

AI: I can acknowledge the use of Microsoft Editor to spell check my work. I confirm that I have not presented any AI generated text as my own work.

Part 1 – Photograph



(Source: Brooks, 2024a)

Part 2 – Supporting Maths and Science in photograph

Area 1 – Stream

- The slow flow of water allows children to explore gravity. This can be investigated with loose parts using sticks and playing a game to see which will flow the quickest. There is opportunity to get the children to estimate whose stick will be the fastest and why by discussing the properties of the stick using vocabulary such as rough, smooth, big and small to get the children thinking. Sticks can be raced all in one go or can be timed separately using a stopwatch. Results can be recorded to discuss fast and slow timings.
- There are several rocks nearby which could spark curiosity if the children throw them into the stream causing ripples. Sizes of rocks could be explored to discuss the different sizes of ripples or splashes. Does mass or shape affect the size of splash or height of drop. Children to record or measure the splash.
- Properties of loose parts could be explored with relation to float and sink concepts in water and mud.
- Children may explore digging in the mud with sticks and compare the properties of the mud when dry and wet and depth of the mud and measure with a poke stick.
- Children may wish to put their hands and/or feet in the stream to explore the water and discuss the texture and temperature.
- Children could explore pondlife and life cycles in the pools of the stream.

Open-Ended Questions from adults

- Can you guess what will happen?
- What do you think will happen when you do this?
- How do you know it is cold?
- What do you notice about the rocks?
- Is it big/small, heavy/light?
- Why did your stick swim the fastest?
- What else could we add to make it different?



(Source: Brooks, 2024b)

- I wonder what will happen if there are rocks in the way?

Progression step 1 - Maths

I can make estimates and comparisons with measures, such as 'shorter than', 'heavier than'.

I can use mathematical language to describe quantities, and to make estimates and comparisons such as 'more than', 'less than' and 'equal to'.

Progression step 1 - Science

I can explore the environment, make observations and communicate my ideas.

I can explore the properties of materials and choose different materials for a particular use.

I can explore curiosity and question why things work.

Progression step 1 – Health and Well-being

I have the confidence and motivation to move in different ways and I am beginning to develop control of gross motor movements and fine motor movements in different environments, moving safely in response to instructions.

I can focus my attention and am aware of being able to do this.

I can recognise and follow rules and norms in the groups and situations in which I take part.

I have an understanding that things can be safe or unsafe.

Maths can be assessed by comparing the sizes of the sticks and rocks. By questioning, assessment can be made by discussing the texture of water, mud and loose parts. Children should follow rules near the water and move on the steps making decisions about their safety.

Area 2 – Logs

- Children to explore underneath the logs to search for minibeasts. Provide magnifying glasses to identify bugs found and count their legs for example and discuss their habitats and life cycles.
- Opportunities for children to test their physical strength by trying to move the logs. Physical skills can be developed such as balance and co-ordination, jumping, running and crawling. Positional language can also be used if giving instructions to jump over and crawl beside for example. Children working together, communicating, sharing and taking turns can increase children's holistic development.
- Around the area of the logs are smaller sticks and leaves that have fallen from the trees. Children can gather these and represent by counting or sorting into size order, colours and shapes.

Questions from adult

- What can you see?
- Is there another way you can do that?
- Tell me what you know about this bug?
- Have you seen anything like it before?
- How are they the same/different?
- How can you tell if it is real or pretend?
- Why do the leaves fall off the trees?



(Source: Brooks, 2024c)

Progression step 1 - Maths

I can investigate, collect and record data found in my environment.

I have explored, compared, and used the general language of shapes through investigative play.

I can use my experience of counting sequences of numbers and of one-to-one correspondence to count sets reliably.

I can count objects that I can touch, and ones that I cannot.

I can group sets into categories, and I am beginning to communicate the rule(s) I have used.

I have explored movements and directions, and I am beginning to use mathematical language to describe positions.

Progression step 1 - Science

I can show curiosity and question how things work.

I can explore the environment, make observations and communicate my ideas.

