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Module code

ECEY 5005/C

Portfolio

***Awe and Wonder: science, mathematics
and the outdoors***

Content page

Part 1.....	3
Part 2.....	4-6
Part 3.....	7-11
Part 4.....	12-17
References	18-23

Part 1: Photograph



(source: saira ,2024)

Part 2: Trip to the local park

We began our learning journey with five students, heading to the local park. The children were instructed to dress appropriately for the weather, which, despite being the beginning of autumn, was dry. The dress code included rainproof coats and wellies. Accompanied by three staff members, we left the nursery, and our adventure began.

We formed a line for safety: one staff member led the group, followed by two children, another staff member, three more children, and finally, the last staff member at the end. Child 1, who was at the front with the leading staff member, imagined our line as a train. Excitedly, Child 1 said, "It's like a choo-choo train: 1 big box, 2 small boxes, 1 big box, 3 small boxes, and then 1 big box again," remembering the pattern clearly. The other children followed Child 1's lead, and by counting the "train boxes" and recognizing the pattern, the children began to grasp concepts such as volume and shapes. It was wonderful to see them connect counting and patterns to real-world concepts during our journey.

The local Ward End Park is conveniently close to the nursery, just two safe and quiet roads away. The roads were not busy, ensuring a secure walk for the children. We arrived at the park by 8:45 a.m., ready to explore its many play opportunities.

At the park, Child 1 and Child 2 quickly turned tree shapes into a pretend den, engaging in creative and imaginative play. The trees, with their natural bends, formed a path that the children used to pretend they were entering a visible den. It was delightful to see how they used their surroundings to spark creativity and play, having fun running in and out of the trees. A staff member then asked the children to spot signs of autumn, teaching them to observe the changing season and asking them to count how many signs each child could spot.

Meanwhile, Child 3, 4, and 5 formed their own group while Child 1 and Child 2 were busy running around. A staff member caught their attention by asking, "What sound can you hear when walking on the leaves?" Some children replied excitedly, "I'm making a crunch-crunch sound!" They began collecting leaves of different shapes and comparing them with one another. They noticed the differences in size and shape, which sparked a question from Child 4: "Why are the leaves different colours and not the same size as my friend's?"

A staff member explained that the colours varied because some leaves had just fallen from the trees and were still a little green, while the orange and yellow leaves had been on the ground longer. The sizes differed because some leaves fall early, while others fall when they are fully developed. Child 4's curiosity caught the attention of the group, and they all started laying their leaves in a line on the ground.

The staff encouraged the children to closely examine their own leaves, describing the colours and shapes. They also pointed out the abundance of leaves on the ground, explaining that this happens during autumn. The children learned that in autumn, trees and plants shed their leaves

in preparation for new growth, as the hot summer weather fades and winter approaches. The old leaves change colour before they fall, making way for new ones in the future.

The children then collected twigs to recreate the shape of trees, placing them on top of the leaves. Their faces lit up with fascination as they worked together, first gathering leaves and then arranging the twigs to bend toward the centre. The staff praised their teamwork. During the activity, one child spotted a yellow ladybug with black spots and excitedly called out, "Look, this ladybug is a different colour from the ones we've seen at nursery!" The staff gathered the children around to show them the unique ladybug, confirming its differences from the familiar red ladybugs they had seen at the nursery. The children were encouraged to differentiate between the two types, noting the colour differences. Some were mesmerized by the ladybug's unusual colour and watched it closely until it flew away.

The staff's observations at this point clearly emphasized the children's communication and language development. One of the staff members prompted the children's curiosity by asking thoughtful questions while they were collecting twigs to make the den. The staff member encouraged the children to use their senses, asking if they could smell the twigs and leaves. They also explored the sense of touch, inviting the children to feel the texture of the leaves and twigs and describe what they noticed. This helped deepen the children's sensory awareness and language skills as they articulated their experiences.

In addition to all the play and exploration, staff had prepared litter-picking essentials for the trip, as they do for all outings, to teach the children the importance of keeping the environment clean. Both the children and staff were equipped with gloves and litter pickers. The staff demonstrated how to collect rubbish and then asked the children to help spot any litter, testing their understanding of what is and isn't rubbish. The children found empty drink cans, bottles, and wrappers. The staff used the scaffolding method, guiding the children without interrupting their learning, and encouraging them to think about hygiene.

