

Awe and wonder- science, mathematics, and the outdoors (ECEY5005/C)Part 1:Part 2:

This is the outdoor area of a nursery classroom, within a primary school. Children visit this area daily with supported adults. The area is complete with child learning enhancements and opportunities. The outdoor area allows the children to be curious while learning.



The mud kitchen in the outdoor area is full of opportunities for children to learn and discover different aspects of their curiosity. The children are able to develop their science skills by using the mud kitchen. When playing in the mud kitchen, two children were playing together with two jugs. One jug of mud, one jug of water. The first child asked me, "What would happen if we mixed together the mud and water?" To which I responded in telling them, "Explore and find out what happens!". The two children, very excitedly, started pouring the water from the jug into the jug of mud. They then began mixing the mixture with a metal spoon. They realised they had made a

different texture by mixing them together. They shouted, “Miss, we’ve made a muddy potion! It’s not hard anymore!” I then explained to the children that by using different amounts of water and mud they could make different textures. We discussed this by using words such as ‘mixing, stirring, thick, thin’. The children then explored further by using the measuring jugs provided in the mud kitchen. They developed their maths skills by adding small amounts of water from the measuring jug. I then asked them, “Could you try and share your ‘potion’ between you?” They then took it in turns to pour from the jug into individual bowls. The children work independently problem-solving by using a trial and improve approach- meeting progression step 1 in the Welsh Curriculum (2022).

The mud kitchen is filled with authentic utensils, this allows the children to become more curious while playing with authentic resources in which they associate with the world they live in. Children develop their communication, physical and social skills.



Guinea Pigs

The guinea pigs are an amazing addition to the children’s outdoor learning provision. The children gain so much knowledge and attachment from class pets. The children ‘owning’ class pets, allows them to gain responsibility and be attentive. The children begin to gain an understanding of nurturing and caring. Having a class pet simulates the learning for young children, instead of basic learning of life cycles, children can see for themselves how an animal grows and is able to live when taken care of. 2 children in the setting were discussing recently, after the summer holidays, “How have the guinea pigs gotten so big?” The other child replied in saying, “I think it is because they haven’t been running around in the summer holidays.” I then educated the children by explaining to them, it had been a long time since they had last seen the Guinea pigs and that in the summer holidays, I had taken them home. I explained that while I cared for the Guinea pigs, I fed them their food every day, ensured they had enough water and allowed them to exercise.

This then meant they were able to grow over the summer holidays as they had what they needed to be able to do so. The children were thrilled when they had been able to gain this knowledge, the child replied, "So maybe if we look after the guinea pigs like you did, they can grow as big as us!" As part of in the moment planning, I called the whole class over and allowed them to hold the guinea pigs. Again, many children commented on the growth of the Guinea pigs. As a class, we were able to discuss how we could work together to ensure we kept our guinea pigs healthy to allow them to grow. The children took it in turns to suggest how we could do this with answers such as, "We need to give them lots of food but not too much, we don't want them to be fat!" and "They need water like me when I am thirsty" and even "They need to run around fast in the playground like us." The children were so excited that they were going to be responsible to make this happen, by feeding the guinea pigs, ensuring they have enough water and making sure they get a form of exercise every day. To improve this area, we are going to create a timetable of care for the guinea pigs, each week different children will be given different responsibilities to care for the guinea pigs, this will allow them to gain even more independence by having certain tasks allocated, while referring to times and dates for part of their maths learning.



The bathtub planter

The bathtub planter is an amazing experience for children to enrich their natural curiosity and learn science through play and exploration. The planter is filled with soil, which the children enjoy exploring through. The children take responsibility in planting the plants and aiding them to grow. Before beginning I asked the children, "How do we grow a plant?", the children replied with, "You put the tree in the mud and then water it" and "Once I put my apple seed in mud and it never grew into an apple tree!" We followed this up by showing the children a PowerPoint, which in pictures as shown below.



