

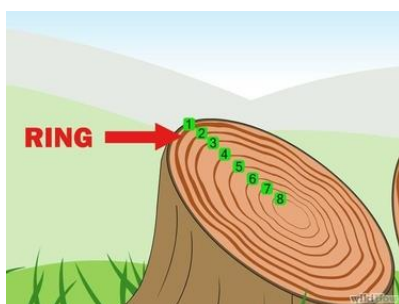
Part 1.



(Phillips 2022)

Part 2. Word count- 1180.

Pictured is an environment accessible to all children within a local primary school. As



(Weebly, no date)

an early year's practitioner there are many opportunities to use this space to develop science and mathematical concepts through observing and supporting the curiosity of the children within the early years setting. This area of outdoor space allows room for exploration giving ample opportunities for learning experiences where every

experience can involve learning even the simplest experiences including teaching maths and science through engaging with the outdoor space provided. This outdoor space is significantly different to the traditional classroom allowing room for free movement and exploration as considered by Theorist

Frobel's ideas where nature and outdoor play are essential to young children's learning and development. These experiences of the natural world around them will enable the child to understand their association with all living things and appreciate the wonders the outdoor world brings, (Tovey, 2012). These experiences given to children fall inline with the New Curriculum for Wales four purposes designed to develop independence and real-life learners. Utilising outdoor learning allows for enriched authentic life experiences. Exploring nature can aide children in becoming ethically informed citizens gaining knowledge of their surroundings and appreciating the environment they have access to. The new curriculum identifies the importance of outdoor play for children's health, wellbeing and providing regular access to the outdoors supports children in having positive attitudes, beliefs and creates safe spaces for children to explore their abilities and gain positive self-perception (Welsh Government, 2022).

One scientific concept that could be investigated in this area are trees and how to tell how old they are. Children may ask questions such as why are some trees chopped down? Why are some taller than others? What are the small trees with tubes around for? These questions could provoke an interest in the age of the trees within the area, sparking a need to explore and discover. There are two ways in which this could be done, firstly where the children could count the rings of the cut down logs encouraging counting skills but also incorporating shape discussing the 3d shape of the log and what 2d shape the face is, not only covering the science of tree growth and its age but also incorporating maths skills recognising the shapes in our natural world. This could evoke conversations about the other shapes children could identify in their surroundings. As enabling adults, the practitioners could ask questions such as how old do you think this tree was? Can you estimate how many rings there are before we count them? Can you see other objects that are the same shape? Are the objects of the same shape the same size? Or are the different? If so, which is bigger? Which is smaller? Can you order the objects by size? All these questions as an enabling practitioner allow for curiosity to develop and encourage children to explore and compare their surroundings.

The second skill is estimation, as a practitioner you could introduce into the environment tools such as a measuring tape, or string and meter rulers creating engaging experiences where children could measure around the trunk of an alive tree to estimate its current age. As the practitioner explaining to the children however many inches the tree measured is its estimated age encouraging the children to predict what they think the number will be? Asking other children who thinks the number will be higher? Who thinks it will be lower? The children may need to use skills such as team work to wrap the tape/string around the tree, providing authentic learning experiences for the children covering a multitude of skills ranging from counting, measuring, estimating, pattern identification. Children may want to measure the tree independently but are unable to reach around, to support the curiosity the practitioner could offer to hold one end of the tape or suggest the child ask a friend for help encouraging teamwork and cooperation. To further the investigation and learning practitioners could encourage the children to compare their findings, measuring around a tree that has been cut down, then counting the rings to see if there is a similar result.

(Education.com
2022)



The children could also explore trees and how they grow observing the full-grown trees and the saplings that have been planted to replace diseased trees that were removed discussing and finding what they need to grow, what the different parts of the trees are and why some trees have all their leaves and why others have fallen to the ground and changed colour. This could spark an opportunity to collect leaves and sort them by colour, shape, and size.

