

Awe and Wonder – Science, Mathematics and The Outdoors.

Section 1



(Source: National Trust Organisation, No Date).

Section 2

Learning Story

A winter trip to the beach.



This image enhances children's learning holistically with different areas to explore allowing them to be curious. There were ten children taken to the beach altogether. The age of the children that was observed were four/five-year-olds and all these children attend a primary school nursery in the morning and a non-maintained setting in the afternoon. It was cold with spells of rain throughout the day. However, both children and staff were dressed appropriately. To develop their knowledge, I added resources throughout the day including loose parts.

The children arrived at school. Ten children were picked to be taken on the trip, both boys and girls, the other children were taken the day after. Once the register was taken and we did check in on the carpet, I said to the children "Today we are going to the beach!", The children all cheered with excitement. One child replied "I have never been to the beach before" with curiosity. I gathered all the children and made sure they were dressed appropriately and had spare clothes in their bags. We asked them to put on their coats from their pegs and they grabbed their wellies. We got on the bus and made our way to the beach. When arriving I set out rules. Each staff member had a certain number of children to look after due to ratios.

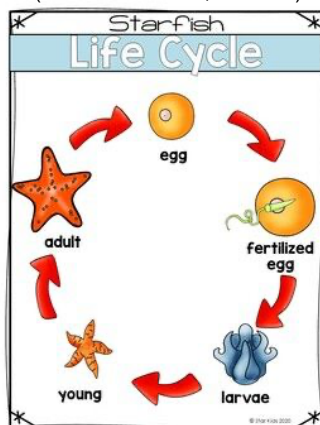
Then off they went to explore. My job was to observe and support the children. One child had an interest with something near the pebbles and made others around her curious too. Child A found a washed-up star fish. They were fascinated by it. Child A shouted "Miss Morgan, come and see this!". I went over and gasped, more children gathered around with inquisitiveness. I said with awe and wonder

“Wow look at that, do we all know what this is boys and girls?”. Child A didn’t respond and stared at me with bewilderment whilst waiting for me to reply. I said, “This boys and girls is a star fish!”. I believed many children had not seen one before so without hesitation I asked “Where did this come from. Shall we find out together!”. Others lost interest and went to explore other areas, but Child A replied with ‘yes’ joyfully.



(Source: Norfolk Wildlife Trust, 2023)

(Source: Pinterest, No Date)



So, off we went and found a space on the sand. On the iPad we took to the beach I firstly found a digital book on YouTube about starfish where it read to her, educating both of us. It included all facts about starfish and was very educating. After finishing the book, she shouted “It lives in the sea!”. Although we found out where it came from which is what she wanted to know at the beginning, she then wanted to explore the life cycle of the starfish, as it mentioned in the story. I asked “Can you remember from the book, how the starfish first started as. She replied, “an egg!” then we got a notebook and started to draw the rest of the cycle with support off me.

To enhance her learning, we went to get a magnifying glass so she could examine the starfish up closely after learning about it. We counted how many arms the star fish had. She counted “one, two, three, four.....it is missing a ray” but looked at me and said “Don’t worry miss Morgan in the story it said they are meant to have one more but it will grow back!”. Child A listened to the story and picked up the correct terms for the starfish but also realised one arm was missing and needed one more to make five. This stimulates her mathematical development. As well as this we took photos of the starfish so once we got back to the school, we could document Child As learning that day.



(Source: Pinterest, No Date)

What does this mean?

Due to Child A being ambitious and cable to learn she successfully deepened her knowledge about starfish through her own curiosity, which is one of the four aims of the new curriculum for Wales (Welsh Government, 2022). She also showed understanding of life cycles. This connects to the curriculum for Wales-**The world around us is full of living things which depend on each other for survival** as she could understand how a creature evolved over significant periods of time (Hwb Wales, 2020).

There was another observation I saw during that morning. I brought to the beach many resources including treasure baskets as there are lots of things children can collect at the beach. This one child, Child B, grabbed a basket and starting to collect things. Altogether she captured shells, pebbles, sticks, she used an insect pot to collect sand and a plastic bottle.

