



(Source: Visit Wales, 2021)

The first feature of the woodland outdoor learning space that can be used to benefit the development of children's scientific and mathematical skills is the bridge. The bridge has a slight slope to it which could be used to look at how gravity works and how different gradients effect the speed of an object rolling down it. An activity which could be used in this setting would be a group of children rolling a ball from the top end to the bottom and seeing who's ball reaches the end of the bridge first. Groups of children could then also try and roll it from the bottom to the top. By completing the activity from both ends of the bridge the children would be able to understand how gradients and gravity work. The bridge can also provide learning in other areas such as distinguishing the difference in sound when different types of shoes walk along the bridge or what it sounds like when different materials are rolled down such as a plastic ball or a conker. Children may also be curious about the structure of the bridge and how it is able to withstand people walking across it, by looking at the structure of this they would be able to develop their mathematical and technological skills. As

explained by the Curriculum for Wales (2020) the first steps of progression in science and technology development are the ability to be curious and ask questions about how things work, the second step of the progression is being able to explore the environment whilst making observations of the surroundings. The bridge can also be used to look at what types of wildlife are living within the wood of the bridge, there may be many different types of bugs and insects which reside in the bridge and although it is a man-made bridge, children will be able to understand how structures like these an important part of the surrounding environment are not just for people but for other animals who live in the area.

Another part of the environment which promotes the development of science, similar to the bridge with exploring the wildlife is the stream which flows beneath and to the right of the bridge. Children would be able to look at what types of wildlife live within the stream and compare these to the types of wildlife that live perhaps in the bridge. The streams provide scope for children to gain a deeper understanding of the similarities and differences between mammals and amphibians. Similar to this concept, when looking at these features, the children will be able to observe and discuss the environment that aquatic animals live in and how the animals are adapted to be able to survive in said environments. Children are naturally curious and have a yearning to understand what is different to them, exploring rich woodlands that have diverse wildlife and plant life is a fantastic tool which will benefit their learning in many different areas. The stream produces great sound when the water is flowing and the sound changes when slight bends are made or there is a steep drop, the stream could therefore promote the development of expressive arts and music. A key part of the Curriculum for Wales (2019) is being able to experiment and explore expressive arts with a range of sources and materials. The stream also links in with the development of geographical skills as it provides an understanding of erosion and corrosion of the rocks that lie on the bed of the stream. An activity that could be completed with the stream would be to take a few rocks out of the stream and compare the different textures, sizes, and shapes. Some rocks may be round, small, and smooth but others may be jagged and pointy. This activity links into a well-rounded mathematical development. Another activity that children could complete is timing how long it takes for a toy boat to float to a certain point of the river, this would create links with scientific learning such as time, distance, and speed. During the activity, the children would be

able to use different materials of boats such as plastic ones or paper ones. By doing this they would be able to understand the effect that weight has on speed. There could also be some learning around how currents effect the speed of what is floating down the stream.

Another focus point of the learning environment are the trees in the area. Children would be encouraged to observe what the trees look and feel like and how some of the trees are different to others. An activity for the children could be finding different leaves that have fallen from the trees, painting the back of them, and using the leaf to create a copy of the shape of it onto a piece of paper. This activity will allow children to look at all of the different types of leaves and how they come in different shapes and sizes. The children will also be able to look at the different colours that the leaves are. From a biological point, the children will be able to learn about the life cycle of the tree and the leaves. They will also be able to gain a better understanding of how the seasons can change what the environment looks like. The age and development of the trees can be explored too, with the possibility of tree trunks being looked at and being able to work out the age of the tree by counting the rings inside. Similar to the rocks from the stream, the children will be able to compare the size of the leaves as well as looking at how many pointed edges the leaf has which can aid their mathematical skills. There may also be some wildlife that live in the trees or the branches such as birds and their nests as well as woodlice and other insects.