At the end of the trip, the children collected colourful leaves to bring back to the nursery for an activity. They sorted the leaves in order from smallest to largest. Another activity involved using sheets labelled "I can see..." where the children drew their answers, reflecting on what they had observed. This activity aimed to assess their understanding and memory of the day's experience.

In the early years foundation stage (EYFS) framework (2024), mathematics is an important area of learning for young children. It focuses on developing children's understanding of their mathematical understanding through activities that are hands-on practical and play based. Linking to the EYFS framework (2024) for mathematics requirement staff also encourages children to explore and expand their mathematical concepts in their surrounding environments.

Teachers also promote their love and curiosity for learning and build solid knowledge for their better future mathematical development. EYFS framework (2024) requirement for science is all about feeding their curiosity the right knowledge for development. Children need to learn about the basic principles of science, such as the properties of materials, the concept of cause and the importance of caring for the environment. The way EYFS framework (2024) requires teachers to spark children's interest in the natural world and make sense of the world around them, our staff in this trip answered children curiosity to keep them actively engaged to develop their scientific mindset so they appreciate the world around them.

Part 3 Risk Assessment

Location / Activity:	Wardend Park	Date:	27/09/2024
Assessor:	Saira Arshad	Review date:	30/09/2024

When completing the risk assessment, consider: what are the hazards; who might be affected by them; what safety measures need to be in place to reduce risks to an acceptable level; who will take responsibility for particular actions; what steps will be taken in an emergency?

Company	My Nursery	Age Group/Section:	Pre school
Venue / Meeting Space:	Wardend Park	No of children/young people:	5
Date of activity:	27/09/2024	No of leaders:	3

Experience exploring outdoor space in photograph	How will children 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	Creating road safety and awareness How to cross the road (red cross code) Explore the outdoor Promoting healthy living, by walking exercising	Other members of the public Children wondering off Running across the road Getting hit by a moving vehicle	Staff / Children	Staff ratio to children Staff wearing Hi-Viz Staff at the front, middle and back of the line (Saira, child 1, child 2, Tehreem, child 3, child 4, child 5, Misbah) Children walking in a single file Crossing safely, where possible to use traffic lights, zebra crossing to aid with crossing or member of staff to stand middle of the road and to stop cars so children can cross safely Children to look left and right before crossing Staff to follow route planned Suitable clothing and foot ware	L

Venue / Location	Experiencing the outdoor	Uneven ground Rubbish & dog mess Water hazard	Staff / Children	Pre-check area Check the area for evenness of ground Check for any rubbish or dog mess and clear away Locate activities away from water hazards Strategically place leaders to steer children away from hazards	L
Picking up different type of leaves	Exploring nature / colour / texture / Shapes Counting leaves	Cutting themselves / getting stung by nettles Getting dirt on their hands	Children	To have a first aider (Misbah) To take first aid kit and to check this before taking it out on the activity (Misbah) Staff to supervise children in small groups and to be visual of what children are picking – Saira and child 1 / Tehreem, child 2 and child 3 / Misbah, child 4 and child 5. Each group to have picker and a bags to put the leaves in and not carrying it their hands or pockets	L

Litter Picking	Looking after environment Looking at what material can be recycled	Scratches or cuts Getting dirt on their hands or clothes	Children	Children using litter picker To have different bays for recycling Staff to monitor their groups	L
Trial walk	Going on a trail walk,	Trip and fall Wear and tear on clothes by falling or getting caught by branches Hit by a branch	Children	Staff to ensure children are walking safely To be mindful of their surrounding	L
Wild life	Spotting different insects, wild life	Bite Picking them up or squashing them in their hands	Children	Pen and paper to write what they saw - Tehreem to ensure all stationery and paper is available Suitable equipment to take pictures Children not to touch wild life or insects using their hands	L

