



(The Empowered Educator, 2022)

Children learn a variety of new skills when playing outside. It allows them to build self-confidence, independence, and self-esteem. This allows children to become aware of their limits, boundaries, and challenge in their play. When children are used to playing outdoors, they are more likely to try new activities (Nidirect, no date). When children play outside it allows them to get their physical activity up on a daily basis. By having a regular exercise routine, it can prevent illnesses such as, obesity, heart disease and diabetes.

Whatever the weather, there is always opportunities for children to develop their science and mathematical skills through outdoor play. By allowing children to have time outdoors we are teaching them how to stay safe from a young age. Practitioners are able to bring children to areas suitable for play and allows opportunities for open ended questions for the children to decide if it is a safe area to play and why (Nidirect, no date).

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The Foundation Phase for Wales advocates an experiential, play-based approach to learning for children aged three to seven that includes child-initiated activity within the outdoor environment, (Maynard, T, Waters, J, Clement, J, 2013). In previous research, Foundation Phase practitioners maintained that children perceived to be 'underachieving' within the classroom came into their own when engaged in child-initiated learning out-doors. Following devolution in 1999, the Welsh Government set out proposals for a Foundation Phase (National Assembly for Wales 2001, 2003). While environmental education has not been a common topic in early childhood education, it has been proved that it is growing internationally regarding the need for environmental education to begin in life (Samuelsson and Kaga 2008). Wilson (1994a) stated that at the early childhood level, environmental education (EE) can nurture a child's creativity, sense of wonder and appreciation of beauty. In addition to this Wilson believed that children needed positive experiences with nature as it was important to not only understand the natural world, but to grow an understanding of who they are. There is evidence growing every day that suggest that experiences in nature can help aid in cognitive, physical, social and affective development during the early years of childhood (Lester and Maudsley, 2007; World Forum Foundation 2010). According to Baranowski et al (1993) from a physical perspective, preschool children are more likely to be more physically active during outdoor play than indoor play. Fjortoft (2001,2004) conducted research and found that when young children play and interact in a natural environment their gross motor skills increased in developed as well as their motor fitness, balance, and coordination than their peers in a traditional playground setting. These areas develop better due to more physical challenges and diversity within natural settings (Benson and Miller 2008). This allows children to take parts in activities such as climbing over rocks or jumping over sticks and puddles.

Until the

In this scenario it is based on water play. When we use outdoor water kitchens and mud kitchens it allows children to come up with different experiments. The Welsh Curriculum (2016) states that children learn through first-hand experience when it comes to activities. Through play, children are able to practise their learning play with ideas, experiment and problem solve. Practitioners must understand how

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children develop. This is not only to benefit the child but the practitioner themselves.

By planning and preparing it allows practitioners to plan appropriate curriculum where they take the children's development into consideration (Welsh Government, 2016). There must be a structured learning thorough child-initiated activities and those directed by practitioners. In this case the practitioner can come up with an experiment of, 'what happens when you jump in a puddle'.

This experiment can be based on different types of jumps into a puddle, whether it is one foot or two feet, or splashing in the water. This can all lead to different questions such as, why it ripples, why do some puddles make bigger splashes than other or why do puddles disappear. This can then allow children to develop their own theories and experiments that they can try out at home. This allows children to widen their scientific development as it will develop their thinking across the curriculum through the processes of planning and reflecting. This helps them gain a deeper understanding and enables them to explore and makes sense of their world states the Welsh Curriculum (2016). This activity helps with scientific and mathematical development as it enables children to think creatively. This allows them to measure, weigh and pour the water which allows the children to think for themselves and work as a team. It helps children begin to understand physics in science. This allows children to understand sink and float notions. The addition of a water table in the outdoor play area allows children to investigate which objects that float in water and which ones sink. Practitioners can use different objects such as feathers, balls, pebbles and vegetables and the children can use a chart to guess which ones will float or sink.

By playing with water, it helps to enhance gross motor skills and physical fitness through lifting, pouring, carrying, running and splashing. It also helps with squeezing and develop muscles in children's hand. This can also lead to an experiment that practitioners can do with children where they look at why sponges absorb water and how the water leaves the sponge when we squeeze it. Children learn lots about measurement through water play. Practitioners can use different containers, with different shapes and sizes to the water table and the children can compare the volume. They are able to guess and see which one fills up the fastest and which shape and size holds the most water. The Welsh Curriculum (2016) states that children develop their use and understanding of mathematical language in context

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through communicating and talking about their work. This means that children can learn about terms such as half full, empty, full and less. This activity also gives the children the opportunity to talk to each other about their work to help develop their language skills.

