

Awe and Wonder – Science, Mathematics, and the Outdoors
ECEY5005/C



(Source: White, A. (2023) Skewen Park).

Section two

The above picture is where we have visited several times with the children, it's the local park. It is a large space for children to explore it has concrete, trees, and grass areas. The area is large so plenty of space for the children to explore and experiment, also the path has a slight slope. Learning outdoors has a lot of benefits for children and promotes holistic learning and their wellbeing bringing the four purposes and the six areas of learning together as one.

The park is a space which we will be returning on a regular basis for the children to explore and discover the full potential of outdoor learning. Children learn best with the natural materials investigating their surroundings and where they fit in. The age of the children is reception/year one four and five.

Discovering science has a lot of opportunities for children outdoors. The children have the space to investigate their surroundings in depth with asking questions and exploring with their five senses. Practitioners can enhance the children's learning by adding resources for example: - magnifying glasses and bug boxes for the children to collect the insects and explore their physical body for themselves, the practitioner can develop their learning by asking direct questions to support the children with problem-solving and explore different areas of the insect's life cycle.

As we enter the park the children are gathered to explain the rules of the visit, one child said, "I am so excited to run down the slope", I replied "what do you think will happen if you run fast down the slope"? The child started to think about speed, fast, slow.



(Source: Pexels no date).

The children were split into smaller groups and given an area of the park to explore. My group was given the tree area to explore, the children were observing the trees, climbing on the branches, they were having a conversation about how the trees are so tall and had loads on leaves on them. One child notices that the leaves were started to fall off and were different colours. The child asked, “why are the leaves falling off and changing colour”? I gathered the children together in a group and asked the question. Why do the leaves fall off the tree?



(Source: Goodfreephotos no date)

I asked the children to collect some leaves on the ground, looking for different colours and shapes. We all had a conversation about why the leaves were falling off and the reason for them being on the ground and identifying the different shapes of the leaves. The children asked, “why are the leaves different colour to the ones still left on the tree”. I replied “what does a tree need to grow? One child said “water”, “how does the tree get water, does the park keeper water the tree? It made the children think does the park keeper water the trees.

I asked does mum or dad water the trees in your garden. One boy mentioned when it rains the tree gets water to grow. The conversation was about rain, seasons and why the leaves changed colour when on the ground.

I brought resources on the visit to enhance the children’s learning and exploring to enable them to think and challenge themselves, the bug hunt was a big hit with the children as they had freedom to explore the whole area. The sheet was different to meet the ability of the child. All children were included and could access the curriculum. The children were excited to go and find the insects and explore where they had found them.



This sheet will enable the children to explore and discover the different habitats of different insects – living in wet soil, on the trees. The children’s learning can be enhanced by extending the hunt to “find insects that fly”, “find insects that have legs”. This activity has dual purpose, looking at insects and where they live and bringing the maths in with counting how many insects they find, grouping them (legs, spots, wings).

(Source: Messylittlemonster(no date)).

As stated in the Curriculum for Wales 2022 - observing progression stage one and two in early years the child is to be curious and make sense of how the environment works. To explore the environment and communicate to an adult. what was discovered make observations of their findings. (Hwb.gov.wales, 2020).

The groups were swapped around so the children could get to explore different areas of the park in detail. We moved along to the concrete path which was sloped. First exploring the children noticed was if they ran down the path, they would go fast and running up the slope was more difficult. A girl asked “why is it easier to run down and harder to run up the slope?”

“Good question” I replied. We discussed the question as a group. Bringing mathematics and science into the learning we talked about speed, gradient, fast and slow. I had brought shapes and objects to observe if they would roll, go fast, slow, if they would roll in a straight line if not why?



(Source: Wikipedia no date).

I asked the children to think about the shapes, what they look like, if they were curved, if they have sides, pointed edges. The children started to observe and explore in a group the properties of the shapes and started putting them in piles of different styles of shapes. I stood back and observed the children trying each shape down the slope to see what was going to happen. They soon realised that the shapes with points and sides did not roll, I asked the children “why did the shape not move, what stopped the shape from moving? I stepped back and observed the children, working out the question (why). The children worked together.

They decided to separate the shapes into groups (points), (curved) and (sides). The experimented with them rolling on the slope, deciding which ones were no good and the ones that rolled down the slope, one of the children said, “the shapes with no edges and points roll the best” I asked, “why is that”?

