



Syndod a Rhyfeddod-
gwyddoniaeth, mathemateg a'r
awyr agored.
Awe and Wonder- science,
mathematics and the outdoors.

(Pinterest, Date unknown)

Through various research and studies the outdoor environment is one of significance importance towards children's development through the early years; it has been studied that natural environment provide a more varied and nourishing opportunities for self-education, physical skills and sensory integration which is critical for a holistic development of a child (Steiner. 1909). Outdoor play also enhances brain maturity at a considerably faster rate than those who play indoors which leads to more advanced children with greater language and social skills (Burdette and Whittaker.2005).

Through studying the chosen picture in section 1 of this portfolio there are various key features which can be used by children to develop specific scientific and mathematical concepts; one key feature is sticks/logs. These create open-ended play and learning in which they can be reused and repurposed on various occasions which links with Froebel's study on wholeness and connectedness in which children succeed through living and learning with nature with open-ended play (Froebel cited in Brosterman; 1997). This simple yet effective feature provides various mathematical and scientific opportunities for children, examples of this is through using the sticks and logs children begin to understand biology through the circle of life in which how trees grow, where sticks come from, the bark, texture and how it produces oxygen all of which are known as earth science. Children begin to understand the world they live in and how it works; essentially a feature where they can experience, experiment and be exposed to the natural world (Waller,2007). Children can count the sticks-adding and taking away. Children begin to understand size, how some sticks are taller than others and some are wider this follows play affordance with sticks and logs allowing children freedom and choice with various options and use of a singular object; child led (Early Years Education,2016). They can begin to question why that is and what shapes and colours are on the logs. They can roll the logs to understand how speed works and by carrying and moving the logs they begin to understand weight and how not everything weights the same this helps them understand their own limitations this also links with a child's transportation schema and the

importance of movements in the early years with children having the opportunity move themselves and other objects and parts around which help build the body and the brain (Robinson,2012). Children may try balancing on the logs which can help them understand their own biology of their body, for example, why they put their arms out to balance as well as knowing and understanding what maybe too risky to try and what is safe. All of these activities link with Gibson and the affordance theory in which perception drives action, a great example would be that in this instance a stick can be multiple things to a child and that the world is perceived not only in the object itself and the spiral relationship but also the possibilities of action that follow (Gibson,1986). With the various activities sticks can create it allows children to experiment, children and adults draw on past gained experience to problem solve. The younger the child may be the less experience they have; with that the more opportunities that child may have to experiment with freedom it allows them to develop and learn without any feeling of failure (Welsh Government, 2008).

The second notable feature is uneven ground within the picture. This provides children with great opportunities to learn and discover added that children are provided with suitable footwear for outdoor use with these interesting and diverse landscape with different surfaces, gradient and features. Uneven ground links highly with the vestibular organs, which is the first sensory system to develop in the womb; it sorts and relays incoming sensory information from other organs to the brain allowing children to walk, run, balance, improve visual tracking and develop and maintain good muscles (NHS,2022). This is simulated through movement, in which movements activate the brain for further learning, and helps build the brain through a creation of nerve networks (Mackyntire and McVitty,2004). Linking with this is the importance of movement not only for the vestibular system (The Motor Story,2022) but also for holistic learning to naturally happen in which children develop physically, learn their limitations, self-awareness and communication skills, in addition to this it also improves academic performance and behaviour with it aiding mental and social health whilst underlaying the foundation for attitudes and interests for life (McMillan,1930) this all links with children developing scientific concepts as they begin to understand their body through biology and how different grounds they walk on have different surfaces and textures this then enables children to feel forces, this links with the large emphasis on children learning through doing and being active (Dewey,1897). Through movement children also understand speed, of themselves and others around them by running and rolling (White,2014). This reinforces the statutory framework of the Early Years Foundation stage (2012) with its emphasis on the importance of early development and the needs of the children to have a 'diet of movement' with rich holistic experiences which aid all types of learning. To incorporate further

mathematical and scientific concepts adults could add loose parts such as pinecones and shells for children to use within their open-ended play to count, to compare sizes and shapes, width. Furthermore, adults whilst supervising could add tubs water for children to place on the uneven ground to see the water sway and tilt. Children could pore the water to watch the speed in which it runs, what way it runs all of which link with speed, gravity as well as natural elements of the earth (Welsh Government,2022). The second feature highlights how allowing children to become aware of their own bodies and the world we live in even in the simplest ways allows children to develop further whilst also further enhancing their curiosity through communicating new ideas and thoughts among others by educating through nature (Pestalozzi,1780).