Weighing scales can help children to learn about density and volume, for instance, a bucket of sand may not necessarily occupy the same amount of space and weight the same as water. This leads to the children asking open ended questions and helps them to engage in the activity and not get distracted. By doing activities that encourages children to ask open ended questions it lets them use appropriate mathematical language to explain their thinking and the methods that they are using (Welsh Curriculum,2016). The Foundation Phase adopts a fairly traditional view of development which is an approach Anning, Cullen and Flear (2009) maintain, is embedded within the institutionalised thinking of early childhood education in the UK. The Foundation Phase Framework (DCELLS, 2008) supports the use of outdoor environment. For example, it is maintained that outdoors children are able to move more freely, play on a larger scale and experience at first hand the world around them, (Rivkin 1995; Bilton 2002; Ouvry 2003).

RISK BENEFIT ASSESSMENT

Location / Activity:	Bynea Primary School Outdoor Waterplay	Date:	25-03-22
Assessor:	Meghan Owens	Review date:	06-06-22

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
Contact with soil	- Exposure to beneficial bacteria to build health, functioning immune system - Sensorial open ended material - Normal childhood experience	-Eating soil	The children	- Make sure there is hand washing stations during play - Practitioners are monitoring play to make sure no soil is ingested	Low
Puddle jumping	Allows children enhance their gross motor skills and coordination	-Do not know the depth of puddle - There could be rubbish at the bottom	The children	- Use an object to measure the depth of the puddle. - Make sure there are 2 adults to supervise.	Medium

Water play	it will enhance their mathematical skills Children can explore mathematic concepts such as amount, volume and equivalence.	-Jugs of water could be too heavy to carry -Water can be easily spilt	The children	- Make sure that the children are measuring the right amount of water into the jugs. - Make sure there is practitioners present to supervise the children - - make sure there are small mops for children to use	Medium
Water play	-Fine motor skills and hand eye coordination are refined -Children can practice pouring, squirting, scrubbing, stirring and squeezing. It allows them to explore how and why	-The water can be colder than expected, even in warm weather.	The children	- Make sure water temperature is checked before children go outside to play. - Add warm water if it is too cold.	Medium
Water play, Trays/troughs/sink/buckets/containers	-Children engages in scientific exploration relating to water, movement mathematics, capacity, comparisons. -Water can have a calming effect on children.	-There is a risk of children falling into water trays, buckets, sink or trough.		- Children will not be allows to climb on the sides of the water containers. - Close supervision is maintained at all time during water play experiences.	Low

Washing up children	-Children will learn hygiene and can make it fun	-Wet floors -Slips or falls	The children and practitioners	- Make sure each child washes themselves - Make sure there is a hand cleaning station includes a bucket and soap - Make sure there is a towel or tissue paper to dry hands	High
Water play	-Improves language development. -There is a positive outlet for pent up energy	-Risk of skin irritation from additives (glitter or bubbles)	The children	- Parents are expected to notify the practitioners of any allergies or irritants to consider the previous to adding potential irritants	Low
Water Play	Introduction to physics (flow and motion)	Drowning	The children	- Practitioners should be positioned near all bodies of water to ensure that no child or children places their head in the water - Bodies of water to be tipped out and drained at the conclusion of water play.	Moderate
Water Play	Introduction to chemistry development (adding solutions)	-Medical conditions such as grommets effected by water exposure -water becomes dirty and	The children	- Parents will be asked to inform the service if there are any conditions relating to their child and waterplay and will be asked to provide ear plugs if necessary - Practitioners will familiarise themselves with each child's and their medical conditions (if applicable)	Medium

		contaminated .		- Water is changed as frequently as necessary	
Water Play	-Aids in development of fine motor skills -Improves hand eye coordination: watching and doing -Can aid in building immunity	-There are slip and trip hazards	The children and practitioners	- No running activities to be undertaken in the same areas as waterplay is undertaken - Shoes will be removed where possible to avoid tripping	Medium
Water Play	-Promotes creativity and imagination through role playing and small world play. -Sensory development -Language skills	-Skin irritations from sand and or water -Heat/ Sun exposure	The children	- Children will be encouraged to notify practitioners if or when irritation or itch begins. Excess sand will be washed off children's skin after play or upon request. - Parents will be involved of the activity the child/children are taking part in and are required to have appropriate 'SunSmart' clothing including a hat and sun cream on. - Practitioners will reapply sun cream before the activity per policies and procedures. - Children will be encouraged to drink water frequently especially when playing outside.	