Another activity that can be facilitated by the practitioners in this environment is identifying patterns in nature through print making. This early year's mathematical development evokes a child's mind to gain early skills needed for mathematics, where observing and discovering patterns in the world around them allows the child to begin to create an understanding of patterns and how they are created, used, and influenced many variables. Enabling practitioners can provide children with paper and crayons allowing them to explore the multitude of textures and patterns in their surroundings on various materials such as rocks, leaves, feathers, trees, logs, tyres. This can be

done by using a simple but effective technique of rubbing the crayon over the paper when it is placed on an object. This enables children to explore their surroundings, observing the patterns and shapes in their drawings. They could compare with other children the patterns they have uncovered, create a collage, and discuss their findings. Practitioners could facilitate this activity by encouraging children to predict where they think the patterns came from. Digital competency could also be incorporated into the activity by providing children with a camera to photograph the objects they have print marked which could be taken back to the classroom to further develop the pattern identification through a matching activity. Printed photographs could be left alongside the print marked rubbings to give children opportunities to study the patterns and match them. Children could be encouraged to collect any items that they print marked such as leaves, stones, and twigs to explore further. The practitioner could enable the children to observe the print markings and analyse them, discussing if some were bumpy or smooth, could they feel any ridges? Why some had stronger patterns than others, which print was clear to identify? Were there any that looked similar and why could this be? This could then initiate an activity using senses encouraging the children to feel the object that has been print marked then look at the print marking to see if they can describe why the markings present themselves the way they do. What shapes can be seen within the print markings? Are there any patterns and they identify any shapes? Are there any similarities? Not only does this activity encourage mark making, but also allows children to visualise the result of different pressures applied when mark making, explore shapes and patterns in the outdoors, and develop their fine motor skills in various forms.



(CraftInvaders,
2018)

RISK BENEFIT ASSESSMENT

Location / Activity:	Cwmmfrwdoer Primary forest school area.	Date:	30.09.22
Assessor:	Toniann Phillips	Review date:	11.11.22

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Exploring the fallen/cut down trees in the forest.	Exploring the outdoors in natural environments can reduce stress and reduce cortisol a hormone in the brain associated with stress. Allowing children free movement and exploration enjoying themselves and relax without indoor restrictions. Children will also develop the physical stamina and develop their gross motor skills from being provided opportunities for free movement.	Uneven forest environment with potential to cause slips, trips, or falls.	Practitioners and pupils.	Practitioners to assess the area on the day of visit for any specific trip hazards caused by additional fallen trees/branches and remove, if necessary, without too much disruption to the natural environment. Children to be shown the area and reminded of the natural forest environment and to take care when moving around the forest.	L

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Gathering natural materials for print making.	Giving children experiences to connect with the outdoors, exploring textures and discovering natural materials will allow them to enhance their knowledge and discover the mathematical and scientific properties found in nature.	Risk of injury from selecting items that are sharp, could sting or are heavy. Additional risk of small children eating natural items such as berries and fungi.	Pupils	Demonstrate appropriate materials for children to gather and demonstrate which natural materials may hurt or sting them. Provide children with gardening gloves to use to allow them access to materials. Demonstrate safe handling of materials and how to assess their load and if they can carry something safely, encourage to ask for help when needed. Explain to the children not to eat anything they discover and keep their fingers out of their mouths. Demonstrate and supervise handwashing for all children at the end of the activity.	M/L
Measuring the width of trees.	Children will develop skills in counting, measuring and teamwork. Children will also enhance their fine motor skills using tools to measure and wrapping string.	Injury from moving logs, strangulation risks from use of long pieces of string, cuts to fingers from tape measures.	Pupils	Practitioners remind children of safe loads and how to move items safely. Observation and assistance in moving logs with the pupils. Explaining how the string is to be used and a practitioner always supervising when the children have access to string. Use plastic tape measures apposed to metal ones to eliminate risk of cuts to fingers.	L

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Injury from collecting logs and sticks and from assembling them for den building.	Gaining construction skills using natural materials. Gaining an understanding of materials and identifying the best to use for an effective den. Communicating with their peers and working together to create an environment that is fun with open ended opportunities for imaginative play.	Logs/branches being dropped on feet. Children carrying logs could swing them and strike others. Logs could fall on top of children.	Pupils and practitioners	Practitioners to discuss with children the hazards of den building and how to keep each other safe, such as no swinging logs or throwing them. Practitioners to inspect structure stability before allowing children to enter.	M

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Exploring the outdoor environment	Fresh air and access to open space will allow from free movement improving the wellbeing of the child. Exposing children to environments that may be limited at home, giving them authentic learning experiences allowing for creativity and social interaction with their peers. Children will gain enjoyment with nature discover and learn about a wider variety of aspects of the environment around them first hand.	Slips, trips, and falls causing injuries because of uneven ground or trip hazards such as logs, branches and vines. Bumps caused by children running freely and bumping into each other or trees. The changing weather such as rain, snow ice and wind could increase the risk of slips trips or falls. Wind could cause trees to fall, weaken and break unpredictably. Children may wander away from the environment.	Pupils and practitioners	Practitioners to be aware of the environment and hazards it possesses. Ensure adults and child are wearing appropriately. Practitioners to assess overhanging tree branches and identify potential hazards responding appropriately. Regular head counts, adults assigned to key children for additional supervision, rules and expectations set out at the beginning of every session and practitioners to use a recall strategy to gather the children at a central point at any given time. Weather to be assessed and whether the benefits outweigh the risk, ensuring children are dressed appropriately. Give children boundaries and demonstrate how far they can explore.	L