The third feature which can be used by children to develop mathematical or scientific concepts as seen in the picture of section 1 is natural resources. As seen within the picture there are trees overlooking the outdoor area which include bushes with flowers and bark which can be seen on the floor. Evidence shown in studies show children enjoy interacting with various materials through textures, smells and other physical phenomena's. (Nicholson,1971). These natural resources can be used in various ways such as scientifically learning about the circle of life through children watching and collecting the fallen leaves and plants; children can then come to understand the colours of the leaves each season and how they change shape (Froebel,1832). Mathematically, children can collect and count the fallen leaves and plants which can link to children's use of role play which according to Susan Issacs is extremely beneficial to young children (Pound,2005+ Mickleburgh,2007) and Gibson's affordance theory where there are multiple uses/opportunities for one tool or resource with their use of imagination where children then could use the leaves as things like money, food, blankets all of which have mathematical skills such as counting, subtracting as well as counting money. These natural forms of learning have a positive role within education (Rousseau,1745); whether it is correct or incorrect children begin to lay down the foundation of their own learning this is known as the trial and improve approach; this allows learners to develop a variety of skills as well as resilience through understanding the benefit of things such as failure. This allows children to discover and trial various methods whilst regulating independent and shared thinking, exploration and investigation skills as well as problem solving(Welsh Government- New Curriculum,2022) the bark and flowers can be used by children within other natural resources such as water to see if they float/sink or in mud as tools such as shovels; commonly mathematical problems take the use of creativity to explore various methods as well as allowing children to use their critical thinking by introducing this all four purposes will supported. The Welsh Government's new curriculum 2022 also highlights the importance of outdoor

environments which are rich with a range of resources to facilitate first hand experiences. “By allowing learning to take place outdoors with fun and games to take place indoors, the distinction between education and recreation begin to disappear.” Simon Nicholson, 1971.

RISK BENEFIT ASSESSMENT

Location / Activity:	In the facilities outdoor space- in the picture	Date:	22/03/2022
Assessor:	Shauna Thomas	Review date:	22/03/2022

The boxes in the table below will expand as you type into them; pre-entered text is simply for illustration. You should delete irrelevant items and replace with text relevant to your circumstances.

Your overall risk rating – Low, medium or high – is based on your judgement about whether the BENEFITS of the activity or opportunity outweigh the RISKS.

ACTIVITY	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
ACTIVITY	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