Progression step 1 – Health and Well-being

I can notice and communicate how I am feeling.

I get along with others with and without support.

I have an understanding that things can be safe or unsafe.

Maths can be assessed by counting and sorting opportunities and habitats and life cycles could be discussed. By questioning, assessment can be made by discussing potential risks of moving the logs and collaboration and if physical activity has an effect on their bodies.

Area 3 – Trees and Slope

- Lots of trees around can give opportunity for the children to discover light and shade under the cover of the tree canopies. Through the branches on a sunny day will give the opportunity to explore shadows created on the ground using the area around them or with their bodies.
- Leaves can be collected, and children will be able to explore the texture, size and shape and collect data through looking for patterns of symmetry, colours, shape and size and also differences and similarities. Children may wish to keep these leaves and return to setting to make a creative picture or imprint in clay. There is also an opportunity to keep the leaves and explore what happens to the leaves when they change colour, dry or curl up.
- The trunks of the trees around the area provide space to explore the texture of the bark and opportunities to make bark rubbings.
- The slopes in the area provide two different gradients for the children to explore depending on their level of interest or fear. Lots of opportunities can be explored physically for children to climb, crawl, roll and slide up and down the slopes and discover the difference in gravity. Again, the same but with loose parts to roll down the slope. These can be measured with the different sizes of loose parts and be measured in time to get down the slope. Estimations can be made at the top with language such as faster, slower and problem solve with an adult. Conversations could also be introduced about comparing the two different gradients of the slopes.

Questions from adult

- Where is the light coming from?
- Are your shadows all the same shape and size?
- Can we roll up the slope? Why is it harder?
- How does it feel?
- What do you notice?
- How could we make this better?



(Source: Brooks, 2024d)

Progression step 1 – Maths

I am beginning to recognise, copy, extend and generalise patterns and sequences around me.

I can make estimates and comparisons with measures, such as 'shorter than', 'heavier than'.

Progression step 1 - Science

I can show curiosity and question how things work.

I can explore the environment, make observations and communicate my ideas.

I can identify, follow and begin to create sequences and patterns in everyday activities.

Progression step 1 – Health and Well-being

I can make decisions on what I like and dislike.

I have an understanding that things can be safe or unsafe.

I can recognise and follow rules and norms in the groups and situations in which I take part.

Maths can be assessed on symmetry and patterns of leaves. Estimations on measurement of gravity. By questioning, assessment can be made discussing gradients of slopes and loose parts. Patterns in the texture of bark and shadows. Assessment of risk and safety, turn taking and following instructions and making decisions.

RISK BENEFIT ASSESSMENT

Location / Activity:	Blaen Bran/ Explore the Woodland	Date:	4/9/24
Assessor:	Clare Brooks	Review date:	1/9/25

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
Bark rubbings, stick collecting, explore shadows from trees	Gross/fine motor skills, discovering textures, counting, measure, ordering sizes. Discover light/shade and shadows.	Trees and low branches - scratches and eye injury.	Children, Adults	Talk to children about the importance of being aware of their surroundings and looking all around them. Point out low branches.	Low
Explore wildlife around logs and water area.	Children to look at habitats in nature, birds, bugs, pondlife. Explore life cycles.	Animal/insect stings, bites - allergic reactions.	Children, Adults	Children to be vigilant during session, advise children not to approach dogs and be aware of insect nests in the area. Check for children with allergies, supply of epi-pens and first aid.	Medium
	Risk taking, follow instructions, being aware of surroundings.	Nettles and thistles - stings and allergic reactions.	Children, Adults	Children are reminded not to touch or put anything in their mouths. Wear appropriate/protective clothing.	Low

