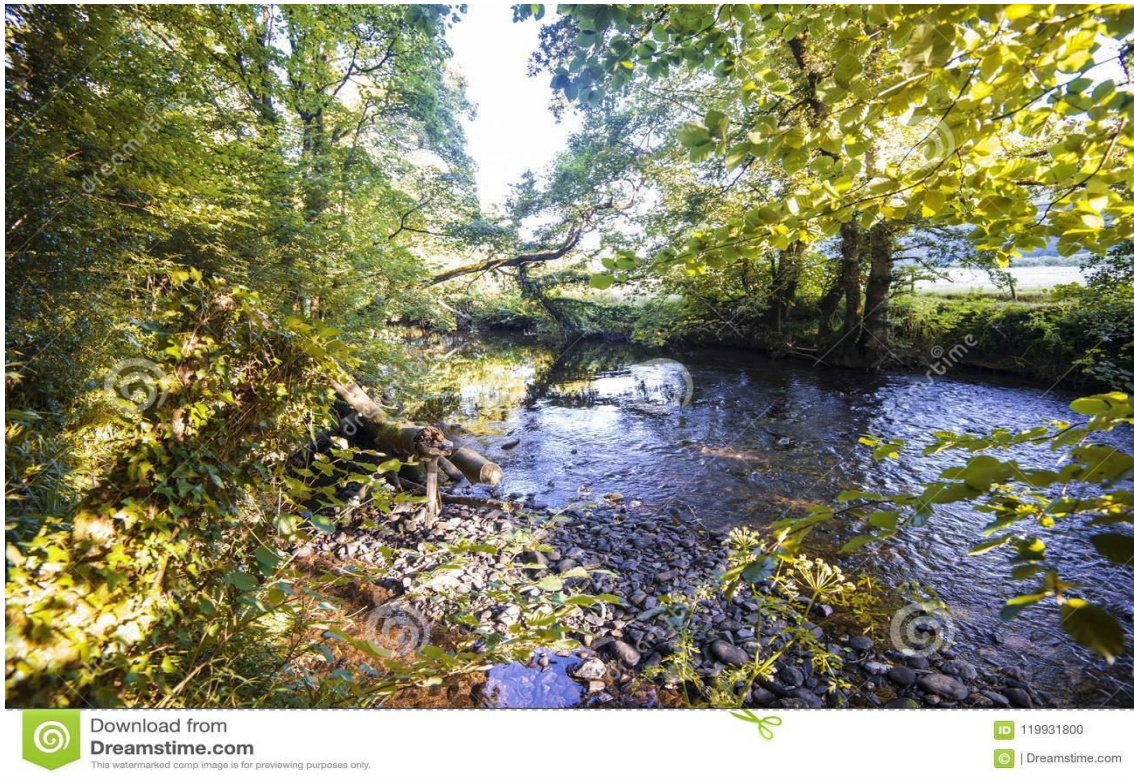




Source: Dreamstime.com

PART 2

This photo offers an environment a woodland and water where children were able to learn through outdoor play. The open environment provoked children's mind for exploration and wonder. Children were able to learn specific mathematical and scientific concepts, such the movement and habitats of the minibeasts, counting of the minibeasts. Learning in science and mathematics was promoted through play and sensory exploration, which supported children to develop a positive sense of the world around them

Research has established a connection between a child's physical and cognitive development, which is why by copying each movement of the minibeasts, children would be able to experience and learn whether a minibeast walks, slides, runs, or flies. Children needed to be involved in play, adventure, social interaction, collaboration, as well as children needed an adult who had knowledge and an adult who is enthusiastic and a good role model about mathematics and science in the outdoor world. Following Welsh Gov. 2015 where is written that young children need to be able to distinguish between non-living, alive, and once-lived objects.

Therefore, children's experiences in the woodland have been related to the Curriculum for Wales as well as a Curriculum for Funded Non-Maintained Nursery Settings where curriculums emphasizes that children learned that anything in nature can be counted and children learn by experience in order to discover scientific concepts about the way minibeasts move, where minibeast live and how our world works in general. (Welsh Gov, 2022; Welsh Gov. 2021).

First, to boost the sense of wonder in children about mathematics and scientific ideas and to encourage children about the minibeasts an adult read a book Mad about Minibeast before their journey in the forest began. The book encouraged children's attention and introduced new language. The children were shown the loose parts following the reading of the book. To inspire the children to join, the educators creatively arranged the loose parts and other materials.

Children were intrigued by the question of what sort of creature this woodland might contain. Children were fascinated of the loose parts needed for their investigation. The woodland and the water in the picture provided habitats for many minibeasts.

