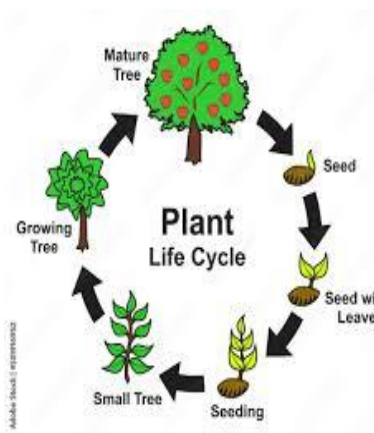
The Foundation Phase Framework (2015) highlights within the statutory areas of learning that mathematics can help to develop a range of skills and can be an

enjoyable experience when applying a practical and play based approach to problem solving. The framework also suggests that children should be able to participate in activities which will allow them to learn and gain a scientific understanding of the world through exploring, experimenting and asking questions in order to build upon their natural curiosity.

With this framework in mind, when taking part in this play session children will learn about the life cycles of trees, different materials in their surroundings, visible effects with seasonal changes, and gaining an understanding to gravity and force. To add further dimension into the play setting, practitioners can consider introducing additional resources to support the curiosity and enhance the learning experience. Perhaps experimenting with a rubber duck and a toy car in the stream. Considering the materials that they are made of, are they the same or different? Which is light and which is heavy? Do you think they will sink or float, and why do you think this? However, the learning experience can still be achieved by simply using the resources available around you. The children could gather different sized stones and place them across the water to see what happens. Can they guess what might happen and if they know what name is used for the construction that they have formed? What will the water look, and sound like on one side of the dam in comparison to the other side? This will encourage the learners to understand the importance of considering the weight of big or small stones and the force of the water in which they are placing them.



Source: Alamy (n.d.) *Duck in river*



Source: Adobe Stock (N.D.) *Plant Cycle*



Source: Montana outdoors (n.d.) *Build Dams*

Welsh Government (2014) was the first in the world to enact a law on children's play and emphasized that it does not only play a part in aiding a healthy wellbeing for young children but also plays a fundamental role in supporting cognitive development, physical milestones and emotional and social aspects during their childhood. The charity Play Wales (2017) who are supported by Welsh Government have produced a framework on loose parts in play and highlight the importance for children to become at one with nature. It states that there is no specific rule when it comes to loose parts as there are endless options to enrich and facilitate the learning experience.

The mature woodland area as pictured provides a perfect natural setting giving scope for an abundance of loose parts that can be utilised such as pinecones, mud, stones, sticks and bark.

Loose parts at the stream



Source: Stroud Centre (n.d.)



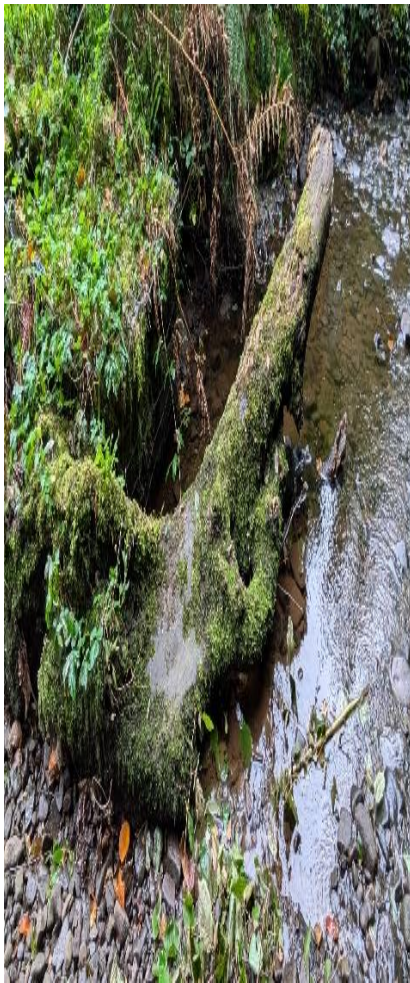
Source: Tech early years (n.d.) *Pinecones*



Source: Getty Images (n.d.) *Muddy Hands*

Play ideas

Set-back, somewhat away from the riverside, might be the perfect area for the more reluctant child to explore the log. Where is it from, how is it there, why is there moss and what could live under this?



