



P.1. An outdoor learning environment which encourages curiosity, discovery and experimentation. (PxHere, 2022).

P.2. When playing, children have a tendency to thrive and become active, curious and creative learners. Tovey (2013), identifies Froebel's theory and belief, of how children become much greater learners through rich sensory first-hand experiences. Being outdoors can offer children these great experiences. Outdoor play and learning, offers young children the freedom and space to explore, experiment and investigate the world and their surroundings, emphasising curiosity (Tovey, 2013).

The image attached is an outdoor environment, which is a great opportunity for young children to thrive through play and learning, whilst being curious and experimenting.

Education Wales (2021), clarifies within the curriculum for funded non-maintained nursery settings, how this holistic learning and experience can only be achieved,

through skilful and interested practitioners. Where they provide children with authentic, purposeful experiences within engaging and exciting environments.

The setting within the image can offer children the opportunity of exploring their senses, through touching and seeing the natural surroundings. Education Wales (2021), states that when children explore their environment, they develop a sense of belonging but further gain an appreciation of the world around them. Participating in free play or activities in the such areas, is recognised within the pedagogy of the curriculum for funded non-maintained nursery settings, as rich and authentic opportunities for the stimulation of senses (Education Wales, 2022).

The environment within the image, may encourage children to wander towards the water pond and be curious and explore. They may notice some animals within their natural habitats. An animal in particular, they are likely to discover is a Toad, leading to further discoveries of eggs or tadpoles. This offers the children the opportunity to gain insight into the animal. Children are likely to become curious of the creature, where adults may lead the discussion onto the lifecycle of the animal. The Curriculum for Wales underlines how curiosity about science leads questioning about the surrounding world. The practitioner may encourage the exploration into the mystery by questioning the children on what it is that they have discovered and make use of open-ended questions to encourage child-led play.

“What have we noticed about the toad?”
“Are there any changes to them?”

In order to provide the children with a rich learning experience, the practitioner may wish to gather some eggs and tadpoles for the children to investigate.

A clear bucket would best suit for the children to clearly see and make use of a magnifying glass to fully investigate the animal closely. Upon their discovery, the practitioner could further encourage the children to draw the lifecycle of the toad, using their fingers to draw the egg, tadpole, froglet with tail, and the adult frog in mud within the forestry area. The children could make use of their fingers or sticks to draw, where they would practise their fine motor skills and knowledge on the information they have gathered.

The Curriculum for Wales suggests how developing an understanding of the structures and functions of living things, enables learners to understand how things grow, develop and reproduce successfully (Welsh Government, 2022a).

The science and technology area of learning, links to the creativity and innovation skill within the curriculum, where it greatly encourages curiosity and inquisitiveness about the world, where learners question their knowledges to deepen their understandings (Welsh Government, 2022a).

The Curriculum for Wales identifies, how play during early years forms an important part in the development of mathematics and numeracy, enabling learners to solve problems and explore ideas. Through play and exploring within the environment in the image, the children will discover the many leaves that would have fallen to the ground, being different shapes, patterns, colours and sizes. Within the Curriculum of Wales, it is identified how Geometry and reasoning of sizes and properties of shapes and their surrounding spaces, helps learners to make sense of the physical world and the world of mathematical shapes (Welsh Government 2022b) Children are able to explore and compare the shapes and sizes of the leaves through investigative play in the outdoor environment. Children-would make use of sustained shared thinking with their peers, when comparing and discussing the leaves they have discovered. Adults may wish to encourage sustained shared thinking with the children, when approached by the children.

Practitioners could support the children during these investigations by providing children with crayons, clipboards and paper, for the children to print the leaves and fully discover the shape and patterns that run throughout. An activity that could follow the children's leaf printing, could be where the children right the colours or potentially the type of tree in which the leaf has fallen from. Practitioners will be able to encourage the children to describe the shapes and colours they see within the leaves and make use of open-ended questions. The children's mathematical vocabulary will be forced in a fun, playful way. Education Wales (2021) understands, the importance of children having practical experiences that encourage the use of simple mathematic vocabulary when exploring quantity, numbers, shapes and patterns.

Adults could further encourage mathematical development, through asking the children to categorise the leaves, whether that be in colour, size, or shapes. The foundation phase framework suggests how children in the early years should have the ability to compare, sort and order objects (Welsh Government, 2015).

Practitioners would be complying with the framework, through offering children mathematically rich environment to explore and develop mathematical concepts, but also encourage them to recognise and use shapes during their play.

The environment offers the children great opportunities to study trees and explore scientific or mathematical concepts of the growing plant. Adults may encourage the children to explore the forestry by offering them measuring tapes, in which they could make use out of to measure the trunk of the trees. The children could be given rope and paper to tie around the girth of the trees, and make note on the paper, the size of the trunk. This being a mathematical themed play, where children make use of a measuring tape, using mathematical terminology, further using their numeracy skills to note the measurements. Working with their peers, the child-led play may lead to them discovering the largest and smallest trunk. The children will share their obtained knowledge with one another, as to how to measure correctly. In order for the adult to facilitate the scientific concept of the play, they could explain to the children that the size of the girth determines the age, where the children could work together in sustained shared thinking. The sharing of ideas and knowledge with one another could lead to them understanding the largest trunk being the eldest.