The children came up with different reasons why, they were able to communicate with myself and the other children their reasons. Using their curiosity and imagination to explore and discover. Experimenting is a skill children use well to discover how their bodies work and the world around them.

It was time to return to school and discuss our findings of the visit, it is important for the children to realise that mathematics and science is not just for the school setting it can be used and found outside. We have circle time back in school and the children discuss their findings the other children, they were excited to share what they discovered and communicated well. The children use their curiosity and imagination to access all six areas of learning which can be explored outdoors. The role of the adult needs to be enabling supplying the children with the correct resources and allowing the children to explore and discover for themselves, make mistakes, and try to problem solve.

RISK BENEFIT ASSESSMENT

Location / Activity:	Local Park	Date: 1/10/2023	
Assessor:	Amanda White 2216955	Review date: 1/12/2023	

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.

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
Speaking to strangers in the park.	1. Social skills.	2. Staff and children not knowing the person. 3. Children not being aware of 'Stranger Danger'.	Children, staff, volunteers.	1. Prior to the visit explain to the children the danger of speaking to strangers, through video, questions. 2. Tell a member of staff if approached by a stranger.	Low

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
Rainy weather	1. Feeling the rain on their bodies. 2. Exploring their senses. 3. Questioning the water cycle. 4. Supports fine and gross motor skills.	1. Children tripping, falling, sliding on the wet grass. 2. Feeling the cold weather is outside too long. 3. Children not having the correct footwear and clothing.	Children, staff, volunteers.	1. Explaining to the children about how the surface of the ground is wet and the risk of falling is higher. 2. Carry a first aid bag with you. 3. Send a letter home to parents explaining weather conditions to send their children in the correct clothing for the correct weather on the day of visit.	Low

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
Slope	1. Exploring speed – how fast and slow. 2. Direction – positioning language. 3. Experimenting with balance on the slope. 4. Children observing balance and co-ordination. 5. Enhancing their physical ability.	1. Running too fast. 2. Falling over – out of balance. 3. Not understanding positioning language, knocking other children over.	Children.	1. Explaining to the children the danger of the slope. 2. Modelling the positioning language. 3. First aid bag accessible. 4. Wearing the correct footwear. 5. Having an area that has a flat surface.	Low

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
Approaching dogs.	1. Experience of a real animal. 2. Social and emotional skills.	1. Having an allergy to the dog. 2. The dog not being friendly, could bite the child. 3. The dog being over friendly and frightening the child.	Children, staff, volunteers.	1. Explain to the children the danger of approaching a dog. 2. Have allergy forms to identify animal allergies. 3. Model what to do if a dog approaches them. 4. Tell a member of staff if they notice a dog off the lead.	Low

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
Walking to the park (traffic)	1. Understanding safety. 2. Understanding road traffic (traffic lights).	1. Child getting hit by a vehicle. 2. Vehicle leaving the road.	Children, Adults, volunteers .	1. Having the correct staffing ratio. 2. Explain the basis road safety to the children.	Low

Consent/Contact Details.	1. Social skills. 2. Accessing the curriculum. 3. Having the experience of the visit.	1. Being in an unfamiliar place. 2. Children getting lost. 3. Emotional issues.	Children.	1. Explaining to the children what they are going to explore. 2. Every child to have a consent form and a member of staff taking them to the visit. 3. Showing the children an image of the place, they are visiting.	Low
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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
Staffing Ratio	1. The full experience of the outdoor space. 2. Holistic learning.	1. Children getting hurt. 2. Safeguarding issues. 3. Not being able to go on the outing. 4. ALN children not being able to attend the visit.	Children, staff, volunteers.	1. Ensuring enough staff are made available for the visit. 2. Asking to parents to accompany some children. 3. Split the children in small manageable groups. 4.	Low
Climbing trees.	1. Risk taking. 2. Exploring mathematical language – big, small, tall, short. 3. Underestimating their ability and capabilities. 4. Social aspect of helping other children.	1. Falling from climbing too high. 2. Scratches and grazing from loose branches. 3. Bark being wet and slippery.	Childre, staff, volunteers	1. Give the children a safe height to climb. 2. Limit the number of children climbing at one time. 3. Carry a first aid box. 4. Wearing the correct footwear. 5. Assigning a member of staff to stand at the bottom of the tree.	Low