(Rain in the eyes, 2019)

After explaining to children, the life cycle of a plant, we discussed the importance of the after care of the plant once we have planted it. After the children had seen the diagram, to check their knowledge I asked them, “What do we need to do to keep our plants alive?” the children shouted out their answers, “water and sun!” One child replied, “I never watered my apple tree, and it was always in the cold!” I explained that this is why his apple tree did not grow and encouraged him to try again and look after it correctly to see if this time, it would grow. We then began our activity, the children took it in turns to add the gravel, the soil, the seeds, more soil, watered it with an accurate measurement of water using a measuring jug from our mud kitchen, as it was important not to over water the plants and we made sure our bathtub was in reach of sunlight. The children were so excited that they had learnt how to grow the plant. We counted how many jugs of water it would take to correctly water our plants and wrote this on a sign. The children each day took it in turns to fill the measuring jug to the correct measurement and water the plants. While exploring and watching the growth of the plants the children explore the mini beasts and insects which live in the soil. The children enjoy being curious, wondering how the insects got there, how there are so many of them and all different aspects of how and why questions. To improve this area, we could add insect magnification jars and magnifying glass for children to explore the living things further. They could look closer into the shapes and sizes of insects, while recognising pattern on them.



(Edu science, no date)



(Fun learning, no date)



The water areas:

Water is an amazing way to encourage young children's mathematical and scientific learning and fine motor skill development. The children this week have been exploring floating and sinking, they have been putting different objects to the test.



When I asked the children, what things can you think of that sink in water, one child replied, "I sink in water! I have to wear armbands on holiday" I explained to the children in simple terms that this was correct because a majority of the time heavy objects will sink in water, whereas light objects will float. We tested it by making a prediction whether the object would sink or float and then trialled it ourselves. This is part of the Welsh curriculum (2022) Principles of progression- children learning through a trial and improve approach. While playing the children learn about measurement, using measuring jugs we fill up the water trays to a suitable amount, the children then use their fine motor skills to pour the water.



Next time we could add simple shaped objects for the children to re explore sinking and floating while discovering shapes. Another thing we could do would be creating potions in the water by adding certain measurements of liquids to create a potion.

Part 3: Risk benefit assessment

Experience exploring outdoor space in photograph	How will young people benefit from this activity?	Hazards and associated risks	Who is at risk?	Precautions in place to reduce the risk of injury	Overall risk after precautions rating: L/M/H
Guinea Pigs	Children can learn about the life cycle of the guinea pigs. Children are able to become responsible as 'owners.	Children/adults could get bitten. Children could have allergic reactions-if allergic.	Children/ adult	Children always supervised near guinea pigs. Adult to assess the guinea pig before showing to children. Do not let near children with allergy.	M
Water	Children learn and develop skills such as, floating and sinking, pouring, stirring. Increased hand eye co-ordination.	Child could drown. Drinking the dirty water.	Children	Children to be supervised at all times. Children to be told to not drink the water/ put their heads in the water before	L

				allowing them to play in it.	
Sand	Sand can be used to develop children's fine motor skills. Children are able to build, pour, squash sand.	Children putting sand in their mouths- choking hazard.	Children	Children should be given instructions to not put sand in their mouths- explaining the dangers to them. Children are to then be always supervised when playing with the sand.	L
Plants	Children will learn about the lifecycle of plants. Children will gain responsibility when looking after the plant when helping it grow. They learn the	Children could disrupt the growth of the plant when exploring the insects.	Plants	Children to be explained to that the plants are to not be touched when exploring the insects as they will be unable to grow.	L

	importance of the aftercare of watering the plants.				
Loose Parts	Children are able to use their imagination to play- allows them to problem solve and think critically using their natural curiosity.	Small parts are a choking hazard to children.	Children	Children should be directed to not put the parts into their mouths as they could choke. Children should be supervised when playing.	M
Children exploring the things they see bugs, plants, flowers.	Children are able to be curious when exploring for insects/flowers. Children can learn about the lifecycles of the insects that they explore.	Children to disturb the life cycle of the insects.	Children	Children to be explained to that the insects are to be explored gently not to harm them. Adult supervision.	L
Mud kitchen	Children are able to develop their communication, physical and	Metal pots and pans are heavy, could be dangerous,	Children	Children to be supervised while playing. Warned to play gently	L

	social skills while playing in association with the world they live in. Children develop maths and science skills.	harm someone.		with the equipment as it is heavy and could hurt somebody.	
Fencing	Children feel safe and secure in the environment they are playing in.	Fencing isn't tall, children could climb over. Splinters from the wood.	Children	Adults to ensure fencing/gates are secure and shut before allowing children out to play.	L

Children's play is detrimental to young minds learning and development. However, children cannot grow, develop and learn to their fullest potential without the help of enabling adults. How do adults support and encourage the mathematical and scientific concepts of outdoor learning. White (2011, p. 35) states Practitioners who value the outdoors and understand its possibilities and impact on early children's development are crucial for working with young children. However White describes that adults and practitioners can be the 'gatekeepers' to children's experience and access to outdoor learning.