Children chased small animals by splashing into the river, climbing, and shaking bushes and trees, laying in the grass, or gazing up logs to see what type of mysterious creatures could be present, how many the creatures were, how many legs and how the minibeast move.

PREPARATION AND INSPIRATION

Although the environment in this picture is a forest, adults added some of the following loose parts that supported children to explore the affordance of their environment by playing with it. Therefore, the environment shown in the image would support the children's learning of mathematics and science along with loose parts and an enable adult:

- Clear containers for holding minibeasts.
- Spoons and small paintbrushes were being used gently to scoop up children's finds.
- Magnifying glasses.
- Binoculars
- White cloth was used under the trees and bushes.
- Nets for catching the water minibeasts.

Children interacted with these loose parts to have experience in experimentation, playful interaction, and exploration. Not only did the parts inspire children's imagination and creativity, but one adult also used the loose part to role-play as a detective eager to discover a minibeast treasure. Through these loose parts children learn how to read the nature and to have environment awareness about mathematics and science ideas.

Children were prepared to begin the hunt in the forest when an adult explained to them that little creatures must be handled carefully since they are delicate and easily squished.

To help the animals feel more at home and to give them something to hide behind, children added a few leaves to their bathtub.

INVESTIGATION AND EXPLORATION

Children began their research by strolling around the area. An adult took a magnifying glass in order to model and encourage children to utilise their best sleuthing abilities beforehand to track the creature down.

WATER

Children are always content around water. Water in the photograph has inspired children to search for minibeasts by using nets to catch them.

The excitement of the children was noticeable when some of them managed to catch mosquitoes, water boatmen in the nets. A few of the children noticed two dragonflies.

An adult: Oh, I am wondering what is moving around the water?

Child1: I think a sea horse is flying.

Child 2: Fly, fly, fly, so fast, can't catch it..

An adult: ohh I see could be a dragonfly!?

Child 1 and Child 2: oh yes, a dragonflyyyyyy.

An adult: how many dragonflies can you see?

WOODLAND

Children were fascinated to peek under large logs to find woodland and millipedes.

Children were so curious to peep into the cracks in the tree bark to find beetles or spiders.

Children were fascinated to poke their nose some of them used the binoculars, some of them magnifying glasses to see ants and grasshoppers.

Children caught the little beast on a white cloth. Children positioned the sheet beneath a branch and then gently shaken the branch. Ladybirds, shield bugs, caterpillars, and flies landed on the sheet. Children began to investigate the miniature animals. Children were utterly amazed and experienced such joy by the way that shaking the sheet exposed a variety of little creatures. Children placed the minibeasts into a tub and started describing minibeasts' movement and counting them.

Children started pointing: what is that? What is this? Is this an ant? Why does this ant have wings?

Adult: Oh I wonder how is this possible? A flying ant!!

Children started rushing toward the practitioners feeling proud of their scientific investigation and the variety of minibeasts they had discovered.

They began conversing while sitting on the ground and gazing into the tub, counting the number of minibeasts they had discovered.

Adult: Children, can you see the way they move, some have wings, some have legs...

Child 1 put its hands in the air pretending to fly and said: 'because they can fly.

Adult: Oh, Children, look what is happening? These bugs cannot fly.

Child 2: But these bugs do not have wings, they only can walk, they have legs.

Practitioner: Would you children know how many minibeasts you have already captured?

All the nearby children who were holding little tubs—some of which contained earwigs and woodlouse—heard the question and immediately began counting the creatures.

Children felt so confident and proud of their findings.

Two of the children made a song about the woodlouse and earwigs – running, running, rushing, rushing, running, running, rushing, rushing.

One of the children crawled on the floor then curled up into a ball like a woodlouse.

Children worked so hard to do their science and math investigation. Children loved it and found it challenging and their attention was completely engaged.

Two of the children were observing a grasshopper and one of the children dropped the grasshopper then the grasshopper leaped and both children started running after the grasshopper. Children were laughing and made a race with the minibeast.

Another group of children were fascinated of the worms. The children were trying to find the worms eyes and asking themselves question where the eyes were.

Child 1: This worm is so small; this is so big.

Child 2: I can not see the worm's eyes.

Child 3: I think the eyes are on the belly

Child 2: Where is the belly?

Adult: What do you think?

Child 2: I do not think that they have eyes because I cannot see them.

Adult: Well, done, children, you are great scientists.

Children were reminded to put the minibeasts back where children had found them after finishing their investigation.

In the end with the children were playing the game let's move like a minibeast.