(Source: How we Montessori, 2017).



As I watched Child B explore the beach looking for different materials the basket was getting quite full, so I went to see Child B and said "That's getting full! Do you want to tell me what you got in there?" Child B was very excited to show me what she had found, and I was also intrigued. She started to sort each material out without my help. She put the stones all in a pile, shells in a pile,

sticks in a pile..... as she was sorting them, she laid them out in a line and was counting them. Whilst doing this she was using mathematical terms such as more than/less than. Then another child near child B was making footprints in the sand. He was looking over at child B to see what she had in her basket. I stood back and watched. Child C said to Child B "Let's use the pebbles to measure our footprints". Child B was more than happy to share. Firstly, Child C made a footprint and used pebbles to measure. He said, "We have to start from the bottom and make a line to the top of the foot and they have to be the same size pebbles." This was recapping what we had taught them a few weeks ago in school when learning about measurement. Child B agreed so they went over to the pebbles and gathered roughly the same size ones and added more to their collection. They used terms "This is the same, this is too big or too small." Once they decided on the pebbles they started to measure. They did both their feet and asked me to join in. I made a footprint, and they used the pebbles to measure. Then without me speaking, they were able to identify "Mrs Morgan's is bigger than our feet." And Child B's foot was smaller than Child C's foot. This was a great way of visually seeing measurement and using correct terms. This links to the curriculum as child B and C are learning about the **World around us is full of living things which depend on each other for survival** by identifying, following and beginning to create sequences and patterns in everyday activities (Hwb Wales, 2020).

(Source: BBC, 2022).

One object Child B found at the beach was a plastic bottle. Before Child B picked it up, she came to ask me "Miss Morgan, Can I pick this up or is it dangerous." I let her continue as I was there, and I gave her gloves; I thought it was important she could learn about litter and the effect it has on the environment. She asked me "Why has someone left this here? This should be put in the bin my mum said." I replied, "Yes you are right it should, let's do the right thing and pop it in the bin together." This concept showed me how she understood how important looking after our planet is. This linked to the curriculum in Wales-



Being curious and searching for answers is essential to understanding and

predicting phenomena. This child would be on progression step three-I can understand how my actions and the actions of others impact on the environment and living things (Hwb Wales,2020).

All the children were gathered, and we did circle time on the sand, where each child said their favourite part they did at the beach. We packed up the resources and made our way to the bus and went back to the school.

Section 3 1000 words

RISK BENEFIT ASSESSMENT

Location / Activity:	The Beach	Date:	15 th March 2023
Assessor:	Lucy Morgan	Review date:	15 th September 2023

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.

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
The sea	- Children can learn about sinking and floating, motion and flowing water. - Stimulates the children's senses. For example, hearing the water. - Giving children the opportunity to see the ocean for the first time. - Children can learn about what lives in the sea. - Children will learn about food chains, lifecycles and the eco system.	- Children drowning. - Children getting stung by dangerous things in the water for example jellyfish. - Children getting wet potentially causing them to become ill. - Children coming into contact with debris. For example any type of rubbish. - Algae in the water. - Depth of water may be misleading. - Due to weather conditions the water can change.	Children and Adults.	- Children should have the correct clothing and shoes for example, wearing waterproof clothes and wellies. - Check the water tide times so staff are aware of water tides. - As well of tide times, weather conditions should be checked. If it is raining and windy this will have a huge impact on the sea. - Before the children enter the water check briefly to see if there is anything dangerous for example, debris or algae. Then children can be directed to another area.	Low