Part 4- Word Count 1933

Outdoor play is essential for children's development and growth. Frobel's theory discusses that children are curious, active, creative learners who learn best through authentic first-hand experiences and opportunities to problem solve and that the outdoor environment gives optimum opportunities for this. Access to the outdoors allows children free movement and exploration and begin to understand nature and how to respect it (Tovey, no date.) Similarly, Ouvry and Furtado (2020) discuss that children learn through reliving their experiences and using outdoor space allows them to explore and learn using movement the most natural way for a child. Movement is less constricted in an outdoor environment allowing children the space needed to express themselves and discover and explore their surroundings, compared to the constraints of a classroom where free movement is limited by space and safety requirements set out by the adults (Tovey, 2012).

Previously the curriculum has focused on specific targets and taken a closed approach to learning where most of the learning has been classroom based, however in Wales steps have been taken to allowing a more open, curious way for children to learn. The New Curriculum for Wales has taken consideration into the importance of children learning through play and that children need to have outdoor authentic learning experiences and has incorporated the importance into the way the new curriculum has been designed. Settings design and plan their curriculum bespoke to their setting following progression step guidelines. When settings are designing and planning for science and mathematics and all areas of learning, they should consider learning to be delivered through practical and active experiences, developing the knowledge and skills through engaging real-life experiences (Welsh Government, 2022).

Halpenny and Pettersen, (2013) discuss that children are witnessed to explore and discover in line with Piaget's theory explaining that children are 'little scientists due to their ability to gain new understanding by constructing experiments to understand their surroundings. Children are observed to be using their experiences to draw conclusions and learn through the medium of play, for example an infant may drop something, causing the adult to react, they will continue to drop the item numerous times to gain the same reaction therefore learning cause and effect. However, in hindsight theorist

Vygotsky discusses that the role of the adult is key to aiding learning and without the adult the child would not conduct the experiment as there is no effect from the cause where the adult reacts. Vygotsky does however agree that children construct their learning but the role of the adult to aid the learning is crucial, (Halpenny and Pettersen, 2013) (Cremin *et al*, 2015).

Considering these theories, early years practitioners have a key role supporting children and their develop, by providing stimulating environments. Vygotsky highlights social interaction enhances learning where children extend their thinking through discussion and experiences with more knowledgeable others such as the adult or their peers. By providing children with an outdoor learning environment, practitioners are promoting active social learning, key to the development of the skills for early scientific enquiry. The outdoor environment provides children with space, no noise restrictions, and an ideal space to observe, explore, discover, and experiment allowing for curiosity, (Sargent, 2015).

Moreover, Campbell and Speldewinde, (2021) and Davies and Davies, (2014) suggests that children have a natural attraction for the outdoors and use of the outdoors can be enhanced to enable a sense of wonder and delight to develop. Outdoor environments such as parks, fields, forests enable the child to play and explore nature rather than playing in nature. Practitioners who identify the importance of outdoor play and its benefits of promoting the early scientific and mathematical skills to develop can facilitate and support the outdoor learning. The outdoor environment within the chosen photo offers affordance in which children can use to develop their understanding of maths and science experimenting using their personal characteristics enabling this learning to occur. Waller *et al*, (2017) discuss Gibbon's theory of affordance where an adult may explore the chosen photo and consider what is there such as logs stacked up, saplings growing, tyre on a bench. However, a child may see this space and consider space to climb, stomp, and roll. As an enabling adult practitioners can provide children with enabling environments to give room for exploration, create experiences and take risks. The chosen picture allows for space to allow children the space to move freely. Early Years Educator, (2016) discuss that observing how children interact with the affordance of a chosen environment allows forward planning and how to incorporate science and maths into the play to enhance

the learning further. Within the chosen picture there are many items considered loose parts which are items that have open ended opportunities for exploration and play. These materials have no set way to be used and the more varied these items are the more a child can create, imagine, and experiment. They can be and do whatever the child desires them to. Nicholson's theory surrounding loose parts suggests that these objects are those with no defined purpose, are interesting things with more than one way and can be used in any way. Often these are random bits, pieces, materials, sticks and stones allowing children to be creative inviting conversations and interactions, where children can move, control and change to purpose of the object to suit their exploration resulting in infinite opportunities to play and discover (Daly, and Beloglovsky, 2015).