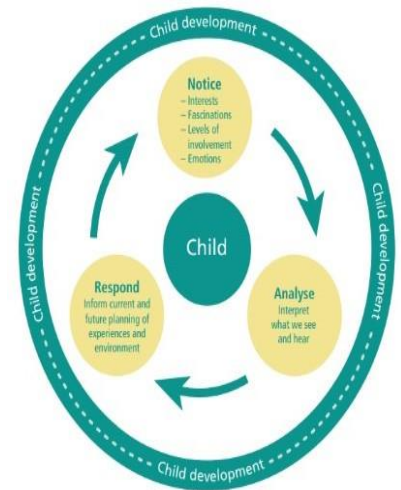
This particular image could open up many scientific questions from the child's perspective and could also result in problem solving these independently. Can the child see what tree it has fallen from, why did it stop here, and will it move again. Enabling the child to project their natural curiosity and self-reasoning skills, will assist in developing their confidence and self-led learning. The practitioner could support this learning with metacognitive questioning for example - if we rolled this over, what do you think we would find underneath, or, why do you think there is an area of the tree trunk without moss. This form of questioning is guided by the practitioner but also allows for the child to be in control of the thinking process behind it, and usually results in further thinking or experimentation to find out the 'what if' and 'why is' curiosities which will inevitably help them make sense of the world.

Source: Edwards, L (2024) *Riverside log*

The importance of observations

The role of the practitioner is vital to support children to learn through play. The curriculum for non-maintained settings in Wales (2022) describes observation as a major role during practice. The child should always remain central to the process when conducting observations which will provide the practitioner with key indicators to identify if the child is engaging, showing an interest and is motivated. What can be acquired during observation is integral to how we as practitioners will analyse and respond to the child and their future development.

Applying a holistic approach to observations in the example photo will not only provide the children with a 'free reign' attitude but will also aid us as practitioners to learn more about each individual. What one child might find fascinating, another will not, and some children will take more risks than others. Having the ability to stand back and constantly assess the child whether it is through a planned process or if it is more spontaneous and 'in the moment', will ultimately provide an understanding of the child in a way which we as practitioners can interact and respond to situations to support the child in the best way possible.



Source: NDNA (n.d.) *Observing Children*



Source: Edwards, L (2024) *Waterfall*

This area might draw more interest to the children that are considered to take more risks, however with time and by observing and assessing their peers, the more cautious but inquisitive children may also wish to get involved and explore. Fun activities can support their mathematical and scientific understanding. We could explore why the water is making a louder noise here than just a meter further upstream. Does gravity play a part into how and why the water is falling downwards into the stream. What does the water feel like on your hands here in comparison to the other areas of the stream. We could consider playing a game of pooh

sticks and looking at the differences of a child whose stick flows down the central path of the stream, and that of a stick that takes the pathway towards the waterfall. Firstly, are the sticks similar in size, shape and weight, and what has caused them to flow in different routes. Was one faster than the other, and what do you think will happen when the stick gets closer to the force of the waterfall. Point out that the shadow of this waterfall is being cast backwards across the image, how and why can we see this, does it look like this all day and what happens to the reflection if we throw a stone into it?

To summarise, we have learnt the importance of play and how we as practitioners should provide a holistic approach in our practice to enable children's play. Providing interesting and varied environments will entice and encourage the child to grow and develop in confidence as they explore and discover by themselves how nature works. All of the concepts discussed will engage the children to dig deeper into their curiosities and understandings of maths and science in a way which is a hands-on real-life experience, which Froebel (2013) regarded as the single most important part of a child's development.