P.4.Supportive evidence suggests how a child's experiences in nature, especially unstructured play in natural settings, provide an aid in cognitive, physical, social and effective development during a child's early years (White, 2020).

Being in the outdoors, offers an enriched learning environment where children's imagination, inventiveness and creativity is able to flourish.

Adults are able to aid the creativity in children when outdoors, through capturing and utilising the special nature outdoors, in which will provide holistic learning opportunities.

In order for such environment to be one with rich learning opportunities, adults must ensure the environment is well-planned and resourced in order to support plenty of

first-hand experiences where child-led activities are promoted (Department for Children, Education, Lifelong Learning and Skills, 2009).

There are great opportunities for applying mathematical and scientific skills across the curriculum through active learning in the outdoors. There are great educational benefits when applying these themes during fieldwork. Welsh Council for Outdoor Learning (2018) claims, that providing high quality outdoor learning, immensely contributes to the four purposes within the Welsh Governments Curriculum. Children when offered rich outdoor learning environments, are provided with the knowledge, skills and behaviours in order to gain outcomes in the four purposes.

Frobel's theory recognises the strong educational link there is, between play, nature and the outdoors. Hi study recognised how being out in the 'garden', was most beneficial in nurturing children's spiritual, cognitive and physical understanding and skills (Tovey, 2013).

The physical development gained through the children exploring, running, climbing is also within scientific concepts. Although these activities also have a great link to cognitive development. When making use of equipment outdoors, the children, the physical activity, greatens blood flow to the brain, encouraging brain development and the use of equipment, improves fine motor skills, hand eye coordination, leading to cognitive development. The use of 'loose parts' is also linked to such development, where the gathering of materials requires physical activity.

Loose parts in the outdoor environment, create rich environments for the children to be able to follow their interests and allow for curiosity that leads their way. 'Loose parts' are known, as a mixture of natural and man-made materials, where children can make use of and manipulate in a variety of ways and the handling of 'loose parts' requires children to be creative and imaginative (Inspiring Scotland, 2019). Loose parts within a natural environment can include, mud, sticks, water, pinecones etc, which offer children limitless possibilities for their uses.

The use of natural resources can be used in a number of mathematical concepts. Mathematical play in the outdoor is very nearly, always made up with the use of loose parts. adults can encourage and strengthen the connection between the child and the materials, through working with them. This does not only offer the child the

opportunity for greater connections between them and the world, the interactions offer, rich mathematic language, in which they further develop such vocabulary (Ranheim, 2020).

However Inspiring Scotland (2019), suggests that when exploring loose parts, the play should near far be completely child-led.

Adults find the process of loose play, one difficult to resist urge of stepping in too soon, without giving the children the full opportunity to explore and discover in their own way.

Adult may support the children with their child-led play in the outdoors by refraining from interruption, enable the children to develop skills and explore their own values, leave the content of play to the children and waiting for the children to invite the them into the play. Adults should be inclined to observe play, when children make use of loose parts, in order to understand and support learning and further aid in planning. It is recognised that both teacher-led and child-led activities are essential, for creating environments in which are encouraged by educators to provide holistic learning experiences in the outdoors (Hunter, 2019). Inspiring Scotland (2019), further suggests how adults, when observing children, can gain greater knowledge of the children's understanding and abilities and understand how and why they use loose parts within their play, discovering the creativity in children.

Through movement and self-experimentation in the outdoors, children are able to gain greater understanding of the surrounding world, in which Piaget's theory underlines. Piaget understood how children's ability to learn was greater when they explore within stimulating and challenging environments, and where given the opportunity to play and discover for themselves. Through exploration to gain understanding of things, children become 'little scientists' in Piaget's eyes (Professional Association for Childcare and Early Years, 2016). They are to try and experiment as they wish, in order to learn. Froebel's theory also agrees with Piaget, in the sense that children are to explore and experiment (Tovey, 2013), and further suggests how children should be encouraged to take risks whilst doing so.

The Welsh Government agrees with Froebel's approach in outdoor learning, where children in the curriculum are to be encouraged to take risks during their time

outdoors, claiming that taking appropriate risk in the environment, is a fundamental part of the outdoor learning experience (Welsh Government, 2015).

Loose parts in the outdoor environment, create such rich environments for the children to be able to follow their interests and the curiosity that leads their way. Loose parts are known as a mixture of natural and man-made materials, where children can make use of, use their creativity and imagination to create things. Making use of loose parts encourages a inventiveness (Inspiring Scotland, 2019). Loose parts in the natural environment can include, mud, sticks, water, pinecones etc, which offer children limitless possibilities for their uses. Mathematical play in the outdoor is very nearly, always made up with the use of loose parts (Ranheim, 2020).