As practitioners within the early years the ability to look at something and recognise there is more than one area of interest and use can aide the development mathematics and science. This is what an exciting science environment looks like for the use of play to discover scientific and mathematical concepts and for child development. The environment allows for free movement where opportunities can be seen for movement and balance activities to take place. This sense of movement is known as Vestibular sense and can be enhanced within the environment through the loose parts available such as a tyre for rolling inside and logs for balancing upon (The Motor Story, no date). By moving and doing the child is learning about their body, scientific forces that allow for movement which can then aide mathematical and scientific concepts such as climbing where height and estimation of distance is involved, stepping forwards and backwards utilising addition and subtraction. Children who are free to jump, roll, push and pull, construct are using scientific concepts to discover cause and effect and experiment these concepts and apply them throughout their day (Tunnicliffe, 2015).

Practitioners who are enthusiastic and proactive about the learning of scientific and mathematical concepts within the outdoors can enhance the experience by providing additional resources to further the curiosity of the child, for example a child has noticed that the natural materials have varying textures and patterns. The introduction of a print making rubbing activity highlights and enhances the patterns allowing children to reflect upon their findings and compare materials noticing any shapes and patterns. Practitioners can use metacognitive talk where they observe a child and an interest

they have taken and evoke curiosity through questioning. How fast will it go if we....? How does it feel when? I wonder... Exposing children's minds to thought provoking conversations encourage a child to think in a metacognitive way enabling them to plan, monitor and evaluate and make changes to explore cause and effect (Degotardi, and Torr, 2007). To support this the practitioner can adopt a sustained shared thinking approach, a concept where the adult is contributing to the thinking and pre-existing ideas of the child. Identifying their discovery and asking questions to further explore their ideas and validating their findings and consolidating their learning using phrases such as what if? Do you think? That is an interesting idea? Have you tried? Summarising what the child has experienced by discussing what they have done and asking how to move forward allows for reflection and further opportunities to learn (Siraj, Kingston, and Melhuish, 2015).

This inquiry-based way of thinking supports scientific and mathematical development and how children learn concepts. An enabling adult offers opportunities of affording children's opportunities to participate in experiences that are play base and child centred. This approach falls inline with Reggio Emilia Approach where the child is decides what they are learning and for how long, choosing their own pathways of learning, engaging in activities that they have chosen to investigate will allow the child to remain actively engaged compared to if they activity was presented to them by an adult (Brunton and Thornton, 2010). Early years practitioners can support children's understanding of science and mathematics in the outdoors firstly by observing. The chosen outdoor environment shown to be an ideal environment for developing these concepts can be introduced to the children and the practitioner observes how the child interacts with the environment in line with the Reggio Emilia approach where observation is to gather information by looking and listening to the children being curious about their exploration choices. Observation informs practitioners on what they can do to enhance the learning further, where observation uncovers a particular interest practitioners can introduce additional resources to develop that learning further. Observation can also inform practitioners on areas that need improvement, witnessing a skill a child hasn't developed allowing the setting to plan to provide experiences to aid the development (Cadwell, 1997).

Observation is key within the early years; However, evidence needs to be gathered to assess learners and monitor their levels of progression. In line with the new curriculum for Wales assessment is taken place through progression steps, where the learner is at the centre of the assessment. The new curriculum for Wales aims for all learners to become ambitious and capable, healthy, and confident, enterprising, and creative and ethically informed. This was of assessment is on a continuum aimed at age 3 to 16 and states that learners should be active contributors to their learning process. Assessment will be ongoing and at an individual level using progression steps where every child will progress at a pace appropriate to them. Observations documenting science and mathematics alongside all other areas of learning can be through photographs, videos, drawings, adult observation notes. These are most effective over a period where observations are documented before, during and after learning. This is done to inform teaching to ensure the content of education is suitable, meaningful, and relevant to the child. It is also to inform parents and children, giving realistic goals from progression. There are barriers to outdoor learning and a common barrier is safety, adults are aware of the benefits of risky play however the safety of the child is of concern when accessing play. To minimise the risk and observe the benefits a risk benefit assessment can be carried out and shared with all practitioners beforehand reducing the anxiety risk may cause practitioners and to empower them to a positive mindset surrounding the benefits of the environment. Contributing to this is the lack of training for the practitioners, how to deliver meaningful outdoor experiences that resulted in an educational experience not only for the development of the children but justified for accountability requirements of the curriculum (Bilton 2020) (Waller *et al*, 2017). Professional learning can support the development of mathematics and science in outdoors, such as attending courses and reading articles and books that outline how practitioners can support learning outdoors (Keith 2017). In conclusion, practitioners are crucial to supporting and encouraging children to engage with science and mathematics in the outdoors, allowing them to evoke curiosity in an open-ended engaging way to develop and expand their learning.