Exploring the slopes with body and loose parts. Explore surrounding moving to different areas of interest.	Children to climb and experiment with different ways to get down the slopes. Different gradients to develop math/science skills, develop balance and co-ordination skills and physical development.	Uneven, wet ground - trip, fall slipping leading to bruises.	Children, Adults	Children reminded to be aware of uneven ground, slipping on wet surfaces. Point out areas and ensure caution. Children wear appropriate footwear, staff to help children in muddy areas.	Low
	Follow instructions	Strangers, members of the public - Child led astray/separation from group.	Children	Children reminded of the boundaries where safe to play and awareness of stranger danger. Correct adult to child ratios. Children supervised at all times with regular head counts. Children wear high visibility jackets to ensure quick recognition.	Medium
		Seeds, nuts, poisonous plants - allergies, ingestion.	Children, Adults	Check for children with allergies. Remind children not to put fingers in their mouth after touching plants, berries. Warn of plants in the area. Wash hands at the earliest opportunity.	Medium
		Litter, broken glass and sharp objects - injury, infection.	Children, Adults	Check area, remove litter, objects and dispose of them correctly. Children reminded of dangers of touching broken glass and litter.	Low
	Sensory stimulation, learning about weather systems, dressing appropriately, health benefits of being	Adverse weather - falling branches, slipping on ice, exposure to elements,	Children, Adults	Check the weather forecast before travel and monitor throughout the session. If weather deteriorates, seek shelter and return to setting. Appropriate clothing and suncream to be worn.	Low

	outdoors - physical/mental health.	hypothermia, sunburn.			
	Following instructions, being aware of surroundings.	Animal excrement - diseases	Children	Check area. Children reminded to be aware of excrement, to not touch or put hands near their faces. Ensure cleaning equipment is available and to wash hands at the earliest opportunity.	Low
Explore the stream with magnifying glasses, loose parts to race following the current.	Flow of water, gravity, speed, predictions	Water - falling in, slips, trips, cuts, infection, drowning. Concrete steps over water – slip, trip, fall between.	Children, Adults	Children reminded of the dangers of water and behaviour expectations. Adults supervise at all times. Children reminded not to run on bridge and take time to step over. Adult to supervise and help to walk over.	Medium
	Reinforce road safety rules, practice in real-life scenario, following instructions.	Walking to, from site - Collision with traffic, trips, falls, separation from group.	Children, Adults	Children reminded of dangers of the road. Children walk in line with partners keeping to pavements. Adults in front and end of group. Adults supervise crossing the road. Keep to ratios and regular head counts.	Medium
Exploring a new setting unfamiliar to children.	Large outdoor space to explore and follow interests.	Open access/other users of the site - Child led away, contact with public, falling trees.	Children, Adults	Children reminded that members of the public use space and be aware of 'stranger danger'. Children reminded of the boundaries set. Should there be any maintenance works taking place or the area is unsuitable, a different locality that is safe will be used.	Medium

Sticks, stones, rocks in water and ground. Children may pick up and transport around the area.	Problem solving, patterns, sensory experiences. Following schemas of transporting items around the area.	Small natural materials - falling onto children, cuts and bruises. Sharp points and rough edges, splinters and eye pokes.	Children	Children reminded how to safely transport items.	Low
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With every visit a suitable outdoor first aid kit is taken. A fully charged mobile phone with children's emergency contacts and details of medical history which is checked beforehand to be aware of any allergies. A register will be taken and ratios adhered to with one adult to every 6 children. If any children from the cohort have additional learning needs then an extra adult will serve as a one-to-one in the ratio to support.

This trip will consist of 26 children aged 4-5 and 5 adults to be in ratio. The lead teacher is responsible and aware of the emergency action plan if needed and will liaise with the school if a situation arises.

Part 4

Outdoor play remains an important part of early childhood provision in the United Kingdom and all over the world. Learning outdoors has been seen as essential for children's development, offering opportunities in many areas of learning providing a holistic development of the child. The role of the adult is important to observe, assess and reflect on children's learning and extend when needed by supporting and questioning children to allow curiosity and deeper thinking. This essay will explore the role of the adult in supporting children's development of maths and science outdoors focusing on the benefits of sustained shared thinking.