PART3

RISK BENEFIT ASSESSMENT

Location / Activity:	Woodland, water	Date:	2.10.2022
Assessor:	Mirela Hayles	Review date:	2.12.2022

The boxes in the table below will expand as you type into them; pre-entered text is simply for illustration. You should delete irrelevant items and replace with text relevant to your circumstances. Your overall risk rating – Low, medium or high – is based on your judgement about whether the BENEFITS of the activity or opportunity outweigh the RISKS.

ACTIVITY	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING : L/M/H
Walking on the uneven ground	Supporting the vestibular senses of children, advanced motor skills, a lower obesity, better general health, and advanced motor skills, increased muscle power. Children encounter a variety of environments, including muddy, wet, and slippery ones.	Children could fall and get scrapes, bruises, and bumps. Children could slip or stumble, causing in wounds, scratches, injuries, or other accidents.	Children and Adults	Talk to them about how the surface might be an unique experience that they might like to explore. Suitable footwear. to walk carefully, to try lightly on the surface, to use a stick to try the surface before stepping,	M

ACTIVITY	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
Climbing trees	Children who climb trees get a close-up view of nature, and some children believe that being in trees makes them feel calmer. The senses are also stimulated by tree climbing. Enhances physical abilities like balance, hand-foot coordination, and flexibility as well as spatial and directional awareness. A fantastic approach to boost a child's self-confidence is to climb trees.	Tumbling or slipping from heights, branches breaking, dead branches, balancing on the fingers of another youngster, becoming caught, scrapes or puncture wounds from sharp points, and weak or fragile trees.	Adults and children	Put on the proper safety gear. Before climbing, check the stability and strength of the tree limbs. Never climb a youngster while holding something in their hands. Verify the location of any dead branches carefully. To empower children and support them in making decisions about the risks they take. Preventive controls reduce the possibility of major harm happening. Ensure that all children can identify a dead branch by its absence of foliage, bark, twigs, or the distinctive sound a dead branch makes.	H

Splashing and playing in the water	Water play gives children priceless experiences via hours of engaging enjoyment. Splashing, kicking, jumping and making waves are all activities that kids like. It fosters their imagination and creativity, supports their health and wellbeing, and offers opportunity for some fantastic scientific inquiry.	Limited visibility: Lakes and ponds might have murky water that conceals dangers like pebbles, logs, and uneven surfaces. Additionally, poor sight can make it challenging to observe if a child falls in. Go into uncharted water with your feet first and wade out cautiously. Drop-offs and depth. It can be	Children and adults	looking for safe place to play in the water. Discussing with children the uneven surfaces in the water. Discussing with children the risk of natural water. Adult checks the water first. Children checking the water with different size of branches. Suitable clothing, and shoes wearing.	H
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ACTIVITY	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
		challenging to determine whether children are entering water that is different depth.			

Touching different texture materials	Touching activates sensors in muscles and joints, which triggers messages to go from the skin to the brain. In essence, the brain receives a message every time your youngster touches something and makes a decision. manipulating various materials. Children can deepen their comprehension of the world around them by interacting with various textures. By interacting with a variety of forms and textures, touch helps children grasp what items are and how they feel. Children will learn how various textures—such as those that are sticky, thorny, smooth, and soft against their skin.	Plants that are poisonous, various sharp branches, and stinging nettles, minor cut by the rocks, allergic to leaves. Children may be scratched, poked, cut, or stink on nettle as well as pricked, chopped, bitten or rubbed.	Children and adults	Discussing with children in advanced different type of plants, textures of materials. Carefully touch different type of materials. Appropriate clothes and shoes.	
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ACTIVITY	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
Exploring Materials and their Properties	A child's early experiences are benefited by loose objects like twigs, leaves, shells, and sand because they foster creativity and imagination. Natural resources are readily available and motivate children to study the environment.	slippery grass, soggy ground, and walkways, sharp branches, sharp stones	Children and adults	Suitable clothing, shoes wearing, using gloves if it is necessary.	L

PART 4

A key aspect of this assignment to explore the ways in which adults could assess and motivate young children to learn mathematical and scientific with wonder and awe and through play in a natural environment (Wesh.Gov. 2021; Grigg, and Lewis, 2016; Waite, 2017). The photo in this portfolio provides every opportunity for an adult to plan an activity that incorporates the four goals from the New Wales Curriculum, for instance, children gain confidence when they are able to complete any tasks and see the results of children's mathematics and sciences activities, children displayed ethical behaviour when they looked after the minibeasts and the environment around them ,children would feel healthier when they moved and played outside, children in the activities work together and learn how to work as a team (Wesh.Gov. 2022). Furthermore, the Welsh government's "Enable Pathways, 2021" links the four purposes by establishing an enable adult, an engaging experience, and an effective environment in areas where these pathways are required not only for children to learn with wonder and awe but also to scaffold learners' growth (Welsh Gove., 2021 Enabling Pathways guidance). In other words, Bruner, Vygotsky, and Piaget all endorse adults scaffolding and supporting children's learning in situations where learning is an active process (Smith, Dockrell, and Tomlinson, 1997; Aubrey and Riley, 2018; Bruner, 1966)