Source: ITV Wales (2023) *Northern Lights*

RISK BENEFIT ASSESSMENT

Location / Activity:	Swiss Valley Riverside Outdoor Play Session	Date:	04/10/2024
Assessor:	Lindsey Edwards	Review date:	02/09/2024

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Children's voice	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
Exploring the play setting with uneven and slippery surfaces	Explore various areas in and around the stream. Develop balance techniques. Discovering less bumpy areas with smaller pebbles and more uneven grounds with larger stones in the stream with sticks and logs.	I love it when my feet feel wet, but it is just my wellies that get cold when I step in the water. It feels different when I walk on the stones to when I walk on the mud.	Slips, trips, falls, that may cause cuts or bruising. Getting wet and drowning.	All children and adults	Suitable waterproofs and footwear to be worn by all early years children, staff and assigned assistants. All staff and assistants to continually observe environment for change in weather and flow of water / rise in depth. Advise children of uneven nature of ground and implement their balance techniques.	Low
Lifting and moving logs, sticks, pebbles and large stones	Exploring for loose parts to encourage imaginative play and develop construction skills. Gains awareness of science and maths understanding and problem solving of how structures stay together, how many objects can be collected and looking at shadows from objects.	We can build a dam I love making the water stop. I play with my friend to collect sticks and see which is the fastest to float to the waterfall. I throw different things into the water some make a big splashing noise and sink, things that aren't as heavy like leaves and twigs are quieter and float.	Injury to self and or other people caused by dropping onto feet or hands, throwing stones and hitting personnel or causing eye or other injury from sharp sticks	All children and adults	Staff to demonstrate safe lifting techniques and remind children of safety risks to themselves and others. Having an awareness of people around them and at a close distance.	Low

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Children's voice	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
Exploring around the waterfall	Hands on experimenting and gaining an understanding of gravity and force through science and maths.	The water pushes my hand down and it tickles. It is really loud, and the water is all frothy. Sometimes it splashes onto my face. It moves really fast.	Drowning, becoming submerged. Getting wet from head to toe. Becoming too cold and unable to regulate body temperature.	All children and adults	Close supervision – staff or assistant with up to date first aid training certificate to monitor this area at all times. Constant assessment of water depths and speed of flow. Children are educated in the dangers and risks of water.	Low
Natural forestry, plant and insect life	Being at one with nature and learning about living things. Stimulates the senses. Understanding of scientific concepts of life cycles and various habitats in which different things live and grow. Encourages creativity and loose parts play.	There are so many interesting things to look at. I can collect different flowers and look at the shapes of leaves that come from different trees. Some leaves are crunchy and others are not. I like to look for bugs, they hide under stones and by the trees.	Allergies or reactions. Ingesting poisonous plants or fungus. Stings, bites cuts and grazes, from branches insects or uneven ground	All children and adults	Staff and assistants with up to date first aid awareness and have received training to identify hazardous plants or fungus. Children are reminded that nothing should be ingested and warned of the dangers of poisonous berries, nuts, mushrooms. Children encouraged to keep hands away from face and eyes when handling items during the exercise, and always wash hands after play.	Low

Part 4

Supporting and encouraging children to engage with mathematics and science through outdoor play

Within this section of the portfolio, I focus on evaluating the role of adults and how they support early years children in learning and understanding the concepts of mathematics and science.

Firstly I explore in depth how practitioners can facilitate an enabling environment to achieve the best possible learning outcomes for children, and I will unpack and discuss some of the many different ideas and approaches available to support children through play. I will also discuss what resources can be introduced to encourage natural curiosity and consider how the use of metalinguistic language can aid understanding and development.

Finally I provide the reader with an insight of the many concepts and theories which have influenced educational curriculum, frameworks and ongoing governmental targets to improve children's experiences in learning; and their successful development and academic progression.

To begin we must first appreciate the value of play for children, Sutton-Smith (1999) believed that play deprivation would be disastrous, not only for the child but it would also impact upon the extended family and even society. In many ways, depriving a child of play can be seen as neglect, and there are many different factors which are needed to create a positive and welcoming experience. The UNCRC declares in Article 31 that all children have a right to play and it should be respected and encouraged, with age relevant provisions put in place to meet the needs of all children (Brown, 2013).