White (2014, p. 1) states all children have the right to experience the outdoors. Children's minds thrive in development when allowed to experience outdoor environments which simulate their curiosity and learning through play. They have the right to interact with children and adults learning with them. Indoor learning cannot fulfil the experience that children need to fully develop; the outdoors offers numerous varieties of potential learning path in which children might not engage in whilst playing indoors.

Richardson (2013) states when developing children's learning the role of the adult is detrimental. Adults should understand each child should be encouraged to attempt a mathematical activity in which is a suitable level for them. When allowing children to freely problem solve in the outdoor space, adults must allow children to independently try without interference. Whilst encouraging children to use their natural curiosity as it is essential to children's learning.

Skinner, Carole, et al. (2012, p. 36) discuss the importance of outdoor mathematical learning for young children. They suggest the role of the adult whilst participating in outdoor mathematical learning is not to just supervise, but to get involved and be a 'co-player' within the children's learning through play. Practitioners should model the plan which is being delivered whilst using specific mathematical terms to enhance the learning. Practitioners can ask children open-ended questions to allow children to answer in their own unique way to their fullest ability. They can encourage the children to talk about what they're doing, for example: When a child is counting objects in the outdoor, they could ask why they are doing this, they can be challenged to count a larger number of objects, asked what shape the objects are. Adults are often the barrier to enhancing outdoor play to its full

potential as it is often over-complicated. Practitioners can plan the outdoor experiences around the success and failure of the indoor activities, if it wasn't a success indoors, could it work better outdoors?

(Piaget, 1952, quoted in Sargent 2015) states basic concepts are understood with more ease while physically exploring. They believe complex thought comes from hands-on experiences as they incorporate the knowledge that they attain. Children gain a widened knowledge of how the world in which they live in works while exploring themselves, the outdoor area is majorly beneficial for early years scientific learning. While experiencing the freedom that the outdoors has to offer, children are able to see the world of living things and materialistic changes happening in front of them. (LTS, 2010, quoted in Sargent, 2015) suggests learning outdoors allows children to understand further between curriculum areas allowing them through experimenting and experiencing to make connections. While experiencing the outdoors children's curiosity is naturally broadened, when children are given opportunities to closely look at how the world in which they live in works they gain a basic understanding- wider than what they would've learnt without seeing it. Exploring is a fundamental part to early years scientific learning. Children thrive from exploring different materials and living things, the children can engage by discussing different aspects of the life of an insect.

Science in the early years should be mainly a hands-on learning experience, however this approach comes with many opportunities to compare and gather information through observation. Practitioners are a key factor to scientific learning as they are there to provide the children with the information and opportunities to learn. Practitioners should provide children with key words through discussion during the exploration to allow the children to gain the knowledge that they need. While learning science through their exploration children have a natural curiosity to ask questions- practitioners can model scientific questions to children to encourage them.

Welsh Government (2009) state, in order for everyone to effectively implement the kind of experiences decided upon for the children, settings must make sure every practitioner completely comprehends the rationale behind the vision for outdoor provision. All enabling

adults must be willing to allow children to have the access that they need to experience the outdoor provision.

Conclusion:

In conclusion, outdoor learning is massively beneficial to early years children's learning, specifically discussed in mathematical and scientific learning. The role of the adult is **fundamental** in enabling children to reach their fullest potential whilst experiencing outdoor learning. As White (2011, p. 35) states Practitioners who value the outdoors and understand its possibilities and impact on early children's development are crucial for working with young children. Children's fullest potential of learning and development is met when outdoor learning is provided. By allowing children to develop their mathematical abilities by using materials from the world they live in will only have a positive impact on their learning. As well as this, children will benefit from learning scientific knowledge and understanding from experiencing an outdoor, exploring, hands on approach. With all of this considered as White describes that adults and practitioners can be the 'gatekeepers' to children's experience and access to outdoor learning, adults should see the endless positivity's to outdoor learning.

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