All three of these focus points allow for a holistic approach to learning to be achieved, with all focuses linking into multiple areas of a child's learning. The Early Years Foundation Stage framework (2021) explain that all children develop at different paces, therefore, being able to provide a holistic learning environment ensures that all aspects of a children's development are adequately supported. I believe that a woodland area such as the example shown in the photograph are fantastic areas for children and young people to learn and develop. The outdoors provides a classroom without the need for external resources to teach as there are so many different focus points which can develop many different areas of learning. As explained by theorist Fredrich Froebel, outdoor play is essential for developing young minds as well as giving children the freedom to explore new surroundings and investigate, observe and question how the world around them works (Bruce, 2015).

RISK BENEFIT ASSESSMENT

Location / Activity:	Woodland Walk at Garwnant Visitor Centre	Date:	10 th September 2021
Assessor:	Mia Darby	Review date:	10 th October 2021

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?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Rolling a plastic ball from either end of a wooden bridge.	The young people will be able to gain a deeper understanding of how gravity works and how different gradients can effect speed and motion, thus promoting the development of their scientific skills and knowledge.	- Trips and falls resulting in cuts/bruises/grazes. - Having a splinter from the wooden bridge.	Young people and staff.	- There will be a minimum of one staff member who is fully trained in first aid, there will also be a first aid box brought along to the activity to deal with any injuries. - Adequate staffing ratios to children will mean that smaller groups can be used during the activity which will reduce the risk of any accidents happening. - Children and adults will wear appropriate clothing and shoes and be warned of where slips could happen & to avoid such areas.	Low

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Retrieving rocks from the bed of the stream.	The young people will be able to compare and contrast the different sizes, shapes and textures of the rocks which can enhance their mathematical and geographical skills. This activity will also encourage curiosity and questioning into why some rocks have different textures.	▪ Young people/staff falling into the stream. ▪ Drowning in the stream. ▪ Slips and falls on the uneven surfaces around the stream. ▪ Children putting small objects into their mouth.	Young people and staff.	▪ Children will not stand near the edge of the stream to prevent slips and falls. ▪ Only staff who are able to swim confidently are to collect the rocks from the stream. In the event of a staff member falling and drowning, first aid will be provided, and emergency services will be called. ▪ Qualified first aiders will be present, and a first aid box will be brought along to the activity. ▪ Staff will monitor children closely and the children will be reminded not to put items into their mouths.	Medium

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Collecting fallen leaves to paint.	The young people will be able to compare different size, colour and shape of the leaves as well as develop their expressive art skills whilst painting. The painting of the leaves can also contribute to the development of their gross and fine motor skills.	- Trips and falls when collecting the leaves resulting in cuts/bruises/grazes. - Consumption of paint.	Young people and staff.	- Young people will be supervised by staff at all times, they will be encouraged to collect the leaves themselves however will only be encouraged to do so in areas where there is little risk of falling. - Staff will be first aid trained and will bring a first aid box to provide treatment to any injuries sustained by falls and trips. - Children and staff to wear appropriate shoes and clothing. - Non-toxic paint will be supplied, and the children will be monitored whilst painting.	Low

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Toy boat race in the stream.	The young people will be able to gain a better understanding of velocity, during the activity they will time how long it takes for different materials of toy boats take to float from one point to another. They will have a better understanding of speed as well as how the current and weight of the toy effects the speed.	- Children falling into the river and drowning. - Children/Adults slipping down the bank of the stream causing injury. - Adults slipping whilst in the stream.	Young people and adults.	- Children will be supervised in small groups when near the stream. - Adults will find an area of the stream that is very shallow & only adults will go into the stream. - Adults and children will wear appropriate clothing and shoes to reduce the risk of falls and slips resulting in injury. - There will be a designated first aider on the walk, in case of any incidents, a first aid box will also be brought along.	Medium