Reference list

Bilton, H. (2020) Values stop play? Teachers' attitudes to the early years outdoor environment. *Early Child Development and Care*, 190 (1). pp. 12-20. DOI:<https://doi.org/10.1080/03004430.2019.1653548>.

Brunton, P. and Thornton, L. (2010) *Bringing the Reggio approach to your early years practice 2nd ed*. London: Routledge.

Cadwell, L.B. (1997) *Bringing Reggio Emilia home: an innovative approach to early childhood education*. New York: Teachers College Press.

Campell, C. and Speldewinde, C. (2021) *Science Learning Through the Environment*. Cambridge: Cambridge University Press. Available at: [Kortext Reader \(uwtsd.ac.uk\)](https://www.uwtsd.ac.uk/kortext-reader). (Accessed on: 29 September 2022).

Craft invaders. (2018) *10 Free Outdoor Activities to Encourage Kids Outside*. Available at: [10 Free Outdoor Activities to Encourage Kids Outside • Craft Invaders](#). (Accessed on: 25 September 2022).

Cremin, T et al. (2015) 'Creative Little Scientists: exploring pedagogical synergies between inquiry based and creative approaches in Early Years science', *Education 3-13*, DOI:10.1080/03004279.2015.1020655

Daly, L, and Beloglovsky, M. (2014) *Loose Parts: Inspiring Play in Young Children*. Redleaf Press, St Paul, MN. Available at: <https://ebookcentral.proquest.com/lib/trinity/detail.action?docID=1725438>. (Accessed on: 2 October 2022).

Davies, D. and Davies, D. (2014) *Teaching science and technology in the early years (3-7)*. 2nd ed. Oxford: Routledge. DOI:10.4324/9781315777771.

Degotardi, S. and Torr, J. (2007) *A longitudinal investigation of mothers' mind-related talk to their 12- to 24-month-old infants*, *Early child development and care*, Available at: <https://doi.org/10.1080/03004430701379280>. (Accessed on: 1 October 2022).

Early Years Educator, (2016). *Possibilities on offer*. Available at: [Possibilities on offer | Early Years Educator](#). (Accessed on: 1 October 2022).

Education.com. (2022) *How old is that tree?* Available at: [Image of tape measure How Old is That Tree? | Activity | Education.com.](#) (Accessed on: 25 September 2022).

Halpenny, A and Pettersen, J. (2013) *Introducing Piaget: A Guide for Practitioners and Students in Early Years Education*. Oxford: Routledge.

Keith, L. (2017) *Developing Young Children's Mathematical Learning Outdoors*. London: Routledge.

Ouvry, M. and Furtado, A. (2020). *Exercising muscles and minds: outdoor play and the early years curriculum (Second edition.)*. Islington: Jessica Kingsley Publishers.

Phillips, T. (2022) Own photo

Sargent, M. (2015) *Developing Early Science Skills Outdoors*. Luton: Mark Allen Group.

Siraj, I. Kingston, D. and Melhuish, E.C. (2015) *Assessing quality in early childhood education and care: Sustained Shared Thinking and Emotional Well-being (SSTEWS) Scale for 2-5 Year-olds provision*. London: IOE Press.

The Motor Story, (no date) *The Vestibular System*. Available at: [The Vestibular System – The Motor Story](#). (Accessed on: 30 September 2022).

Tovey, H. (no date.) *Outdoor Play and Exploration*. Available at: [Layout 1 \(uwtisd.ac.uk\)](#). (Accessed on: 28 September 2022).

Tovey, H. (2012) *Bringing the Froebel approach to your early years practice*. Oxford: Routledge.

Tunnicliffe, S.D. (2015) *Starting inquiry based science in the early years : look, talk, think and do*. London: Routledge.

Waller, T. et al. (2017) *The SAGE handbook of outdoor play and learning*. Edited by J. Bowen. London: SAGE Publications Ltd.

Weebly, (no date) *Ring-a-ling*. Available at: [Telling a Tree's Age from the cut stump \(weebly.com\)](#). (Accessed on: 25 September 2022).

Welsh Government. (2022) *Curriculum for Wales*. Available at: [Curriculum for Wales - Hwb \(gov.wales\)](#). (Accessed on: 30 September 2022).

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