Children exploring things they see such as insects, animals, flowers, plants, shells.	• Children have the opportunity to learn about living creatures. • Children have the opportunity to learn about life cycles. There are many animals on the beach so therefore children can learn about where they live. • Physical development both gross and fine motor skills. Gross motor skills when children are moving around finding these things and bending down or up to reach them. Fine motor skills because children will be using their hands to pick up the insects and other objects. • Children have the opportunity to stimulate their five senses. For example, seeing the objects, touching	• Children may wonder far when exploring and encounter strangers or dogs. • Children may touch dangerous objects. For example, poisonous plants. • Children may have allergies. • Low level branches may cause an injury. • Plants may cause scratching. • If children explored the sand dunes there could sharp items or hazardous animals. • Children may put things in their mouths	Children and Adults.	• Be cautious of strangers- have staff members spread out across an area and give children boundaries where they can and cannot go. This could be done by setting up cones. • Explain to children they are not to touch dogs without asking or having a staff member present. • Provide colourful high vis jackets for children to wear so that they can be seen easily. • Before starting the activity educate the children on what is dangerous and show them. As well as this explain if children come across something new, explain they must notify a staff member before touching. A	Low
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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
	insects, smelling the flowers, listening to the way the animals sound such as birds. • Learning about how to be an ethical citizen. • Learn about bio diversity.			game can be used. • Beforehand, identify any allergies children may have by sending out a form. • Make sure all children are wearing the correct clothes and shoes for example, long top and trousers so that they are protected from scratching. • Make sure all children wash their hands at the end of the activity. • Examine the area beforehand, removing any objects that is visible that may be dangerous. • Golden rule- nothing put in mouth.	

Uneven ground for example stones or sand dunes.	- Supporting children's sense of balance. - Children's physical development-understanding how their body works. - Children become aware of gradients. - Supports forces and energy.	Children may fall, trip, cause cuts or bruising and other injuries.	Children and Adults.	- Explain to the children that it is a new experience and support them throughout. - Encourage them to walk slowly first for them to gain confidence. - Play a fun game with them, for example wobble to help them balance. - Having the appropriate shoes and clothes. For example, all children must wear closed in shoes like trainers and have long trousers on and sleeves so that they are protected.	Low
Children collecting materials	Children can explore properties of materials and choose	Children may pick up litter or something	Children and Adults.	Ensure there are enough staff members,	Low

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
	specific materials for a particular use. • Schemas • Mathematical development • Children can sort materials out and create pattern or shapes. • Children may find new objects they have never seen before.	that is dangerous. • Children can put objects in their mouths. • Children could go to explore and get lost.		parent with DBS's should be offered to go on the trip to support. • Golden rule- nothing put in mouths. • Educate children what types of materials are good and ensure they see an adult if they are unsure of something.	

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
Resources	• Supports in-depth learning for example, a book about lifestyles and pen and paper to draw things they see. • Open ended play. • Books allows children to visually see and expand knowledge on a specific topic. • Taking Jugs will enhance many scientific and mathematics concepts. • Having bug pots can allow children to explore the animals closely.	• Magnifying glasses or bug pot could break and injury a child for example cut their hand. • Resources could get left behind for example a book which costs money to replace. • Resources being left behind and becoming litter. • Resources not being used so therefore not allowing children to gain more depth with their learning.	Children and Adults	• Provide plastic objects for example plastic pots instead of glass. • Make sure all resources are uncouncted for before leaving the beach. • Only use what children want and put back in bag once used. • Teachers should encourage all children to use loose parts to enhance their learning.	Low

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
Outdoors in different weather conditions	- Children can learn about temperatures such as scientific words such as hot, cold. - Children can learn about the environment. - Children have the opportunity to learn about the water cycle. - Learning about different weather conditions and can learn how to identify when it can harm them or a measure needs to be put into place.	- Children could get wet and therefore will not be willing to learn. - Being wet can also cause hypothermia. - High winds could cause sand dune to spread. - If it was sunny, this could cause the children to become too hot or burn and cause heatstroke. - Extreme weather can cause rough tide as this could cause drowning.	Children and Adults	- Make sure children are dressed appropriately for example, waterproof coats and trousers with the correct shoes or sun cream and hats. - Check the weather forecast beforehand making sure there are no high winds. - Bring spare change of clothes in case children become wet. - Checking the tide times before hand making sure there are no high tides.	Low

Section 4

The Role of the Adult

In all settings in The Early Years, we want children to be 'little scientists' as Jean Piaget (1952) once said. Practitioners should support children in order for them to thrive, article 6 states every child has the right to life. Governments must do all they can to ensure that children survive and develop to their full potential (UNCRC, No date). Their role is to create safe environments for children to learn in, observe and plan to the child's needs, connect school and home communities together, be responsive to children, encourage them to take risks and make their learning fun (Welsh Government, 2023). Children in early years learn in both indoors and outdoors environments, both should be facilitated with the correct preparation, staff input, evaluation, resources, and interactions (Bilton, 2010). For this assignment this section will be based in the outdoors, highlighting the importance of the role of the adults and mathematics and science development.