Moreover, education is a process wherein a practitioner helps a child in understanding their inner world, but only a practitioner must first assist the child to experience and comprehend the outside world by interacting in it (Robinson, 2009; Stixrud and Johnson, 2018). In the same way Mequican and Russell (2016) emphasise the need for early childhood professionals to build this incredible environment where children might learn mathematics and science while using their hands and providing learning in this way to help children grow holistically.. Furthermore, White (2017), Rahardjo, (2019) and Atkinson (1998) recommend teaching math and science to children outside of the classroom; this will encourage them to use their imaginations and will make learning enjoyable and exciting. Bilton (2010) agrees with White and writes that practitioners teach children with wonder as well as pleasure by letting children play outside where children have space and freedom.

In order to assess and evaluate children during the mathematical and scientific activities in this portfolio, practitioners used sustainable thinking, which involved an adult and a child working together to solve a problem, for instance, an adult observed the child's body

language, carefully listened to the child when the child spoke, and watched closely what the child was doing (Brodie, 2014; White, Tinney, and Pitman, 2021). Alexander (2021) highlights that a learning process, educators must observe children as they learn, assess children in order to focus on progressing learning, plan learning in accordance with children's needs, implement activities that stimulate children's curiosity and sense of wonder, and then evaluate children in order to measure their progress. In addition Subordinate Legislation Resultant of the Curriculum and Assessment (Wales) Act 2021 said that assessment forms a comprehensive picture of the learner, including their strengths, learning styles, and development areas, in order to plan future learning and teaching efforts. For example, there are some approaches like Reggio Emilia and Te Wariki that use various assessment tools, such as learning stories or visible materials, although that both approaches aim to help educators comprehend and support the learning process and get familiar with how children learn (Davies et al., 2014; Campbell, Jobling and Howitt, 2021).

All fields of study, including math and science, involve creativity and imagination (Montague-Smith, A. (1997). Although some people believe that creativity only exists in the performing arts, visual arts, and music, and that why a professional educator, loose parts, and an outdoor setting are necessary to foster creativity (Robinson, 2009). Therefore, an excellent practitioner gets to know each child's unique needs and finds creative ways to encourage children's outdoor science and mathematics imagination (Bruce, 2011, Tunnicliffe, 2015: Sargent, 2015; Warden, 2012).

For example, White (2017); Johnson, and Watts, (2019); Knight, 2013 all believe that learning outside together with the adult build natural curiosity and wonder however what is more when children are outside children learn and understand about themselves and the world around them better. Atherton, (2014) agrees that outdoor learning gives practitioners more information about children's development of behaviour patterns which by observation can help practitioner better to understand the child's individual needs. Einarsdottir and Wagner (2006) highlights that when children play outdoor children bring both world real and fantasy in order to imitate and create new things. In other words, using outdoor learning teachers bring the curriculum to life and children are able to use their imagination to transfer the knowledge to the real situation (Ouvry, 2020; Watts, 2020).

Nowadays, however, there are misconceptions that to teach children mathematics and scientific concepts requires either electronic equipment or science with laboratory activities

(Murray,2019). Despite of these misconceptions science and maths are closely related to the children's daily life (Davies, 2014 and Devereux, 2007). According to Maynard and Waters (2014) practitioner needs to provide natural or any loose parts resources in order to provoke children interest because for example, when children have woods in their hands children learn in practical way through experience.

Similarity to Athey (2007) and Nicholson (1972) support outdoor learning of mathematics and sciences where children are able to experience the affordance of using loose parts as well as an enable teacher who easily designs learning process and stimulating children to manipulate affordance of the loose parts. Therefore, according to Tovey (2016) children can create in an infinite number of ways while using loose part materials as well as loose components can help with problem-solving skills, creativity, fine motor development, gross motor development, mathematical and scientific thinking, emotional literacy, and social development.