Mud kitchen- Loose parts	Loose parts can be great tools for children using their imagination and role play individually or within a group. It can provide children opportunities to incorporate their schemas such as transportation through being able to move these loose parts around the garden and adding or removing anything they deem necessary. These loose parts can offer children the mathematical ability to measure things such as soil and water, add or divide other loose parts as well as simple skills, such as counting whilst adding or removing properties from within the kitchen. These lose parts also add a scientific element to children's learning as they are learning through mixing different components how the texture, colour and the added components change, by adding less and more or certain components. Loose parts aid children in	Although the overall risks of loose parts are not overly high there are still risks that can follow from such open ended play such as choking- especially within younger children they follow a tendency of exploring through their mouth- taste, texture; this can create a choking hazard as some loose parts can be small and easier to become lodged and even with larger loose parts they can break off into smaller parts which a child can then choke on. Another hazard or risk can be children who throw or being accidentally hit with a loose part, as children use their imagination within the play or even through rough play	Children	There are precautions that can be taken to reduce the risk of injury in this instance. Firstly, the risk of choking can be reduced through age appropriate loose tools, ensuring smaller children who have a tendency of putting parts in their mouth have no reach of smaller tools which can cause choking and that all tools are checked prior to the children using them to ensure no loose materials are broken or missing parts and if so that they are removed from the area. Being aware of children with such tendencies of putting things in their mouths to ensure they are being always observed to avoid choking. With older children, although the risk does reduce naturally as they begin to understand natural dangers themselves, a member of staff can additionally explain the dangers of choking so that they have a greater understanding and respect. In regard to children's use of loose tools to hit or throw there is little that is able to be done to reduce this risk although again by staff explaining that the tools can hurt and that they are not to be thrown it can bring a realisation to children to use the tools in a kinder manner although this may not fully eliminate this risk ensuring observers are within the area that can aid and redirect.	Low
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	developing critical and creative thinking using imagination and experimentation.	there is a possibility that the loose parts could be used as a tool to hit or throw which could injure the observer or a child.			
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Sticks/logs	Natural tools such as sticks provides open ended play with no set plan of what is or isn't right which allows children to use their imagination and creativity. This also includes sensory exploration as children begin to understand textures, colours, smells. With natural tools such as sticks creating open ended play for children this includes resourcefulness with regards to the children's ability to recycle and repurpose sticks and logs in different types play which can link to children's problem-solving skills and their environmental resources through learning about the natural tool and learning to respect it. It can also enhance mathematical and scientific skills such as sizes, shapes, width.	Hazards and risk that can come from this include children using the tools to hit or throw which can lead to bumps, grazes and splinters.	Children	Firstly, to reduce the risk of children using the sticks or logs in a manner which could injure other children or themselves ensuring that there is a or that there are observers in the area to be able to aid and redirect any kind of negative harmful play that could happen. But by also explaining to children the possible dangerous of using the sticks allows them to understand and respect the nature and the use of the sticks and those around them. With the larger logs and sticks by moving them into a more open area avoiding other play areas it ensures there is enough room for every child to play and use the environment as they wish safely whilst reducing the risk of children being accidentally injured.	Medium
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Baskets	The baskets shown in the picture will have great benefits for young children as again these can be used for open ended play as they can be moved around and repurposed as different learning and development opportunities such as climbing in and out, stacking and building, for transporting other items and imaginative play. The baskets shown in the picture are recycled items which provide children with a greater understanding of reusing and recycling items. These baskets can be used in all types of weather and can be used individually and as groups.	Although the hazards and risks are low within this activity as the play is open-ended various things can happen- through stacking these baskets they could fall causing bumps on children. Children who could be jumping through the baskets may trip and graze/bruise their knee as well as the basket itself snapping and becoming sharp .	children	Precautions to take to reduce the risk of injury includes adults to observe and aid the children at any time with this if the baskets become too tall the adult can step in and explain to the children the risk now created and give them options which develops problem solving skills to reduce the risk or the adult to reduce the risk by removing the baskets from the stack. Although adults cannot prevent children from tripping as they use the baskets by observing if any injury does occur it can be treated affectively immediately but by checking the baskets do not have any items such as blankets to cause a child to slip can reduce the risk; this can also link to children wearing appropriate footwear outdoors. With regards to the basket snapping if at any point a basket snaps or becomes sharp the adult should remove the basket immediately from the children and to do regular checks on the outdoor tools and equipment for any damage or brakes to reduce risk of danger.	Low

Through this portfolio there has been clear links made to an outdoor environment promoting and supporting children's scientific and mathematical development and thinking, although to achieve this the adults involved play a key role in these environments among children.