Sprinkles / Hose play	-Social development: problem solving, sharing and communicating	-Tripping over sprinkler	The children and adults	- The sprinkler will be placed in a position where it is clearly visible and practitioners should notify the children when it has been put out. - Once the activity has finished the practitioner will put the sprinkler away immediately.	
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Level of Risk

		Likelihood				
		Rare	Unlikely	Possible	Likely	Almost Certain
Consequence	Critical	Moderate	High	High	Extreme	Extreme
	Major	Moderate	Moderate	High	High	Extreme
	Moderate	Low	Moderate	Moderate	High	High
	Minor	Low	Low	Moderate	Moderate	Moderate
	Insignificant	Low	Low	Low	Moderate	Moderate

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Above is a level of risk where the likelihood of the risk and hazards are likely to happen. As shown above the overall risk is moderate. This means that there is likelihood of serious injury, welfare or health care issues and serious disruption, resulting in distress to children and adults. When reviewing the risk assessment, I have come to the conclusion that the benefits of the water play activity do outweigh the risks and hazards of the activity. This activity will benefit the children's science and mathematical development and allows free play to take place. Based on the benefits of the activity and as long as they controls and measures are followed these risks and hazards can be controlled and avoided.

Piaget believed that children act as 'little scientists,' this is by exploring their environment to gain understanding. He believed that children do this in their day-to-day life, without any adult intervention. He found the idea of distinct development stages through which children learn language, memory, and reasoning. It is believed that Piaget's stages of development are a theory about how children learn as they grow up. Each 4 stages come with different milestones and skills. (Sherrell, Z, 2021) Th first stages of Piaget's theory was sensorimotor, this was between the ages of 0-2. This happens when babies start to build an understanding of the world through their senses by touching, grasping, watching and listening, Sherrell,Z, 2021). They also start to see objects and understand that objects exist even if you cannot see them. At this stages babies use their five senses to communicate and use basic actions like waving their arms and shaking their head. At this stage children begin to gain an understanding of cause and effect of something. Children will start to

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understand that when they do certain actions will lead to a specific outcome and will use this later in their future play. A child who understands object permanence will know their caregiver is still there when they are playing Peek-A-Boo and they begin to create a mental image of the object or person and begin to realise that they exist even if they cannot see them. (Sherrell,Z, 2021).

The second stage is preoperational and this ranges from 2-7 years of age. This is when children develop language and abstract thought. This allows children to think about certain ideas that are not physical. At this age they also start to engage in 'pretend playing' this can be from drawing pictures and talking about things that have happened in the past. During this stage there are five key behaviours that children start to display during this period:

The first is imitation. Children can now mimic another person's actions and memorising them.

Then there is symbolic play. This is when children assign symbols and characteristics to objects. This is when they begin to use their imagination and may start pretending that a stick is a sword.

The third is drawing. The first two key behaviours play a massive factor and meaningless scribbles begin to turn into more accurate drawings of the object and people.

The fourth is mental imagery. Children begin to familiarise objects in their mind and begin to ask names of objects to understand a wide range of things.

The final key behaviour is mental imagery. This is when children start to use words to describe objects that they have seen in the past or present.

Piaget believed that children remain egocentric throughout the preoperational stage, (Sherrell, Z, 2021). At this stage children will not understand that others think in a different way that they do.

The third stage is concrete operational. This begins to happen from the ages of 7-11. At this stage children begin to learn physical rules about objects based on their weight, height and volume. They also learn that the object is still the same thing even if it appears different. Piaget (1936) theorized that at this stage, children start to master abstract and begin to become less egocentric. They begin to understand how other view things differently than they do. This stage centres around three elements.

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There is conservation and reversibility. This is the understanding that objects are able to change volume, appearance and size but the object is still the same.

Then there is classification. This means that children are now able to put objects into specific groups that can be based on their size, shape and texture.

The final phase in seriation, this is when children begin to realise objects based on their importance, height or weight. This is important for children mathematical and scientist education (Sherrell,Z, 2021). Adults are able to help children develop their mathematical and science development based on this by using water play and setting tasks. Some tasks could be organising crayons and ordering toys from smallest to biggest.

The final stage of Piaget's theory is formal operational stage which is 12 years of age and above. Piaget believed that this was the final stage of cognitive development (Lourenço, O. M. 2016). At this stage of development children are able to understand how things work and they learn to solve problems. Within this stage children are able to begin to understand their environment and learn to analyse and make decisions. Children also learn how to create their own theories and can predict what will happen in there future based on their existing knowledge. Marwaha, S., *et al.* (2017). Adults are able to encourage children to develop their maths and science by helping them create their own theories and allow them to create their own experiments.