Woodland walk.	The young people will be able to enjoy a wide range of learning environments during the woodland walk which make links to their scientific and mathematical development. The young people can participate in activities which will benefit all areas of learning. The children will be able to have the opportunity to learn about new things such as the life cycle of plants and animals. This type of activity is also a multisensory activity.	▪ Absconding/wondering off from the area. ▪ Consuming of leaves and/or other non-edible items. ▪ Poor weather conditions such as high winds, heavy rain, low/hot temperatures.	Young people and adults.	▪ Staff are aware they have a duty of care to themselves and the young people, and are to intervene immediately if in danger, e.g., remind the young people about appropriate behaviour, not to wander off, stranger danger, not to eat/place inedible/poisonous object/plants in their mouths, traffic danger, uneven surfaces, misuse of equipment and anything else that has the potential to cause harm. ▪ Weather predictions are to be checked the day before and the day of the activity. If the weather is not suitable the event will be rescheduled with parents/carers and children being informed. ▪ In the event of an emergency, staff are to call 999.	Medium
----------------	---	--	--------------------------	---	--------

The Early Years Foundation stage (Department of Education, 2020) states that children are required to have a flexible learning environment with emphasis on outdoor learning, children should be provided with stimulating and beneficial activities and tools to allow for positive holistic development. As explained by Tunnicliffe (2015), children start learning science and mathematics from when they are babies. They are constantly exploring new shapes, textures, space, and measurements. Children are naturally curious and like to question what they do not know. Outdoor learning provides a large scope to discover new phenomena for children. Their development should be supported by practitioners and adults alike who recognise their inquisitiveness and allow them to explore their imagination.

According to Rose and Rogers (2012), the role of the adult in early years settings is a culmination of '*seven selves*.' These seven points are the creator, the carer, the critical reflector, the communicator, the assessor, the facilitator, and the observer. At the centre of these seven points, there is the child. Rose and Rogers (2012) go on to explain that the seven selves are interactive and integrated, each characteristic helps create the next. Practitioners and adults alike should have positive attachments with children, so the children feel safe and secure enough to communicate their needs. For example, in a video from Siren Films (n.d.), a forest nursery shows their methods of teaching. In the video it can be seen that the young child is completing their task by themselves and when they are ready, they are able to ask the adult for support in finishing the task. The role of the adult within outdoor learning cannot be defined exactly, as there may be children with more specific needs who require more support than perhaps their peers. Adults can however support the overall outdoor learning in many different ways. One way an adult can support the development of children's mathematical and scientific development whilst using an outdoor learning environment is to take them to an area rich in nature. According to Knight (2013), this type of environment enables creativity and allows children to explore both physically and mentally.

As explained in the Curriculum for Wales 2022, allowing children to explore their creativity is a very important part of their learning. Outdoor learning may also allow children to be able to gain a deeper understanding of life other than humans, possibly

for the first time in their lives. An outdoor space such as the photo provided in this assignment has endless opportunities for children to learn and develop skills. Outdoor learning environments can benefit from having natural resources as well as synthetic or man-made resources, these can be used interchangeably to suit the needs of each environment. These materials are considered as loose parts which support creative and imaginative learning or thinking, loose parts have no fixed purpose and can be used for endless amounts of different activities. The theory of loose parts was originally discussed by Nicholson in 1971, he believed that all children should have access to loose parts to aid their development and it would be a disservice for them not to be able to explore their imagination and creativity. Due to loose parts allowing children to create their own narrative, there is little chance they will ever get bored of playing with them as if they want to change anything, they can. As well as supporting their educational development, it also supports their mental and social development as it promotes independence as well as skills such as teamwork, patience and sharing. Loose parts have been ingrained into play curriculums in areas such as Wales and Scotland. As explained by Casey and Robertson (2019) there are countless types of loose parts. An example of some natural parts are stones and pebbles, wooden logs, mud, and grass. An example of man-made parts are wooden pallets, tyres, and wheelbarrows.