According to Furner and Kumar (2007) Mathematics and science should be brought together overlapping concepts and principles to enrich the learning context to provide meaningful learning experiences. Grigg and Lewis (2016) states learning outside the classroom, in the outdoors can offer opportunity to learn through real life experiences which is meaningful for the child. The outdoor area allows children to measure using real things making it enjoyable and realistic. Many children have natural interest in maths for example counting, looking at shapes and patterns. Talk is significant in order for children to develop their thinking skills (Pring, 2007). To expand children's knowledge, teachers must question. Sustained shared thinking is a method teachers should use in the Early Years. Sustained shared thinking is when "two or more individuals work together in an intellectual way to solve a problem, clarify a concept, evaluate activities" (Brodie, 2014). It is only done when all the individuals contribute to the thinking and expand their knowledge. This can occur between children and adults or with children and children. Open ended questions and showing interest for what the child has to say encourages sustained shared thinking. Phrases such as How did that happen? Can you tell me more? What do you think? stimulates sustained shared thinking also (Blatchford, 2002). This is beneficial to the child as it encourages critical thinking and problem solving (Brodie, 2014).

Science terms can be taught whilst children explore their environment. For example, outdoor activities stimulate everyday science development. Children can learn about forces, movement, life cycles, properties, weather seasons, habitats, natural cycles by experiencing the outdoors (Grigg and Lewis, 2016). Multi-sensory experiences which the outdoors environment offers can support children to retain knowledge successfully. Children can learn to measure using their bodies through real scales because of the space they have to learn in (Malone and Tranter, 2010). Learning about the environment and citizenship can be done by learning through hands on experiences in the outdoors which is a rich experience allowing children to visually see (Dillon et al. 2005).

Positive behaviour and attitude from adults towards the outdoors is critical to provide the best opportunities for children (White, 2011). Positive, caring, responsive relationships between a child and an adult can be argued the most important during the first five years of a child's life as millions of connections are forming in their brain

allowing development (Raising Children Network, 2023). Adults that are engaged, enthusiastic and understand the importance of outdoor play will allow endless opportunities for children. Practitioners' role is to provide a safe environment in order for children to feel safe enough to be curious and explore (Welsh Government 2021).

There are many approaches that believe the role of the adult plays a huge part in children's development and learning. Froebel believed there were many benefits to children playing outdoors, and children are seen to be "curious, creative, adventurous and imaginative" (Tovey, 2013). He believed the outdoors had many opportunities for children to be able to do hands on experiences where they learn best. It offers interactions with nature and wildlife. The space allows them to be free and they can explore and experiment to find out about the world around them. The outdoors allows children to achieve links to the curriculum. Many scientific and mathematics concepts can be learnt in the outdoors by doing. For example, gravity, speed, energy, life cycles. The environment was very important to Froebel, interactions made with the children were just as important to him also. (Tovey, No date). A Froebelian approach highlights the importance of relationships, Tovey (2013) states he believed they should be "close, trusting, responsive, interactive, and intellectually engaging". This can be done by using a 'key person approach' so that practitioners can get to know each child making them feel important and Part of a caring community which is a Froebelian principle (Elfer, Goldschmied, and Selleck, 2011) (Department of Education, 2021).

Reggio Emilia was founded by a man called Malaguzzi. He believed teachers should build rich environments that stimulates exploration and problem solving (Loh, 2006). The Reggio Ameillia approach sees teachers as the learner alongside the children and to be guides. Malaguzzi believed teachers must be naturally curious about the world they live in just like the children (Early Education Support, 2006). Documentation and observation is crucial in a teachers job role in Reggio Emilia as well as self-evaluation. Documentation is done in classroom through many ways such as taking photos or videos, conversations are recorded, or drawing and art are kept. Observations and assessments should be carried out over a period so that the child can be understood and assessed fairly. Albert Einstein once said "Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid" (Oakshott, 2021).