Stranger Danger alert	Children being aware of strangers	Other users of the park Stranger danger	Children/ Staff	Set up area for use respecting other users Remind children about 'Stranger Danger' Always ensure appropriate leader supervision – Staff to remain in their small groups	
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Approved by	Name: Laura Ashfield Role: Manager Date: 21/09/24 Signed: L.Ash	Trip Lead	Name: Saira Arshad Role: Staff Date: 21/09/2024 Signed: S.Arshad
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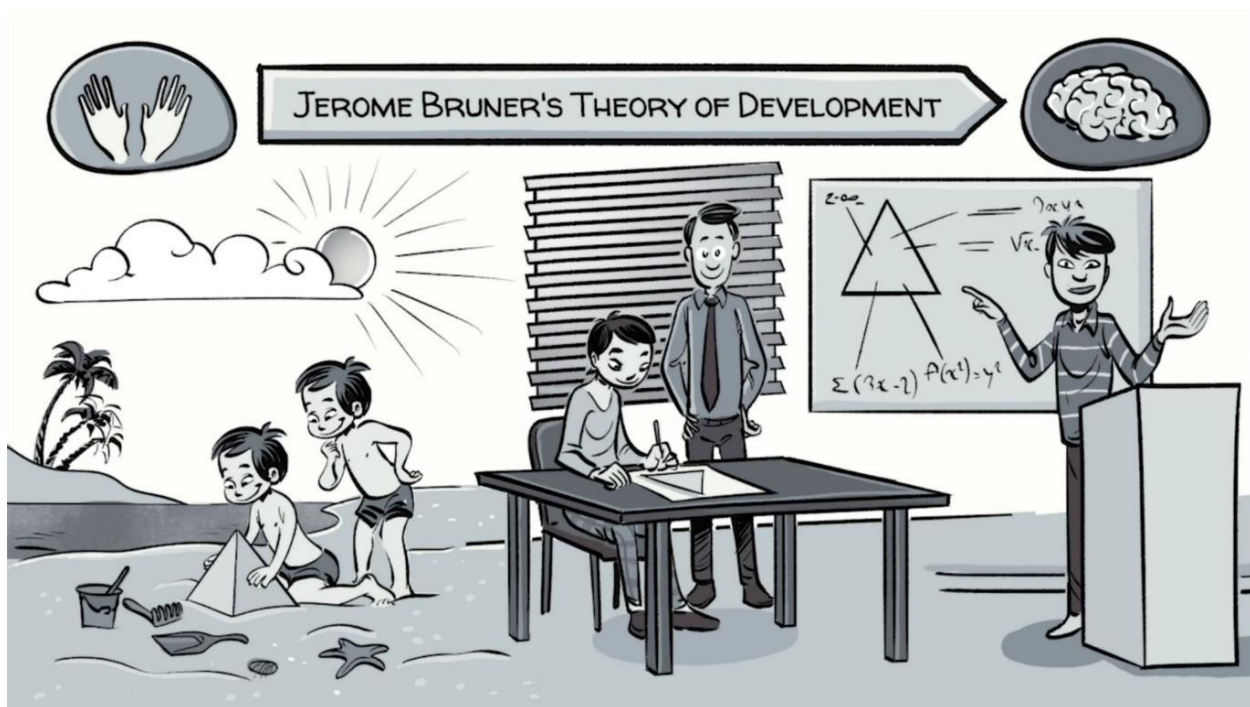
Part 4 Role of the adult support

According to Robertson (2017), there are numerous opportunities to teach and learn math in the outdoor environment. Nature provides affordances for learning and understanding math. She believes that the natural world offers children the potential to learn, think critically, solve problems, and make sense of their surroundings. Learning math outdoors helps children better understand the world around them. The ever-changing natural environment creates endless opportunities to explore math concepts, unlike the limitations found in a set curriculum. Nature enables individuals to use their abilities to comprehend the world. Robertson also adds that children grasp math concepts more effectively when they can see and feel them, which is possible in the outdoor environment (Robertson, 2017).