An important part of allowing children to develop their learning with the help of adults and practitioners is through a method called scaffolding. Wood, Bruner & Ross (1976) defined scaffolding as practitioners supporting the young person's development by providing support structures that allow them to progress to the next stage or level. This method also links in with the 'Zone of Proximal Development' or ZPD, another learning theory by Vygotsky. The zone of proximal development has 3 different stages, the outer layer is the 'anxiety zone' where children are unable to complete a skill or task. The middle layer is the 'learning zone' where children are able to complete a skill or task with guidance and support. The innermost layer is the 'comfort zone' where children are able to complete a skill or task with minimal to no support. Practitioners can use scaffolding methods to support children's transition from one zone within the ZPD to the next zone. An example of scaffolding to support children's development could be introducing new skills to students such as the activity mentioned alongside

the woodland photograph where children will roll a plastic ball down the wooden bridge to see how quickly it can get from the top to the bottom. Some children may have never completed an activity like this before therefore it would be beneficial to model the skill for them to be able to observe and move to the next stage of their zone of proximal development and be able to do the task with support.

Although the practitioners are providing some levels of support to the children, it is also important to allow the children to engage in self-directed play. There may be some activities that they would like to do with the resources around them that wasn't mentioned in section two. According to Scotland Education (2020) outdoor learning is allows children to develop their knowledge, skills and understanding through play-based, child-initiated experiences. White (2019) explains that children have the right play and learn outdoors with the freedom of self-directed play. White goes on to say that the use of an outdoor learning environment provides children with the opportunity to be their natural selves, it gives them the opportunity to experience differing weather and how that feels to them. The outdoors also gives them room to be inquisitive, curious, and creative. According to Keith (2018), to support the mathematical and scientific development of young children, practitioners could create different areas that work on a specific goal. For example, one area of the outdoor learning space could be a mud kitchen; this area could provide scientific development as the activity shows the mud changing state. This example is also a multi-sensory activity for children which we know is beneficial to their learning. Another example of this is to have a construction/building area, this area could develop their mathematical skills as well as their creative skills, social skills, and motor skills. As explained previously, loose parts are a big part of providing a good outdoor learning environment for children, these parts can be used by adults and children for many different activities to aid what areas of development are being covered during that time. Similar to loose parts being able to be used for whatever purpose a child decides they are for, is a theory called play affordance. This is where an environment will be used to give the person who uses it what they need. For example, a person could go into a woodland area hungry and use the resources to feed themselves whereas another individual could go into the same woodland and use the resources to create a fire to keep warm. Children can do this in

outdoor learning, they are able to use their imagination to shape their use of the environment around them (Maudsley, 2009).

The Curriculum for Wales, along with Education Scotland and The EYFS (England) all place great importance upon the benefits of outdoor learning. Similarly, there are many other countries and types of early years practice that believe the same about outdoor learning. For example, the Reggio Emilia approach which was first introduced by Loris Malaguzzi. The Reggio Emilia approach supports the idea that the environment which children learn in is the third teacher. Their learning environment should be designed to engage children (Schroeder-Yu, 2008). The Reggio Emilia approach places great importance on children being able to make their own decisions about their learning. Creating different stations outdoors as mentioned previously, for children to be able to choose where they want to play will allow children to make their own choices but still have some degree of support from the adults. Another similar approach to early years learning is Te Whariki in New Zealand. The approach supports the idea that children learn best through play (New Zealand Ministry of Education, 2020). Similar to the theory of using loose parts, Te Whariki use something called 'adventure and junk play'. Through this approach, children are able to learn to share and collaborate with other students, learn to problem solve and learn to develop their own ideas and thoughts. It is explained that adults can support children in this approach by giving them the space to be creative and explore by themselves. Another influential approach is forest schools which comes from Denmark. The Danish pedagogical practice has drawn influence from many different early years' theorists such as Piaget, Bruner, Vygotsky, Froebel, and many others (Williams-Sieghfredsen, 2017). The main principles of forest school are that children thrive in child-centred environments, children are interactive learners and that learning comes from social interaction. Forest schools are based entirely in the woodland. Because their classroom is the outdoors, the children are able to see the change in nature with the changing seasons, thus supporting their scientific development.