The Foundation phase framework (2008) states that it is important that children experience child-led play as it is important for children key development and understanding. Practitioners must show enthusiasm when it comes to learning about mathematical and science skills outdoors. Although showing enthusiasm is good it is also vital that practitioners makes as much of an effort with outdoor activities when it comes to planning their resources like they do with indoor play. As seen in Piaget's theory it is crucial that children experience child-led play as it is important and enhances their development.

Adults supporting children during outdoor play is vital for enhancing children's learning but also through adults observing a child. By observing children adults are able gain a sense of who the child is (Aurora Early Education, 2021). This means practitioners are able to gain and understanding of the children's likes and dislikes and should ask open ended questions when interacting with the children so that they

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are still encouraging child-led play. If an adult wants to play or participate with the child or children it should be up to the adult to allow the children to take lead of the play especially when it comes to role play. The adult should be willing to invest their time in what the child or children want to do when it comes to particular activities. The quality of a children's play is greatly influenced by the adults around them. Adults can provide materials and encouragement and open the door for new activities and learning (Early Years, no date). The role of the adult is to support, enhance or extend play, but if the adult interferes then it stops the play. Play is a natural way in which children learn and adults can support this by allowing child-led play. To many adults, maths and play should not go together. However young children are learning maths all the time through play experiences. Maths is everywhere within the home as children learn to know and understand math language of shapes, spaces and numbers. Adults are able to support this by setting up counting activities for their children but allowing the child or children to do it in their own time. Young children have many mathematical experiences in their home environment. For example, they learn about money when they go shopping with parents and adults can support maths in this sense by allowing the child to count the pennies. Children also become aware of numbers when they count how many steps there are on their way to bed. Adults can also support young children's mathematical development by doing outdoor activities such as sand and water. Adults can encourage children to engage in mathematical activities using this activity as it helps teach them what is heavy light, big or little through the medium of maths but it is fun and enjoyable. The Foundation Phase (2008) states that developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. Adults are able to support this by doing activities that involve counting blocks, toys or objects.

Adults can also help support scientific development in children and can encourage them by planting seeds. Adults can use this activity to help children gain and understanding of the life cycle (Early Years). It allows children to learn how plants start from seeds and how it uses the sun and water to grow. An adult's role is crucial

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to children's science learning, and it is a complex one that is informed by the adults knowledge of the child or children (Worth, K, 2010). Under the Equality Act (2010) practitioners must follow their legal responsibilities including fair and equal treatment regardless of the children's race, age, gender or disability. Science is knowledge that represents current understanding of natural systems and the body of knowledge. Both elements cannot make progress in science without an understanding (Duschl, Schweingruber, & Shouse, 2017, p26). Adults within this environment are able to encourage scientific development by creating outdoor activities such as water play that will encourage children to think outside of the box and discuss between themselves what they think is going to happen. Adults can also encourage development by exploring and finding answers together and this still allows a child-led play. If a child asks a question such as 'what happens when you jump into a puddle' adults are able to stimulate an answer by stating that they do not know and they should find out together (Lan, Y.C). This allows children to think of more questions and figure out if a small puddle makes a bigger splash than a large puddle and why. Adults can also support children by allowing messy play. Whether it is outdoor exploration with mud and sticks children are likely to get dirty and this allows them to role play with what they find and refer objects to. Science learning begins with curiosity. By observing and questions the children it is allowing adults to create a climate of discovery and helps the children gain a level of excitement that will encourage them to find out more (Lan, Y.C). Children can learn a lot about science especially when it comes to outdoor water play. Adults should let the children ask their own questions, but adults can encourage curiosity. For example, if practitioners place objects in the outdoor sinks that float adults are able to invite the children into thinking what other objects can float and this way adults are supporting scientific development. This will stimulate questions such as, 'why does this float' and 'why does this sink' which encourages children to figure out why object float and why. (Worth, K, 2010).

Adults should also encourage children to record what they have learnt. This could be by writing, drawing, or taking pictures and this is an important scientific skill. By keeping track of what they have learnt, adults are giving the children the opportunity to remember what they have heard, discovered, and saw (Lan, Y.C). the goal of science and maths is to understand the natural world through the process known as

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scientific enquiry. This knowledge allows us to explain the world around us and gives children the opportunity to explore it for themselves.

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