Mart (2023) mentions that math is one of the core subjects taught through activities in early years settings. Teaching children a deep understanding of math in the early years provides them with the best start in life and broadens their minds. Widada et al. (2018) agree that the outdoor environment offers opportunities for children to learn math by solving problems, which enhances their problem-solving skills. Research by Fagerstam and Samuelsson (2014) shows that learning math in an outdoor environment produces better outcomes than traditional book-based methods. Gurga, Ogul, and Arnas (2020) also found that using the outdoor environment to teach math helps children deepen their understanding and develop a variety of skills before entering formal education. The outdoor environment offers countless opportunities to discover new ways of learning. Their research also highlights that early year's educators should adopt more productive methods for teaching math within the learning environment. Furthermore, teachers' teaching methods should be tailored to individual children's understanding. The Ministry of National Education (2013) suggests conducting more math activities outdoors rather than in the classroom. Zippert et al. (2020) note that outdoor learning in math extends beyond counting, adding, or subtracting, encompassing concepts such as shapes, weight, height, and volume. However, Askar (2021), Ozturk, and Ozer (2022) found in their research that there are still too few outdoor activities related to math, as outdoor play often excludes math teaching. In another study, Gasteiger and Benz (2018) suggest that training educators will help develop more effective methods for teaching math through activities. Blomeke (2017) agrees that teachers should receive proper training to provide children with the best opportunities for efficient learning (Mart, 2023).

This highlights the importance of early educators training, so they are able to teach effectively.

According to Sargent (2015), outdoor learning enables children to think critically and solve problems, as it presents them with a broad range of concepts and experiences that promote mindfulness. The outdoors offers numerous opportunities for learning, allowing children to engage meaningfully with the world around them (Sargent, 2015).



(source: sproutsschool.com,2021)

The outdoors offers abundant opportunities for learning and play. Bruner (1966) and Piaget (1952) believed that children learn more effectively through experience. They posited that children add new information to their brains through physical interaction, which they later build upon and develop into deeper understanding. This theory connects to outdoor mathematics learning, as children grasp mathematical concepts more effectively when they can see, touch, and experience them through play. Nature provides a diverse range of options for children to interact with, allowing them to explore, problem-solve, and generate new, creative ideas in both math and science.

Engaging in outdoor activities, such as counting objects in nature, can enhance children's cognitive development, particularly in recognizing shapes and sizes. According to the Department for Education (DFE, 2014), outdoor learning is a key component of the early years curriculum, where educators are encouraged to provide activities that promote active learning.

These activities should help children gain knowledge and make sense of the world around them (Sargent, 2015).



(source: from-student-to-teacher,2018)

Davy (2019) sheds light on the history of outdoor learning in the United Kingdom, tracing it back to theorists such as Pestalozzi (1746), Froebel (1782), Isaacs (1885), and McMillan (1860), with many others following in their footsteps. Since the concept of outdoor learning was introduced in schools, it has sparked growing interest across all regions of the United Kingdom. Davy further

discusses the age of technology and how it has heightened our curiosity, encouraging us to delve deeper into research and exchange ideas on expanding teaching methods for children. She emphasizes the importance of bringing children out of the digital age, stressing that today's children are in our care and will grow up to become tomorrow's doctors and professionals. Educators must first understand that children are our future, and that nature has much to offer. Davy also highlights how nature plays a vital role in children's lives from a young age, starting when they are with their mothers, using their senses of security, taste, and sight. She adds that nature provides an affordance of play that fosters curiosity and critical thinking. In contrast, nurseries often have a set of toys that, while engaging, limit children's exploratory and thinking skills. In nature, children learn about numbers, shapes, and sizes through endless exploration. Nature-based learning can also be adapted for indoor classrooms, such as through "loose parts" activities. Teachers can implement these activities indoors if they lack access to outdoor learning spaces. Davy suggests that classroom environments can be modified to resemble outdoor settings by considering the materials provided and their potential to enhance learning through exploration. Teachers can support children's development by facilitating, observing, and engaging in sustained shared thinking. By bringing elements of the natural world, such as seasonal changes, fruits, and other nature-related resources into the classroom, teachers can help children develop a deeper understanding of the world. Teachers can also nurture a sense of place, belonging, and security by teaching children to care for their belongings, such as by hanging their items on pegs labeled with their names (Davy,2019).