There are many different curriculums and approaches that support the use of outdoor learning and studies have shown that there are benefits far beyond educational development. For example, Harvey et al (2020) state that outdoor learning has a positive effect on mental health and well-being in children. Another study conducted by Mygind in 2007 found that children who use the outdoors as a learning environment

are more likely to have a higher rate of overall physical activity. Higher rates of physical activity mean that children are likely to have positive health outcomes when compared with those who have lower physical activity rates. Children are also able to develop their social and communication skills, they will be able to develop their team-working skills and their listening skills. Using the outdoors as a learning environment has many different benefits that will factor into their holistic development and benefit them for the rest of their childhoods going into adulthood.

References:

Knight, S., (2013). *Forest school and Outdoor Learning in the Early Years*. 2nd edn. Los Angeles: SAGE.

Tunnicliffe, S. D. (2015) *Starting Inquiry-based Science in the Early Years: Look, Talk, Think and Do*. Oxon: Routledge.

White, J (2020) *Playing and Learning Outdoors: The Practical Guide and Sourcebook for Excellence in Outdoor Provision and Practice with Young Children*. Oxon: Routledge.

Keith, L. (2018) *Developing Young Children's Mathematical Learning Outdoors: Linking Pedagogy and Practice*. Oxon: Routledge.

Bruce, T. (2015) *The Routledge International Handbook of Philosophies and Theories of Early Childhood Education and Care*. Abingdon: Routledge.

Schroeder-Yu, G. (2008). 'Documentation: Ideas and Applications from the Reggio Emilia Approach'. *Teaching Artist Journal*, 6(2), pp.126-134. DOI: 10.1080/15411790801910735

Williams-Sieghfredsen, J. (2017). *Understanding the Danish Forest school approach*. 2nd edn. Routledge.

Mygind, E. (2007). 'A comparison between children's physical activity levels at school and learning in an outdoor environment'. *Journal of Adventure Education & Outdoor Learning*, 7(2), pp.161-176.

Harvey, D., Montgomery, L., Harvey, H., Hall, F., Gange, A. and Watling, D. (2020). 'Psychological benefits of a biodiversity-focussed outdoor learning program for primary school children'. *Journal of Environmental Psychology*, 67, p.101381.

Nicholson, S. (1971) '*How NOT to cheat children: The theory of loose parts.*' *Landscape Architecture*, 62, p.p. 30-34.

Department for Education. (2021) *Statutory framework for the early years' foundation stage*. London: UK Government.

Welsh Government. (2020). *Curriculum for Wales guidance*. Cardiff: Welsh Assembly Government.

Casey, T., Robertson, J. (2019) *Loose Parts Play*. 2nd Edn. Edinburgh: Scottish Government.

Visit Wales. (2020) *Garwnant Forest Visitor Centre*. Available at: <https://www.visitwales.com/en-us/attraction/visitor-centre/garwnant-visitor-centre-1843321> (Accessed 9 September 2021).

Education Scotland, (n.d) *Outdoor Learning: Practical guidance, ideas and support for teachers and practitioners in Scotland*. Education Scotland.

Department for Education, (2020) *Early years foundation stage profile*. London: UK Government.

New Zealand Ministry of Education, (2021) *Play idea: Adventure and junk play – Aotūroa*. New Zealand Government.

Little Forest Folks Nursery., (N.d.) '*What does effective teaching look like at the Little Forest Folks Forest nursery?*' (video) Siren Films.

Wood, D. J., Bruner, J. S. and Ross, G. (1976) '*The role of tutoring in problem solving*'. *Journal of Child Psychiatry and Psychology*, 17(2), 89-100.

Tovey, H., 2016. *Bringing the Froebel approach to your early years practice*. 2nd ed. Routledge.

Maudsley M., (2009) *Playing on the Wildside*. University of Gloucestershire: Gloucestershire.