Boundaries of the space.	1. Having the full experience of the visit. 2. Learning rules and discipline. 3. Understanding safety.	1. Children getting lost. 2. Strangers talking to them.	Children, staff, volunteers .	1. Explain the boundaries to the children. 2. Set markers of the boundary. 3. Model the boundaries. 4. Explain the dangers of stepping outside the boundaries.	Low
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Section Four

As stated in Froebelian early years setting, children can have the opportunity to move, expand exploring their physical movement to play and not worry about anything. The outdoor environment provides children with nature which supports the child's five senses and their imagination with wondering what to explore. The outdoor environment is full of surprises which the children can shape to make it their own (Tovey, H. 2012). Montessori was assured that learning through play in an outdoor environment was powerful that the children had unlimited access to the outdoor environment (The Montessori-Minded Mom, no date). When children play outdoors it a different type of play as it allows larger movements more learning opportunities and have access to the natural material (Bento & Dias, 2017, 157-160). Outdoor play is also known as 'activity play', which there are no rules, unstructured, which has benefits to the growing body and the child's development (Pellegrini & Smith, 1998b, 577-598). Therefore, playing and learning outdoors, has the same types of play as indoors, the social skills are enhanced plus the outdoors is an optimal environment for children to play (Kilkelly et al. 2016, 1-60).

Brookes, (2002) and Steward, (2006) disagree largely that the awareness of historical and cultural aspects of the outdoor and classroom based. However, Greenwood, (2008: 239) children learn best in outside spaces they are familiar with and people. From research learning in an outside environment the practitioner can observe the children and their natural behaviour. The observation is not connected to any outcomes or progression steps it's observing the child holistically. The Early Years Foundation Stage Framework mentions that children should have the same experiences being inside the classroom and in the outdoor environment, also according to the (DFSE, 2007: 5) the outdoor environment has a large impact on supporting and moving forward the child's learning and development, the are should be available to the children all year around and daily. As noted, the framework does not have the national standards for outdoor experiences for the younger children it is still restricted (Tovey, 2007).

According to A Curriculum for funded non-maintained nursery settings (2022) providing children with learning outdoors is beneficial for their emotional and spiritual development, it can also support the child's confidence. An outdoor environment allows authentic opportunities, for the four purposes. Learning in the real world gives children the opportunity to explore, use their imagination it also supports them to understand the world around them. As stated in The United Nations Convention on the Rights of the Child Article 31 children have the right to play, rest and leisure (UNICEF, no date).

Maslow stated that children develop their self-confidence and self esteem in an outdoor environment, the children to access a higher level of learning experiences, where they are engaged in their own play and the progress of the pace. Children need to have the correct clothing and footwear on to benefit from the environment (kindling play and training, 2018). As mentioned in the Curriculum for funded non-Maintained nursery settings being outdoors plays an important part of the child's learning it supports the child holistically capturing every aspect of their development. The outdoors provides children with rich and inviting experiences for them to explore, the outdoor environment allows the child to have opportunities for the development of skills related to the four purposes (Gov.Wales, 2022). According to Rousseau and Pestalozzi nature has a positive impact on children. Susan Issacs agrees with Rousseau and Pestalozzi that play outdoors is important in early years. Mc Millan and Issacs have the same concept on outdoor play, Millan stated that children benefit from outdoors with regards to their health and physical development, as Issacs focuses on the child's gross motor development (Brighthub Education, 2022). Friedrich Froebel had a different concept of outdoor space, providing an area for children, which gives the children time and space to explore with nature and natural materials. Froebel stated that children are curious, creative, and active learners, who learn when they are in a safe environment with good role models, children learn by having first hand experiences and by exploring by themselves. Froebel mentioned that the quality of the environment and the opportunities that are provided are crucial for children's learning (Tovey, H. no date). Piaget's main theory is ensuring play to support psychological development, outdoor learning and play covers all areas of learning and makes children aware of their surroundings (Soft surfaces, no date). Outdoor environment offers different features from indoors, early years practitioner who realise the outdoors nurture children's health and well-being. The outdoors offers children real experiences in real time, experimenting with natural materials. Children can understand the impact that science has in the outdoors, exploring volume, transporting and weight (Richardson, G. R. 2014)

The benefits of playing and learning outdoor allows the children to be creative, to explore the space, discover, being outdoors will enable children to test and challenge themselves through exploring and using their curiosity in the natural environment (First discoveries, 2022). Evidence has showed that learning in an outdoor environment decipher the child's full potential. Outdoors is unpredictable, which prompts the children to change how they interact with one another, learning in the real world provides children to react to the challenges that people face (Jucker, R. and Jakob, Au Von. 2022). Being outdoors will naturally support with gross motor skills, balance, dexterity and develop their co-ordination, when child explore outdoor, they are constantly developing new skills through trailing and error (CMOSC.org, 2023). When children are outdoors, they can move, explore, and stretch and learn how their body works and others around them freedom to explore and discover new skills, outdoors has natural materials for teaching wherever you are and what sort of area you are situated (Davy, A. 2019).