The importance of children being active in the outdoors and learning through nature was recognised by Froebel in the 1800's. MacBlain (2018) noted that Froebel was keen for children to explore challenges and to safely test limits and risk which would develop resilience, an important part of a child's holistic development. This is agreed by Bottrill (2018) who states outdoor play offers children potential to freely choose what to explore and takes risks as well as White (2011) offering that being outdoors contributes to children's well-being allowing them to interact and behave differently encompassing their holistic development. Challenges may occur in outdoor play such as the adult's perceptions of what is safe. Davies and Hamilton (2016) suggested that an element of risk was essential as it helps children to develop essential skills. Tovey (no date) agrees that adults need to juggle how to safely let children take risks and learn from their mistakes.

According to Waite (2011) the environment is a unique opportunity for play and learning rather than just physical play. Some practitioners have some outdated views that see learning only taking place in a traditional classroom. However, Maynard (2014) states that adults who understand the importance of outdoor learning have a great impact on children's education. It is the role of the adult to respond to children's interests and develop their learning in the moment. White (2011) suggests adults give strong messages when they value the outdoors as a learning environment. Children recognise this and are encouraged to explore when it is being modelled by an adult.

Hwb (2022) introduced Curriculum for Wales which supports learning through play and outdoors, promoting well-being as a core principle of the four purposes. This states the importance of children enjoying challenges, being able to question and problem solve, taking risks and developing confidence and empathy. Practitioners observe children's play and then use the progressions steps and four purposes to provide opportunities to extend children's learning further using their interests to engage and accounting for their

emotional development and well-being (Ouvry, 2003,). The curriculum for funded and non-maintained nursery settings from the Welsh Government (2022) further sets out areas of learning and development which details being outdoors as important for children to be themselves and make sense of the world around them. Furthermore, this document also states the importance of the enabling adult, who create environments where children feel safe to express their feelings and learn. Practitioners should model a joyful approach to learning and use teachable moments to observe and engage in their play.

Additionally, loose parts and affordance is important for practitioners to understand how children engage, explore and interact with their environment. Gibson (1979, quoted in Waters, 2017, p. 41) describes children using their imagination to afford objects and spaces into ideas that are not obvious to adults, especially in the outdoors where learning is not restricted. Furthermore, Brodie (no date) suggests that having rich, open-ended resources such as loose parts, can inspire curiosity and encourage children to communicate ideas and questions. Loose parts allows children to develop ideas and problem solving skills (Gorrie and Udah, 2020) making it an addition to the environment to promote maths and science concepts (White, 2011). Furthermore, according to Nicholson (1971, cited in creative star learning, 2024) all children of different abilities can use loose parts therefore it is inclusive for those with additional learning needs and children will explore at their own development independently. The adult can scaffold if needed to challenge the child in their play making sure to resist the urge to step in too soon, (Play Scotland, no date).

An equally important aspect of childhood provision is the role of the adult. Tovey (2012) inspired by the Frobelian approach suggests adults have a key role in observing children's interests, supporting and extending play and learning by conversing and allowing the child to build upon adults' answers by constructing their own explanations. Bruce (2001) believes that adults should take an interest but to be aware of how to support play without taking over stating that children need to become independent in their play. This can be achieved by scaffolding, a term used by Bruner (1976, cited in Aubrey and Riley, 2019, p. 126) who believed that adults should model or give cues to support and enhance learning when necessary, built upon Vygotsky's theory of Zone of Proximal Development. Vygotsky (1978, cited in MacBlain 2018, p.58) believed that with the help of a more knowledgeable other, children were able to learn more, especially when the adult differentiated learning according to their level of development.

According to Bilton (2010) children cannot have opportunities or experiences of learning outdoors without an adult's support or involvement which makes the role of the adult important. Adults need to be reflective practitioners, facilitate communication and

support challenging and risky play. When adults join children in their play, they feel safe, listened to and respected. All these are benefits of Sustained Shared thinking (Early Education, 2022). Questioning is important as the role of the adult to encourage children to test their ideas and explore multiple possibilities. According to Tovey (2012) Open questions help children to reflect on their thought processes and make connections, which allows the adult to gauge their understanding of concepts.