The use of natural resources can be used in a number of mathematical concepts. Adults can encourage and strengthen the connection between the child and the materials through working with them. Where it does not only offer the child the opportunity for greater connections between them and the world, the interactions offer the rich mathematic language where they develop such vocabulary (Ranheim, 2020).

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When observing children, adults can gain greater knowledge of the children's understanding and abilities and understand how and why they use loose parts within their play, discovering the creativity in children (Inspiring Scotland, 2019).

Adults can support and encourage children's engagement in Scientific and mathematical concepts, through potentially handing over the lead to the children themselves. Although practitioners often find child-led activities difficult to engage with, its learning is greatly beneficial (Waite, 2011). Children are able to gain independence when learning and practitioners are able to gain greater understanding of their children during learning and their understanding in terms of scientific concepts (White, 2014).

White (2014), states how outdoor learning must be child-led due to the environment having such freedom for children to move freely, to explore messy play and use their senses in order to explore the outdoor to make sense of the world and their own feelings and ideas.

Adults must provide children with organised, stimulating play-based activities, for them to be independent learners and are able to follow their own interests when in the outdoors.

When outdoors, sustained shared thinking is encouraged through the use of 'loose parts'. The link between sustained shared thinking and loose parts is due to 'loose parts' providing children with the opportunities for thinking, during engagement with the resources in the outdoor environment. Children when encouraged to follow their own interests outdoors, are more motivated to listen and share ideas with peers and adults.

Such metacognition can be encouraged by adults, through the use of open-ended questions during interactions throughout play and exploration. The support through interactions and running commentaries, provides extending vocabulary to children. These interactions where sustained shared thinking is developed, leads to children sharing ideas and interests with peers, further leading to such thinking during child-led play (The British Association for Early Childhood Education, 2017).

Purdon (2014) recognises, how adults within early years settings have some confusion as to how sustained shared thinking can be put in practise efficiently, in order for children to develop strong thinking skills, where they practise sustained shared thinking, adults must guide and challenge their thinking capabilities.

There is a strong link to such adult support in sustained shared thinking to Vygotsky's zone of proximal development theory. Vygotsky understood the zone of

proximal development as the distance between the current level of development in problem solving within the child and the level achievable, when supported by the environment, adults and more capable peers (Shabani, Khatib, Ebadi, 2010).

Siraj -Blatchford

and Sylva (2004: 725) have suggested that adults need to have understanding of the

child's 'cognitive, cultural and social perspective' to enable bridges to be built between

the child's current knowledge and knowledge the child is capable of gaining.

Therefore

the adult has a key role to play in knowing the child, being aware of their level of development and through SST having the skill to support them to move their thinking skills onto the next level.

Several researchers (e.g. Rogoff, 1990; Rinaldi, 2006; Jordan, 2009) emphasise the importance of sharing the thinking, engaging with the understanding of the other and studying meaning with children, which suggests some possible links between co-construction and SST. Siraj-Blatchford (2002b: 85) in addition, states that 'child development progresses as children experience more challenging sustained shared thinking in their play initially with adults, then in reciprocal peer play and later in sophisticated collaborative play.' Whereas in scaffolding the teacher is in control and often has an outcome in mind, in co-construction, the interests and dispositions of the

learner are all important and the skill of the practitioner lies in establishing intersubjectivity, allowing the child

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Adults must understand the child's cognitive, cultural and social perspective to enable a link between the current knowledge held by the child, and the capable

knowledge that can become when supported. There for, the adult must fully understand the child's knowledge and make use of sustained shared thinking to aid further development.

Sustained shared thinking in mathematical concepts, is effective practise (Purdon, 2014).

Such thinking in math concept is developed during play based, outdoor learning, where children are active learners. Adults must make use of mathematic terminology during their interactions with the children in order for them to learn, understand and make use of the terms themselves (Keith, 2018). Such support, within mathematical concepts in the outdoors can include adults, using open-ended questions, such as, "if this is small what is that one?" or "how many do we think are there?".

There are many ways of supporting children with sustained shared thinking. Listening and observing, showing interest, smiling, giving eye contact, respecting their ideas, decisions and choices, asking children to elaborate on these, are just some ways of encouragement (Siraj-Blatchford, 2005).

The Natural environment can provide great opportunities for children to engage with science activities, including the exploration of science themes such as plants, animals and other living things. However, Skarstein and Berrerfjord Ugelstad (2020), recognised how adults within the study, found providing scientific learning opportunities in the outdoor a challenge. Practitioners struggled to facilitate the learning due to, themselves lacking in knowledge and equipment on science themes. In order to overcome these barriers, the study suggests how teacher training programmes can aid these challenges, through providing adequate science learning support. However, lack of time proved to be another issue reported, when providing science learning themes in the outdoor. The lack of time to plan and prepare rich, science opportunities made it a challenge for staff, being unable to acquire enough knowledge on science topics before attempting to put into practise.

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