Gibson's affordance theory declares that every outdoor space has objects, surfaces, rules which provide children with different opportunities and affordances (Moreira, M. et al. 2023). Affordance is a term of opportunities and possibilities that is offered to children in the environment they are visiting. Affordances lets children to discover and explore with their different abilities. Children notice what is going on around them and offers the resources within the space (Davy, A. 2019). The approach to loose parts with regards to children's learning outdoors, using everyday objects instead of toys. The idea came from an architect Simon Nicholson who studied the benefits of loose parts. Lose parts should be readily available to children being on their level for them to be seen and chosen freely. Loose parts in the outdoors could consist of tyres, stones, sticks. The benefit of children learning with loose parts, is enhancing their creativity and imagination to create their own play, loose parts are also a benefit with mathematics and science learning outdoors. Getting to grips with loose parts play by Anna (2019). Loose parts are a variety 'loose parts' that can be moved around, counted, lined up to enhance creativity in play (Early Years Resources, 2020). Some children learn through schema's the transporting schema is good for loose parts, as children collect them and transport them around the room, they learn distance, journey's the loose parts can be any object they wish (Early Impact Learning, no date).

Outdoor learning is enriched with opportunities for Mathematics and science that can enable them to problem solve, children need to spend long periods outside, exploring mathematics outdoors allows the children to use the natural materials to discover the language and concept of maths. Science in the outdoors is observing and experimenting it answers questions from the learning inside the classroom. Children find the outdoors fun and enjoy nature, Adults can use their excitement, imagination to access maths and science outdoors, opening the children's minds up to the outside environment can make learning fun and relevant (NAEYC, 2017). Learning science outdoors engages the children using their practical skills, analysing, and making predictions in real time. Children have wider benefits from learning outside as it supports teamwork and the positive influence of the environment (Association Science Education, no date). Learning Maths outside feels real rather than disconnected from our lives. Children need time to make sense of the mathematics activities through experimenting and discuss the results whilst playing. Derek Haylock and Anne Cockburn stated that the reason for mathematics is the connection between the experiences and language (Robertson, J. 2017).

Using the outdoors for learning is beneficial for children it has a variety of opportunities for learning science. According to an Ofsted Study of children's experiences, the results where children learn best from hands-on approach and first experiences, it also contributes to their personal and social emotions. The weather can help with learning science outdoors as it provides opportunities to experience and discover with natural materials plus loose parts (Nicholson, D. 2020).

The role of the adult has a large impact on the child's learning outdoors, what may happen next and going forward. It is important that children are provided with the support for an enabling adult, to ensure the child gets the best out of the outdoor area (DCSF, 2008). The role of the adult whilst outdoors must have the same priority as in the classroom, having the same approach with the activities as inside, that the children get the best out of the environment and the task to be completed. Vygotsky's model of social learning recommends that the timing, how often and the quality of enabling adults are supporting the development of the higher order functioning. The interaction between a child/adult should become less so the child learns independence through their own play and imagination (First discoveries, 2022). The main role of the adult is to ensure the children have a stimulating environment and enriched areas of learning.

Identifying opportunities for maths development and co-operating maths into the enhanced provision, using the area to collect natural materials for sorting and counting. The adult needs to be a co-player to engage the children and expand their learning, it's a hands-on experience. The maths language needs to be introduced, when planning the activity (Dancer, J. no date). Practitioners supporting children outdoors need to ensure their well-being is healthy, support the child's learning as the child leads their own learning. The practitioner must recognise the opportunities for the children's learning, capture the child's learning outdoors (White, J. 2014). Practitioners and the environment promote well-being (Laevens et al, 2006), the children will become more involved, and their enthusiasm grows, the practitioner is to find the interest of the child through provision to enhance the learning and gaining new skills. Nature is a positive concept for children to value themselves and where they belong in the real world (White, J. 2011).

Concluding on outdoor play and learning the benefits are highly recommended, for children to spend a lot of time outdoors.

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