Additionally the Curiosity Approach (no date) says the role of the adult during sustained shared thinking is important using both verbal and non verbal communication to develop interactions with children by showing an interest and respect when listening and using speculation and open questions to assist children in their thinking skills. According to Siraj-Blatchford (2009) once this has developed with scaffolding from the adult, children will use sustained shared thinking with peers to collaborate and work together.

The outdoors can inspire awe and wonder and provides rich and authentic experiences for children to engage and connect with the natural world (Welsh Government, 2022). This allows children to develop skills for maths and science using natural open ended resources to enhance their learning by developing imagination and curiosity. Maths can be everywhere in the environment providing the adult can realise the opportunity and model language needed to explore (Tucker, 2014). Children need to be given time to explore, investigate and experiment while the adult stands back observing and facilitating learning when needed by providing open questioning or engaging in their play to initiate shared thinking (Purdon, 2013).

When specifically referring to adults supporting and encouraging maths and science it is important to consider the outdoor environment as essential to children's learning. According to White (2011) everyday materials and experiences serve as a starting point for development of mathematic ideas. Real, authentic resources such as telephones and clocks can promote learning by the children being engaged. Loose parts and big spaces can provide opportunities for children to explore maths in the real world to cover several concepts. Again this can be supported by the adult facilitating dialogue, investigations and explorations (Robertson, 2017).

By building upon a child's interests the adult can create opportunities for exploration by setting the area with resources that will engage the children and learning will occur. For example in the building area shapes and properties can be explored with blocks (Community Playthings, 2018). Robertson (2017) suggests a mix of resources, investigations and prompts to support maths in independent play; these could be organised into containers to sort by shape or size.

According to The Welsh Curriculum (2022) curiosity about science leads children to ask questions about the world around them. The role of the adult is to encourage children to question why and make sense of the world to develop their learning further. As stated in the four purposes, children being “ethically informed citizens” can consider their impact on the environment and have the responsibility to try to reduce it (Welsh Government, 2023). Children also need to consider living things in the environment and understand how things grow and develop and also how to demonstrate care, concern and respect (Cohen and Waite-Stufiansky, 2020). According to Brunton and Thornton (2010) Science is understanding the world around us. Children can develop a sense of belonging in the outdoors, begin to understand the world around them and reduce negative impact on the environment. Practitioners may want to set out a feature table that encourages observation to promote awe and wonder while being nearby to facilitate dialogue, explorations and investigations. Davies *et al.* (2017) suggest making the most of teachable moments such as exploring the weather while playing outside to introduce language and skills.

Sustained shared thinking [SST], as described by Siraj-Blatchford *et al.* (2002) happens when adults engage children through questioning aimed at deeper thinking and problem solving. It focuses on the more meaningful interactions that support deeper thinking and learning and is reliant on meaningful interactions between adults and children working together to to extend understanding or explore ideas (Brodie, 2014). The role of the adult is important to use open-ended questions to encourage children to think deeply by talking out loud or building on ideas. According to the Welsh Government (2022) these conversations, enhanced through effective modelling and questioning, can create an environment where both adults and children contribute together.

[SST] has many benefits to progress children’s learning and development especially when there is opportunity to spend time outdoors. This promotes imagination to explore curiosities and encourages children to take on new challenges by introducing new and extended experiences (Siraj-Blatchford *et al.* 2002). As progression develops [SST] can transition from being adult supported to becoming embedded in children’s play, then later collaborative play with peers (Purdon, 2013).

According to a research project The Effective Provision of Pre-School Education [EPPE] project (Sylva *et al.* 2004) highlighted that children made the most progress with cognitive development when adults engaged in open questioning and modelling skills when playing to deepen cognitive development. Practitioners respond to children’s interests and engagement by scaffolding their learning and enhancing the environment.

In conclusion, being outdoors provides children with authentic learning experiences and learning through play that cannot be replicated inside. The role of the adult can observe children playing, noting their interests and how these can be explored and developed. The adult can also scaffold children in their learning by supporting and questioning so they are able to explore their curiosities and extend their learning. Although faced with challenges from some practitioners, the most effective practitioner is able to provide an environment that is rich in maths, science and can contribute to children's holistic development.

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