What is more, in the early years, learning through the senses is essential, and using all of the senses outside enables to form neural connections and organise information in the brain for later use (Richardson, 2014). Young children benefit from more interaction with the world when they are outside (Harding, 2005). So being outdoors stimulates all of their senses, such as hearing a variety of sounds, such as the rustling of leaves or the sound of an aeroplane overhead, and feeling a variety of textures, such as the gossamer of a spider's web, the sliminess of a snail's trail, or the roughness of tree bark and it is a place full of surprises and wonders (Woods, 2017). Therefore, this provides several sensory-motor skills that are concrete and can only be completely taught outside where there is a wide variety of tactile materials, having access to elements like sand and water, blocks, earth, and wood encourages visual, smell, and hearing interactions to enhance learning (Cremin et.al. 2015; White, Tinney, and Pitman, 2021).

Children learn best when they are moving, which is why being outside is so important for young children's not only physical but as well as holistic development. (MacKintyre and Mcvitty, 2004). So Gibson (1979) supports Mac Kintyre and Mcvitty's point of view that children experience forces and energy as they swing, roll, jump, hit, and bang items, giving children direct experiences with mathematics and scientific concepts (*Community Playthings* (no date). Therefore, children grow conscious of how their own bodies affect the world, including how cause-and-effect relationships, experimentation, and predictions and

hypotheses work (Macintyre and McVitty, 2004; Community playthings, no date; Bruce, 2011).

Most importantly, the purpose of this assignment is to review how practitioners by using creativity, wonder and awe to present maths or science through encouraging children to have different possibilities and opportunities of experiencing daily life to make connections with other ideas, ideas like involving the wild world from outside (Paund and Lee, 2015).

McGRATH (2010) believes that children learn through being told and playing with older children. However, Paund and Lee argue with McGrath supporting that understanding about science or maths outdoor need practitioners who provoke children to think and problem-solving and that children learn with curiosity not being told what to do. Creary and Wilson (2001) sum up that each child is a different individual and therefore lessons about maths and science need to encourage children to express their individual needs and interests.

Children learn science and maths better when teachers use wonder and curiosity because it gives them first-hand experience (Sargent, 2015). Aubrey and Riley (2019) express the same opinion like Sargent that Piaget, who believes that information must be experienced through all of the senses as children learn by using different resources and repeating activities - schemas. Tovey 2013 and Grimmer 2022 pointed out that each child has their own way of accepting the world around them. However, practitioners need to understand these many theories and how they might be applied in the teaching since different approaches can be used to better understand children's needs, practitioners are better able to comprehend how children learn areas like science and mathematics (Robson, 2019).

In other words, every child is able to understand mathematics and science if the educator uses the appropriate approach with each child because every child is different and has a special talent (Robinson, 2011; Cremin et al., 2015). For example, one of the approaches is a Reggio Emilia where the curriculum is flexible, children can direct their own educational experiences based on their passions, interests, ideas, and observations as well as approach aims to enable children to take responsibility of their education so they can enjoy their time in school and feel inspired to keep learning and growing (Smidt, 2013). Another theory is that of Vygotsky, who, like Piaget, thought that children learn actively and improve their knowledge and thinking skills through practical experiences as well as Vygotsky's idea claims that a child's engagement in social and cultural exchanges is what motivates the child to acquire knowledge and intelligence. However, Piaget's theory that there are stages of cognitive

development that help educators to assess and best support the learner as well as child's environment has an impact on how children grow and development (Smith, Dockrell, and Tomlinson, 1997; Piaget, 1957). Furthermore, practitioners need to link these theories into practice where children learn through play and practitioner enable to establish connections with children and design education that is personalized to each child's unique needs and abilities (Aubrey and Riley, 2019; Tomas and Lewis, 2016).

So according to Woods, (2017) adults must be able to identify by observation to promote science and math learning in both child- and adult-led learning in outdoor environment. White 2011 agrees with Woods that young children need to be surrounded by practitioners who are enthusiastic and who respect and love being outside. Edgington 2014 agrees with White that positive attitudes are essential, and adults create tremendous role models for young children. Tovey (2013) contrasts, however, that all theories from the past, such as those of Steiner, Froebel, Loris Malaguzzi or Te Wariki developed various types of practises and approaches to assess and evaluate children, but that all theories led to the conclusion that young children needed professionals who were acutely aware of the unique features of young children's learning and development.

Both learning areas science and mathematics according to the Curriculum of Wales educators must evaluate students' progress in these subject areas (Welsh Gov, 2022). Davies et al. 2014 and Drummond (no date) argue that children to gain developing skills in mathematics and science practitioner is important to focus and assess what children are interested in and able to do rather than what children are not able to achieve. Therefore, practitioners should underpin learning opportunities with a hands-on and minds-on approach to effectively support children developing in mathematics and science areas (Tovey, 2016; Campbell et al., 2021).

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