When considering a suitable environment for children to play and learn, it should be appropriate to meet the needs of each child. Shaw (1987) believed that providing a spacious environment enriched with variety and resource, would provide reassurance and security for children. Inner self-control and confidence will grow thus providing a more valuable play experience and resulting in better educational achievements (Maynard, 2014). This is echoed by Harding (2005) who believed that being able to experiment outdoors with nature provides many more channels of

learning opportunities that will stimulate senses in so many ways which can only be achieved by experiencing it in the natural environment (Waite, 2011).

The article *Young Children's Outdoor Play-Based Learning* (Waters, 2019) emphasises the potential of a breakdown in the learning experience for the child, if the enabling adult does not have an in-depth knowledge of play, an understanding of children's capabilities and the educational outcomes that an outdoor space can bring. These values are critical and will shape the child's academic development. The Curriculum for Wales (2023) addresses the vital role that the environment plays, to inspire children's curiosity and entice awe and wonder as they learn. Providing an effective learning environment will create an experience where children learn about risk taking, resilience and can develop physically and emotionally whilst being introduced to mathematical concepts of nature. In support of this, one of the overarching principles from the EYFS Statutory Framework (DFE, 2023) states that children develop positively when provided with supportive practitioners and an enabling environment.

Warden (2012) regards enthusiastic and committed practitioners whom they themselves engage in teaching outdoor play, is central to positive outcomes, adult intervention should be minimal, however enabling adults will facilitate children's learning. This curriculum and framework closely links to the Froebelian way of learning, which sets out key principles that promote first hand experiences, free choice of movement and trusting relationships. Children have a free reign of independence where they can experiment and explore the environment for themselves and at their own pace with minimal intervention (Tovey, 2013). This links closely to Nicholson's theory on loose parts which states that children like to use imagination to create new things and feel a sense of enjoyment (Nicholson, 1971). In contrast Reggio Emilia educators prepare outdoor learning environments in a more structured and planned manner, providing organised resources that are intentionally placed for the child to explore (Thornton, 2014).

Although both styles of teaching are different in many ways, there are however similarities between Reggio (2014) and Froebel (2013) when considering relationships between children and educators. Reggio also emphasised the importance of relationships and regarded it as a central factor of successful learning.

A more recent study by Tinney (2023) highlights the potential barriers for practitioners and the need to undertake additional training that will provide a deeper understanding of outdoor learning and the way in which it can enable children to increase their cognitive development.

Bruce (2012) explains that if we have good observational skills, it will provide us with a greater understanding into the dynamics of play and provide us with a greater insight of how children learn through play. Observing, should strengthen our admiration and respect towards children and broaden the way we think in practice but not to be used as a tool to control their learning. Davies et al. (2019) Suggests that simple interventions are all that is needed for the child to trigger their own thought process of understanding and learning new things. This could mean challenging the children to see if they are able to find materials to build a raft, or what could they find that will make the biggest splash. This can be seen in Vygotsky's zone of proximal development which explains the space between the child's developmental capabilities and the potential in which they could improve their problem solving with support or intervention from an adult (Montague-Smith et al. 2018).

Having access to a variety of resources is also vital when it comes to children's development. Simon Nicholson (1971) spoke about learning resources as loose parts and described them as 'variables'. He believed that all young children became little inventors when they explored and experimented with these variables (Hwb Wales 2024). Furthermore, Ward (1978) stated that children have the inner ability to play anywhere they choose, and are capable to utilise any object they wish into a 'play thing'.

When considering mathematics and science in the outdoors, they are both brought together through the elements of nature in play, an example can be seen in Part 1, Swiss Valley outdoor play setting (Edwards, 2024). Piaget's constructivist theory states that curiosity is the force behind children's learning, and if there is limited curiosity, learning can be delayed. He believed that when children take part in symbolic forms of play, they can form an understanding of what things are and how they work. It usually occurs over time through trial and error but are capable of learning and understanding by themselves, the world around them through the form

of repetition (Mooney, 2013). Symbolic play is seen as a process involving creativity with the use of objects in a variety of settings which forms in the place of imaginative play.