The role of the adult is one of substantial values and is the foundation to promote and support children's development through the early years; the added complexity that is within the early years is that for early years practitioners the support children in a variety of environments they must need a pedagogy knowledge (Bilton,2014). Recent studies show that personal experiences individuals experience within their families impact outdoor education, this is supported by a study completed by Waite, 2011 in which led her to call for 'a reawakening of value-based pedagogies' with the way we behave reflecting our inner values. The lesser opportunities children have now, once they become adults or even teachers the lesser experience of outdoor learning, they will have which will inevitably demise the early years teaching and learning environments (Palmer, 1997) indicating 'we are who we teach'. This leads to the clear importance of the correct training, positive and varied outdoor opportunities for they themselves to gain knowledge, experience and confidence in the outdoors. For practitioners of the early years to be able to provide children with a holistic education provision (Welsh Government,2015) following the regulations for practitioners in Wales through the Curriculum for Foundation Phase by the Welsh Government,2015 the guidance follows the vital importance that practitioners' involvement have within these environments which can be notably through open questioning including shared and sustained thinking. These allows active thinking to take place which enhances and extends children's development. Through following this guidance, it also supports that all children are provided with an education that can develop their personality and their talent fully by allowing child led play, a varied environment and risky play (Rights to Action, 2004). Following the new curriculum in Wales the role of the adults is to provide opportunities for the children to develop holistically whilst also developing an holistic picture of the learner themselves with no judgement. It is added science and mathematics are apart of the broader 4 purposes in which practitioners should gather information, question, plan, implement and further evaluate through this the practitioner is able to see added opportunities such as noticing a child's personal schemas and being able to support that child and their schema further through adding and adapting activities or environments to fit the child. The new Welsh Curriculum 2022 also adds adults should engage in sustained shared thinking through supporting children to allow them to analyse and reevaluate they can do this through re-experimenting and aiding them in thinking further through questions and providing various ideas to them allowing them to readjust and examine the task of environment(Blatchford,2010) and metacognitive

talk (Pestalozzi,1774) through asking who, what, where, when and why questions(Blatchford,2010) to be able to further support and recognise children's understanding whilst additionally assessing children's learning individually and within groups in a variety of different environments. The importance of assessing a child is simple to improve children's learning through the content and delivery of education and to be able to meet the accountability requirements of the curriculum. Assessments are purposely done to support the progression of each individual within the early years and further although the Legislation Curriculum and Assessments Act 2021 highlights that the child should be at heart and supported whilst in the active learning process with assessments being an on-going process which is identical and cannot be identified as anything other than learning and teaching with practitioners having a great understanding of the progression developed through a professional dialogue which is integral within the curriculum design whilst also allowing the practitioners to reflect on previous activities and learning to improve and adapt to support children further; methods of assessments can range across the curriculum ensuring an holistic picture is built within the learners development. Through various assessments it also builds an engagement between the learner, parents/guardians as well as the practitioner which is essential for the learner to progress further within their development. Furthermore, the role of the adult is to understand and support STEM- Science, Technology, Engineering and Mathematics which are valuable elements of early childhood education (Clements & Samara, 2016). Despite common misconceptions science and technology are used and are vital to a child's daily life' an example of this is building towers with blocks and watching them fall which children often do as young as toddlers. For adults to support STEM they do not need expensive materials, it has been widely studied and showed the benefits of children and natural tools and materials such as twigs, leaves, buttons and other everyday items (Casey et al 2016) these can be found in almost every environment. These natural materials spoken of are known as loose parts (Nicholson,1972) which can spark creativity and exploration. These loose parts link with science, engineering, technology and mathematics as they variable items which can be used and explored differently by each child following their interests and talents. Examples of how loose parts can be used positively and appropriately is through their endless ways of usages to allow children to improve their problem-solving skills, creativity, concentration, hand-eye coordination, fine and gross motor skills, language and vocabulary skills as well as enhancing science and mathematical thinking. These loose parts are effective for young children as they can be moved frequently, designed, incorporated and separated allowing children to play and learn freely. The way an adult would support the usages of loose parts would be through exploration and experimentation, using critical thinking to see