Skinner and Stevens (2012) suggest that educators need to understand that children's comprehension of numbers varies from one child to another. Some children make sense of numbers by discussing them or experiencing them through play. Therefore, teachers need to keep this in mind when planning activities and be mindful of the types of tasks they assign. They should incorporate math vocabulary into play, evaluate the outcomes of specific activities, and design tasks based on the child's interests. Teachers should also support children in their learning journey by understanding their curiosity and helping them solve problems. The role of teachers is to create or design activities that help children learn numbers. This can be achieved by teaching them math vocabulary and using math-related words while the child interacts with the world around them. Teachers can encourage the use of numbers to name objects during both child-led and teacher-led play. Additionally, they can support number learning through games that involve numbers, making it more meaningful for children as they play. For example, activities such as counting the number of items in a box can reinforce math learning. Singing number-related nursery rhymes can also help children become familiar with numbers. Teachers

can further enhance math learning by helping children explore their environment, such as spotting numbers on license plates, following recipes with measured quantities, or counting household items. They can also incorporate shapes and sizes in activities, teaching children to observe the world around them. This exploration can extend into science, where children can learn about environmental factors like the air we breathe, the importance of keeping the environment clean, and how these issues affect humans and other living beings. Moreover, teachers can help children make connections between activities and their own lives. For instance, Skinner and Stevens (2012) provide an example of a child drawing a castle he received as a gift during a festival. After drawing, the child explained that the castle had many windows, while his own castle had only four windows. This demonstrates the child's understanding of size and numbers. Practitioners can also support learning indoors by labeling toys and other objects with numbers and names (Skinner and Stevens, 2012).

According to Bilton and Crook (2016), teachers should adopt these approaches toward children to teach them in an outdoor environment. Firstly, practitioners, as part of the adult involvement in the outdoor environment, should provide input and support for children to be present, so attitude comes first. Supporting adults' attitudes toward the weather, for example, requires teachers to set activities for outdoor learning regardless of the environment outside. Supporting adults must consider the situation or the time of year when children are learning in an outdoor environment, where adults need to show children by organizing activities related to the weather and ensuring that suitable clothes are worn by both adults and children. If supporting adults are calm and relaxed in every situation because they have arranged activities according to the weather and children's needs, their attitudes can contribute to the development of children physically and mentally. This, in turn, enables children to deal with all kinds of situations, which develops their problem-solving skills. Secondly, Bilton and Crook (2016) mention another way that adults can play a major role in supporting children with outdoor learning: "co-exploring." This means that adults need to be on children's level, exploring with them and allowing the children to lead. Adults can support children by interacting during exploration rather than taking over. Teachers should recognize the best times to engage with children so that their curiosity levels and thinking skills are not hindered. The teacher's role is to ensure they have knowledge about the outdoor environment and an understanding of what they are dealing with. Teachers who know their material and implement it in the right context provide the greatest support for teaching children in the natural environment (Bilton and Crook, 2016).

The Curriculum for Wales suggests that each setting should have its own approach to teaching, if the outcome is that the child can understand the world around them. Practitioners should have

broad knowledge to answer children's curiosity, because children who learn to find answers logically, with the right help from teachers, have a better understanding of the world. As stated in the Curriculum for Wales, a better understanding develops when children gain experience. The Science and Technology curriculum in Wales is designed to allow each setting flexibility in how it is delivered, if the required outcomes for children are met. Every setting is allowed to create its own curriculum, if learners develop according to the four criteria set by the Curriculum for Wales (2022).

According to Tovey (2013), the Froebelian approach emphasizes the role of the adult in a child's development. Froebel highlights this by stating, "The true educator and the teacher must, at every moment and in every demand, be two-sided. He must give and take, unite and divide, order and follow; he must be active and passive, decisive and permissive, firm and flexible" (Froebel, in Lilley, 1967). Tovey (2013) explains that observation is a key aspect of the Froebelian approach, where adults must observe attentively and understand how to use their observations to shape children's development. Froebel emphasizes that observation is not merely about watching children but involves interacting with them, reflecting on their behavior, and identifying issues where the adult can intervene to support their education (Tovey, 2013).

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