Loose parts

Loose parts was a theory created by Simon Nicholson. He believed they were "materials that are variable, meaning they can be used in more than one way so that children can experiment and invent through play" (Nicholson, 1971). Loose parts are moveable, instructed, provide open ended experiences and natural (Aussie childcare network team, 2022). An example of using a loose part is a child using a stick as a fishing rod over a tuff tray, a wooden spoon to stir a mud pie or used as a sword or a magic wand! (Robertson and Casey, 2019). Although children benefit hugely by using loose parts, the adults must facilitate and support. Adults must provide loose parts and encourage children to develop their learning. Nicholson (1971) believed environments such as schools, playgrounds, hospitals, day care centres, international airports and art museums have apparatus which are clean, static, and impossible to move around so therefore children will not receive any exploration or discovery skills. Niehues et al (2013) suggest loose parts has been found to increase

children's creative, social and physical play as well as their physical activity. Loose parts develop being creative, problem solving skills, counting skills, physical development, knowledge and organisation skills (Arnerich, 2023). Loose parts can provide learning for children linking to the curriculum in Wales. Children can pick up loose parts and whilst exploring can use correct terms. For example, children may want to explore bugs or insects and to enhance their learning they will use loose parts for example bug pots or magnifying glass facilitated by teachers to expand their scientific development. Schematic play is when children repeat actions or certain behaviours in order to find out about the world around them (Education Scotland, No date). There are many different types of schemas children may display, they can show more than one also. Loose parts help children's schemas and allow them to explore each one (Education Scotland, No date). Transporting may be one schema (Sach, 2023), loose parts will then enhance their transporting schema because children may transport materials in a wheelbarrow. These schemas then turn into later concepts (Athey, 2007).

Affordance is another theory similar to loose parts and in the outdoors. The affordance of the "environment is what it offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 1979). Affordance is how someone perceives an object, animal or person in an environment. For example, one child could see a wooden pallet in the middle of a nature reserve in their school as a stage where they can perform whereas another child may perceive it as a step from them to use to jump up and down. This approach allows children to curious, explore, play, learn and be physically active (Kernan, 2010).

Challenges practitioners may come across with outdoors learning.

In a survey conducted by Bilton (2020), she wanted to identify teachers attitudes on the early years outdoors environment. Many respondents said one challenge of taking children outdoors to learn is the attitude of other adults around them including head teachers making it challenging (Waite, Davis, and Brown, 2006). Many said other staff members would be hesitant to go out because of "being cold, dislike the outdoors area, not having personal experience of working outside or knowing how to behaviour outside" (Bilton, 2020). Another limitation was the weather for some respondents. Some said how the weather was one, but some argued not having correct clothing was a concern as to why they would be cautious to go out (Ernst and Tornabene, 2012). Parents attitudes was another step back for some practitioners, some parents have a fear of their safety or believe that it is not educational (Ernst, 2017) (Holloway and Valentine, 2000) (Munoz, 2009). However, in another survey it highlighted how most mothers had knowledge on how important outdoors play was. Some had a holistic view on outdoor play and believed children benefit their development by being able to run freely and have access to fresh air (Little, 2015). Another reason adults may not encourage outdoor learning is having a fear of their own for the children's safety in the outdoors (Kernan, 2010). Even though, risky play is a benefit to children. Lack of suitable space is also a limitation for some practitioners in settings (Kapogianni, 2019).

Conclusion

To conclude, the adult's role in early years has a huge impact on children in any environment. The outdoors area is crucial in order for children to develop holistically.

Training must be given to every professional working with children so they can discover about the importance the outdoor has on children and limit the challenges si children are not affected by adults views. Outdoor learning can enhance any area in the curriculum especially maths and science. Children are constantly using resources in the outdoors which stimulates their learning. This cannot be done without adults' provision and support.

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