what the children enjoyed and showed interest to and what didn't work so well as each child is different and through this the practitioner is able view the children as holistic learners. Using outdoor environments where the children find their own loose parts where they are natural is a positive way of introducing loose parts and observing what the children have an interest in whilst also exploring and learning in the outdoors (Flannagan,2018). Through the introduction and use of loose parts this provides a large various opportunity for children in the early years as well as creating meaningful conversations and allows a fostered mutual respect to be created (Smith-Gilman,2018). The use of loose parts will provide great valuable experiences that children will want to re-create in the future; the practitioners involved can manipulate loose tools to design a learning process as well as encourage students' involvement with the learning, the use of this allows natural critical thinking and problem solving to happen as well as allowing the process of teaching children values, emotions, ideas and discovery (Smith-Gilman,2018). This application of loose tools also brings opportunities for children with complexities enhancing their creativity in a more natural form (Maxwell, Mitchell and Evans,2008). The usage loose tools can allow practitioners to see, listen, feel and think what each child is experiencing allowing the practitioner to gain a deeper understanding of the holistic learners through observation skills (Sutton,2011). This then leads both the practitioner and the learner to a more meaningful learning with advanced thinking (Gull, Bogunovich, Goldstein, Rosengarten 2019). The role of the adult is to follow ideas of the children rather than forcing children which is known as child-led; this is critical in good practice (Sawyer,2006). This links with the idea in which the more freedom offered to children regarding outdoor play or interactions with loose parts the more opportunities in which follow to enhance children's development (Altun, 2017, Monhard and Monhardt, 2006, Padilla, 1990). This freedom offered to children with regards to loose parts and outdoor play builds authentic positive and interesting mathematical, scientific, technological learning which encourage furthermore in-depth learning and development with the usage of open ended child-led play which practitioners are able to link with Bruner and the affordance theory (Gibson,1966).

These methods are closely linked with various theories in which the practitioner's role is highlighted throughout. The Reggio Emilia approach follows children through open-ended play where learning is driven through the child as children are viewed as curious learners in which the image of the child is central to the philosophy. Similarly, to Welsh guidelines children are viewed as strong and intelligent rather than someone with needs which must be fulfilled this allows practitioners to further view children as holistic learners with unlimited potential. This allows children

to co-construct their own learning whilst allowing the practitioner to plan and adapt the learning based on the interests of the child with the natural environment being a third teacher to the child (Reggio Emilia, 1963). Equally as relevant to the role of the adult is the Montessori method which is also known as being a child-led method in which children are put into learning environments but can freely choose what activities they would like to do, allowing them to make their own choices and develop at their own pace by using natural open-ended materials. The theory follows a holistic approach with the aims that children can further develop physically, socially, emotionally and cognitively through exploring the world and learning through play. This theory highlights the importance of practitioners being highly trained and qualified to observe and encourage through guiding children and observing as children have the highest capacity to learn during the early years. Again Steiner, 1912 founded an anthroposophical society in which humans perceive the spiritual world through enhanced consciousness this is achieved through open-ended new experiences with inclusivity for all children which is known as a holistic approach emphasised by practitioners following the new Welsh curriculum 2022. Froebelian nurseries teach a philosophy in which children are to be nurtured to grow in which they develop skills freely from early years. These skills are developed through play with practitioners providing opportunities and materials. These theories listed all follow similar method in which the practitioner focuses on what the child can do rather than what the child cannot which links with constructivists such as Piaget, Vygotsky and Bruner who believe that we as individuals construct our own knowledge through active learning. Helen Tovey (2016) lists within the Froebel pamphlet key principles within the early years practitioners is allowing freedom with guidance, allowing staff to ask open-ended questions that inspire children further and support each child's uniqueness in which the whole child is included including family, friends, beliefs, community and their culture. This also includes allowing children to engage with nature and take part in independent activities such as using loose tools- allowing staff to encourage children to reflect on their learning and experiences with play being central and key to each child's development, ensuring practitioners are flexible and able decision makers who can adapt and show confidence. Practitioners' role is listed lastly within forest schools with it being a learning programme that focuses on holistic development and the child being the holistic learner; with forest schools being child-led this allows practitioners to observe and encourage children to explore, discover and taking risks (Scandinavia, 1950, United Kingdom, 1990). These theories allow children to discover and develop through play which supports scientific and mathematical thinking through experimenting in the outdoors, children can develop skills such as numeracy skills and numerical reasoning, number skills, measuring skills, data

skills (National Literacy Skills and Numeracy Framework, 2008). These provide significant evidence of the role of the adult in support of mathematical and scientific thinking within the outdoors through focusing on various frameworks, research and theories.