Another consideration when supporting children to engage with learning in the outdoors, is to have a sound understanding of Gibson's affordance theory. If we consider a picture of a bowl of fruit, it does not have an experiential element, and cannot be tasted, or held. Gibson (2013) describes objects not only having a spatial meaning, but having a range of possible uses as one perceives it (Baerentsen, 2002). Early years education (2016) regard children as experts in affordance who instinctively explore various play experiences in differing environments. They have a built-in ability to see past the object at face value and have the ability to create and invent multiple uses and purposes that naturally develops their scientific and mathematic knowledge. A recent study by Morgenthaler (2024) discusses the importance of environmental taxonomy and how it creates insight for the practitioner to realize the differences between an adult and child perspective of the same learning space. What might be perceived as a perfect opportunity for a child to build mud cakes from an adult point of view, could be seen by the child as a task or chore, however that same child might experience splashing in the mud a far more stimulating and enjoyable experience. This is an example of how Gibson's theory applies in early years education. Scientific and mathematical concepts can be learnt from both variants, however the latter way of learning is driven by the child and has potential for a far greater learning experience.

Robertson (2017) discusses how young children are exposed to so many mathematical opportunities in the outdoor world. Connections can be made in an outdoor environment that provide a deeper understanding of problem solving which cannot always be achieved in a classroom. Robertson believes that educators can successfully facilitate outdoor maths in a number of ways by visiting areas that will offer mathematical prompts ensuring there are varied resources and basic prompts available to guide children and instil mathematics into daily routines. This is reflected in Pradnya's (2016) article Empowering mathematical minds through play, which she claims that research suggests attaining mathematical skills during early years can be an indication of academic success in later life. She also claims that to empower mathematics in young children, appropriate support is required. Describing this

support as scaffolding Pradnya highlights the importance that this support should be strong enough to aid knowledge development, however adaptable enough to step back from the learner when they have become independently stable to progress. This is another example of Vygotsky's influence on educators, where he described the scaffolding process as offering limited assistance to help the child move onwards to the next stage, and then slowly withdrawing the support to allow independent progression (Mooney, 2013). The curriculum for Wales places equal importance on science and technology in our modern world, and within the 'Statement of what matters' there are mandatory areas that should be covered including the presence of curiosity to enable us to ask questions about the universe and being able to recognise multiple living things and how they play a part in nature. Brunton (2010) states that babies connect with the world using all of their senses and desire to explore. As they continue to develop, these experiences grow, and their need to understand becomes greater. Brunton continues to discuss the importance of appropriate intervention and modelling tools which can be used to aid scientific knowledge, believing that children will positively pick up on signals of enthusiasm and thinking out loud from practitioners. According to Brunton, the most challenging function when supporting children is the timing of interventions. When observing children during play, recognising the precise moment that one should step in to assist can have an impact on the learning outcomes.

According to the Department for Education (2015) pedagogy combines the style of how teaching is conducted which is essentially driven by the practitioner's own values and beliefs. Pedagogical techniques have developed over time analysing learning styles and patterns of children. It is essential for adults working with early years children to reflect on past experiences which will influence the teaching styles going forward. Another significant factor in pedagogy is knowledge, which is the catalyst for understanding and motivation. Research conducted by Melhuish et al. (2013) acknowledges that a more traditional form of teaching within the classroom is still important. It does however note that introducing alternative strategies in order to provoke children's ways of thinking, will provide strong foundations to support and encourage children's development which is reliant upon the relationship between adult and child.

I confirm that I have not used any AI tools in the research and creation of this assignment. I confirm that I have not presented any AI generated materials as my own work. I confirm I have copies of my drafts, notes, and other resources I used, which I may be asked to provide in evidence.

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