Reference list

Adran, Y. and Oes, G. (2009). *Foundation Phase Outdoor Learning Handbook*. [online] Available at: <https://hwb.gov.wales/storage/fcb8539c-9be7-4883-8542-35d7b54b56f2/foundation-phase-outdoor-learning-handbook.pdf> [Accessed 23 Mar. 2022].

And Hartlepool, N.N.T. (2022). *Balance and Dizziness*. [online] North Tees and Hartlepool NHS Foundation Trust. Available at: <https://www.nth.nhs.uk/services/audiology/balance-and-dizziness/> [Accessed 25 Mar. 2022].

Arlemalm-Hasger, E. and Elliot, S. (2021). *Outdoor Play and Learning in Early Childhood Education*. [online] obo. Available at: <https://www.oxfordbibliographies.com/view/document/obo-9780199756810/obo-9780199756810-0273.xml> [Accessed 23 Mar. 2022].

Berg (2020). *The Reggio Emilia approach to early years education*. [online] Daynurseries.co.uk. Available at: <https://www.daynurseries.co.uk/advice/the-reggio-emilia-approach-to-early-years-education> [Accessed 24 Mar. 2022].

berg (2020). *The Montessori method of education: A child-led approach*. [online] Daynurseries.co.uk. Available at: <https://www.daynurseries.co.uk/advice/the-montessori-method-of-education-a-child-led-approach> [Accessed 24 Mar. 2022].

Bilton, H. (2019). Values Stop play? Teachers' Attitudes to the Early Years Outdoor Environment. *Early Child Development and Care*, pp.1–9.

Brooker, E., Blaise, M. and Edwards, S. (2014). *SAGE Handbook of Play and Learning in Early Childhood*. [online] Google Books. SAGE. Available at:

https://books.google.co.uk/books?hl=en&lr=&id=ztfSAwAAQBAJ&oi=fnd&pg=PA169&dq=pestalozzi+metacognitive+approach&ots=6HYjpcn14Q&sig=-q5n0_hEI35b1zPOH7Q51pVmyi4#v=onepage&q&f=false [Accessed 25 Mar. 2022].

Campbell, C. and Speldewinde, C. (2020). Affordances for Science Learning in “Bush Kinders.” *International Journal of Innovation in Science and Mathematics Education*, 28(3).

Day, B.L. and Fitzpatrick, R.C. (2005). The vestibular system. *Current Biology*, 15(15), pp.R583–R586.

De Bruycker, J. (2015). *THE OUTDOOR CURRICULUM IN STEINER EDUCATION*. [online] Available at: https://pyrites.org/files/9714/7681/7400/The_Outdoor_Curriculum_in_Steiner_Education.2015.06.01_WESTT_pdf.pdf [Accessed 20 Mar. 2022].

England, L. (n.d.). *loose tools in outdoor play*. Pinterest. Available at: <https://www.pinterest.co.uk/pin/228979962296674293/> [Accessed 20 Mar. 2022].

Government, W. (2013a). *Mathematics and Numeracy: Designing Your Curriculum - Hwb*. [online] hwb.gov.wales. Available at: <https://hwb.gov.wales/curriculum-for-wales/mathematics-and-numeracy/designing-your-curriculum> [Accessed 24 Mar. 2022].

Government, W. (2013b). *Science and Technology: Designing Your Curriculum - Hwb*. [online] hwb.gov.wales. Available at: <https://hwb.gov.wales/curriculum-for-wales/science-and-technology/designing-your-curriculum/> [Accessed 25 Mar. 2022].

Government, W. (2014). *Further steps outdoors Guidance*. [online] Available at: <https://hwb.gov.wales/storage/37952a30-6aa6-4a64-be8c-6710dbd25d8c/further-steps-outdoors.pdf> [Accessed 23 Mar. 2022].

Hamid, K. (2018). *The Psychological Theories Behind Learning Through Play*. [online] Pentagon Play. Available at: <https://www.pentagonplay.co.uk/news-and-info/psychology-learning-through-play> [Accessed 23 Mar. 2022].

House, R. (2013). *Too Much Too Soon?: Early learning and the erosion of childhood*. [online] Google Books. Hawthorn Press. Available at: https://books.google.co.uk/books?hl=en&lr=&id=ot9gDwAAQBAJ&oi=fnd&pg=PT178&dq=steiner+outdoor+play&ots=hxoIINpKtB&sig=1k1_0sV7ykpKvFZR0HjiDdsoM4w&redir_esc=y#v=onepage&q=steiner%20outdoor%20play&f=false [Accessed 22 Mar. 2022].

Luds Kadimba (2011). *Why Is Outdoor Play Important for Children? Theorists Weigh in on Benefits*. [online] Bright Hub Education. Available at: <https://www.brighthubeducation.com/teaching-preschool/107367-theories-on-the-importance-of-outdoor-play/> [Accessed 25 Mar. 2022].

Nurseries, D. (2021a). *Forest school: a Natural Approach to Learning*. [online] Daynurseries.co.uk. Available at: <https://www.daynurseries.co.uk/advice/forest-school-a-natural-approach-to-learning> [Accessed 25 Mar. 2022].

Nurseries, D. (2021b). *What is Steiner Nurseries*. [online] Daynurseries.co.uk. Available at: <https://www.daynurseries.co.uk/advice/what-are-steiner-nurseries> [Accessed 24 Mar. 2022].

Nurseries, D. (2022). *What Are Froebelian Nurseries*. [online] Daynurseries.co.uk. Available at: <https://www.daynurseries.co.uk/advice/what-are-froebelian-nurseries> [Accessed 24 Mar. 2022].

Pound, L. (2019). *How Children Learn (New Edition)*. [online] Google Books. Andrews UK Limited. Available at: https://books.google.co.uk/books?hl=en&lr=&id=q-64DwAAQBAJ&oi=fnd&pg=PA17&dq=rousseau+and+pestalozzi+outdoor+play&ots=aOxUpLsaDe&sig=QIy-4idJCeGoheXSbuXE-nuf_kE&redir_esc=y#v=onepage&q=rousseau%20and%20pestalozzi%20outdoor%20play&f=false [Accessed 25 Mar. 2022].

Rahardjo, M.M. (2019). How to Use Loose-Parts in STEAM? Early Childhood Educators Focus Group Discussion in Indonesia. *JPUD - Jurnal Pendidikan Usia Dini*, 13(2), pp.310–326.

Scotland, P. (n.d.). *Play Scotland Loose Parts*. [online] playscotland.org. Available at: <https://www.playscotland.org/wp-content/uploads/Play-Scotland-Loose-Parts-Leaflet.pdf> [Accessed 24 Mar. 2022].

society, P. (2021). *Pestalozzi's Influence and Relevance Today*. [online] jhpestalozzi.org. Available at: <https://jhpestalozzi.org/learnmore/influenceandrelevance/> [Accessed 24 Mar. 2022].

Story, T.M. (n.d.). *Kinesthesia – the Motor Story*. [online] Themotorstory.org. Available at: <http://themotorstory.org/sensory-processing/kinesthesia/> [Accessed 25 Mar. 2022].

Story, T.M. (n.d.). *Proprioception – the Motor Story*. [online] themotorstory.org. Available at: <http://themotorstory.org/sensory-processing/proprioception/> [Accessed 23 Mar. 2022].

Story, T.M. (n.d.). *The Vestibular System – the Motor Story*. [online] themotorstory.org. Available at: <http://themotorstory.org/sensory-processing/the-vestibular-system/> [Accessed 24 Mar. 2022].

Torquati, J., Gabriel, Mary.M., Jones-Branch, J. and Leeper-Miller, J. (n.d.). *Environmental Education- A Natural Way to Nurture Children's Development and Learning*. [online] researchgate.net. Available at: https://www.researchgate.net/profile/Julia-Torquati/publication/292049296_Environmental_education_A_natural_way_to_nurture_children's_development_and_learning/links/59e73ee8a6fdcc0e882d832b/Environmental-education-A-natural-way-to-nurture-childrens-development-and-learning.pdf [Accessed 23 Mar. 2022].

Tovey, H. (n.d.). *Outdoor play and exploration*. [online] Froebel.org.uk. Available at: <https://www.froebel.org.uk/uploads/documents/FT-Outdoor-Play-Pamphlet.pdf> [Accessed 23 Mar. 2022].

Unknown (2022). *Johann Pestalozzi (1746–1827) - Career and Development of Educational Theory, Diffusion of Educational Ideas*. [online] education.stateuniversity.com. Available at: <https://education.stateuniversity.com/pages/2319/Pestalozzi-Johann-1746-1827.html> [Accessed 25 Mar. 2022].

unknown (n.d.). *Pestalozzi's First Influence in England, Ireland and Scotland*. [online] 74136823-878f-4b91-94d2-dea021f3c2c2.filesusr.com. Available at: https://74136823-878f-4b91-94d2-dae021f3c2c2.filesusr.com/ugd/c2d99a_8bb3982292264b50989fbf8175c4214a.pdf?index=true [Accessed 23 Mar. 2022].

unknown (2018). *The vestibular sense: what is it & why is it important for child development?* [online] Children inspired by yoga. Available at: <https://childreninspiredbyyoga.com/blog/2018/01/vestibular-sense-child-development/> [Accessed 24 Mar. 2022].

Waite, S. (2017). *Children Learning outside the Classroom: from Birth to Eleven*. [online] Google Books. SAGE. Available at: https://books.google.co.uk/books?hl=en&lr=&id=sPf-DQAAQBAJ&oi=fnd&pg=PA7&dq=theorists+in+outdoor+learning&ots=Xqww5VI-6_&sig=ouV_d3AyvGdTLfAdZtxJleRLPRg&redir_esc=y#v=onepage&q=theorists%20in%20outdoor%20learning&f=false [Accessed 25 Mar. 2022].

Wales, N.R. (n.d.). *Mathematics and Numeracy*. [online] can.cyfoethnaturiol.cymru. Available at: <https://cdn.cyfoethnaturiol.cymru/media/690953/maths-and-numeracy-activities-and-games-booklet-eng.pdf> [Accessed 24 Mar. 2022].

Welsh Government (2015). *Foundation Phase Framework Curriculum for Wales*. [online] Available at: <https://hwb.gov.wales/storage/d5d8e39c-b534-40cb-a3f5-7e2e126d8077/foundation-phase-framework.pdf> [Accessed 25 Mar. 2022].

White, J. (2012). *Community Playthings | Every child a mover*. [online] Communityplaythings.co.uk. Available at: <https://www.communityplaythings.co.uk/learning-library/articles/every-child-a-mover> [Accessed 24 Mar. 2022].

White, J. (2013). *Play and Learning in the outdoors*. [online] www.taylorandfrancis.com. Available at: <https://www.taylorfrancis.com/books/mono/10.4324/9780203105429/playing-learning-outdoors-jan-white> [Accessed 22 Mar. 2022].

White, R. (2004). *Young children's Relationship with nature: Its Important to children's Development & the earth's Future*. [online] researchgate.net. Available at: https://www.researchgate.net/profile/Randy-White-2/publication/251807382_Young_Children%27s_Relationship_with_Nature_Its_Importance_to_Children%27s_Development_the_Earth%27s_Future/links/545141ec0cf2bf864cba8f56/Young-Childrens-Relationship-with-Nature-Its-Importance-to-Childrens-Development-the-Earths-Future.pdf [Accessed 25 Mar. 2022].

World, N. (2022). *Enabling Environments: Outdoors - In full swing*. [online] Nursery World. Available at: <https://www.nurseryworld.co.uk/features/article/enabling-environments-outdoors-in-full-swing> [Accessed 25 Mar. 2022].