



(Early Years Careers, 2016)

Taking children out of the classroom and giving them the opportunity to learn outdoors can provide children with more knowledge and understanding of their natural environments. Taking children outside can teach them things in real life scenarios which has more benefits than classroom teaching. It has been noted that a child's development should not be seen as something the child owns but it should be seen from their interactions and participations with their cultural environment (Maynard T et al, 2013). There are many benefits to outdoor learning. It has been said that through the practise of outdoor learning children develop both inquisitive thinking and be ready to approach real-life problem-solving issues, encourages a child's holistic development, allows children to recognise hazards and risks, lets children begin to appreciate nature and all living things. Outdoor learning will also benefit children both physically and mentally. Outdoor learning can improve a child's mathematical skills and their science skills also (Independent School Parent, 2021). Allowing children to learn outdoors can reduce the risk of obesity and weight related issues such as diabetes and coronary diseases in children (Children's Hospital of Philadelphia, 2020). The Foundation phase outdoor learning handbook states that outdoor learning will develop a child's personal, social development, well-being and cultural diversity. It will also aid the development of a child's language, literacy and communication skills, for example, allowing children to go on word hunts and form sentences with the words they have found, outdoor learning can also develop a child's mathematical development, for example, in a mud kitchen children can weigh out and measure the amount of mud and water they need to make the perfect consistency of sticky mud. Outdoor learning can use fine motor skills when children

need to measure certain 'ingredients' and it also allows child's creative development to progress (Welsh Assembly Government, 2009). Although environmental education has not been a popular topic throughout early childhood education it now appears to be gaining popularity throughout the world as people now realise the benefits of environmental education at early childhood. There is a vast majority of evidence which shows that children who play in natural settings have better cognitive, physical, social and affective development from an early age. Research shows that young children who play in natural environments had a further increase in gross motor skills, motor fitness, balance and coordination when compared to their peers in a typical playground setting children appear to be more physically active during outdoor play than indoor, it has been suggested that this is due to the challenges children will face when in a natural setting, such as, climbing over rocks, jumping off tree stumps and ducking under trees/ avoiding branches. (Julie Ernst & Ladona Tornabene, 2012).

The scenario in the picture above will use both mud and water play, this type of play will encourage a child's maths, science and literacy skills to develop while they play. Allowing children to play freely with these materials will let their creative development excel. During this activity children will have the opportunity to express their creativity, increase their fine motor skills all while practising literacy, science and maths. Mud can be used as a tool to create art while children. This scenario allows children to feel independent while also knowing they have peers around who they can communicate with at any time. Children may also work in small groups during this activity which encourages cooperation skills. During this activity a child's curiosity will excel while also allowing the children to gain a sense of responsibility for their actions. This type of scenario is inviting for children as they will be experimenting in mucky play making them eager to engage in the activity and get stuck in. In the right-hand corner of this photograph children may use the mud and water to create volcanoes with water dripping down or castles with a moat around it. This will require the children to use their mathematical skills to correctly weigh how much mud they will need for whatever they are building without it toppling over and having to restart. They will also need to carefully measure how much water they need without ruining their desired consistency of the mud which will link in with their science skills. The Welsh Curriculum (2016) states that children will understand the mathematical context of things through communicating with one another, for example, asking each other questions such as 'how many cups of water did you use' and 'how many buckets of mud did you need'. Effective language skills can be a helpful resource for children to understand all aspects of the curriculum. Next to the mud pit with water there is a red bucket with a hose. This will allow children to use their science knowledge and see what happens when water is frozen, it turns into a solid state, when water is boiled, it turns into a gas, and what happens when its at room temperature, it is a liquid. Without realising it children will learn valuable scientific properties. This bucket and hose will also allow children to investigate what happens with different volumes of water. Why a small cup makes a small splash, why a big cup makes a greater splash. Opposite the bucket we can see some powders and sands in pots with two trays in front. Here, children will be able to mould or carve things in the powder. They can test to see if the powders and sands form into a ball when adding a slight bit of water, testing their motor skills. The pots and pans located next to this will allow children to experiment 'cooking' with this the children can also make 'pancake mixes' to put into the pan take it into the kitchen and find out the result of what happens the pan gets hot. Playing with the powders

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and sands provides a sensory experience for children as they create patterns, mould or let the powders slip through their fingers.

Activity Early Years ECEY5005	2004241 Benefits	Hazards Identified	Risk Assessment	Control measures/procedures
Water play with bucket	During this activity children will be developing their science and maths skills while exploring with water such as measuring how much they will need and looking at different volumes of water.	In this activity there is the potential risk of children slipping on the floor due to water spillage	6	To prevent a child from slipping on the floor the practitioners will ensure that non-slip mats are used, and all puddles will be mopped up instantly
	Allowing children to explore with water can have a great calming effect on them	There is risk of a child falling into the bucket	2	Prior to the activity children will be given a talk on safety and be encouraged to tell practitioners if they see any spilt water or puddles
	This activity will give opportunity for a child's gross motor skills to develop	There is risk of a child irritating their skin with the powders which can be added to the water	2	Children will be warned not to get too close to the bucket and/or lean on the bucket at any time. Each child will be closely supervised during this time.
	Children will begin to see what happens to water when it is poured, stirred, tipped and thrown	There is risk of a child drowning during this activity	6	Letters will be sent home to parents prior to the activity taking place, this letter will ask parents to note any allergies or skin issues for the practitioners to be aware of prior to the activity.
	Children will get to see how things happen and can be explained why they happen			
	This activity will allow children to burn any energy they might have carried into the classroom	There is risk of a child with medical conditions being affected by the water exposure	6	Each station will have a practitioner next to it ensuring children do not cause harm to themselves for example, placing their head in the bucket
	In this activity children will be using their hand to eye coordination when tipping water from one cup to another, developing their fine motor skills and also their	There is a risk of water becoming grimy and polluted	2	As stated above, letters will be sent home to parents prior to the activity taking place, this letter will ask parents to note any medical conditions which may be affected during this activity. At the end of the activity any water will be disposed of correctly.

	mathematical skills as they measure carefully how much water is needed in each cup. During this activity children will be introduced to different elements of science, for example, the motion of the water and making solutions with water During this activity children will be able to get hands on with water.	While children are getting stuck in with the water there is a potential risk of the children's clothes getting wet and/or dirty resulting in the child becoming chilled or unwell.	2	As stated above, in the letters parents will also be asked to inform the practitioners of any reason as to why their child may not be able to participate in the water play. The letters will also ask parents to provide earplugs if they feel they are necessary In the letter which will be going home to parents, they will be reminded that several changes of clothes will be necessary for their child. At the beginning of the activity the practitioners will provide the children with waterproof clothing. Parents will be asked to pack wellington boots for their children in advance for appropriate footwear, however there will be some available for those who are unable to provide them.
Contact with soil	In this activity children will be exposed to what we call 'healthy bacteria'. Allowing children to be exposed to these types of bacteria will build healthy, functioning immune systems. Playing in mud is a normal thing for children so this will allow children to have these amazing sensory experiences	In This activity there is the potential risk of a child ingesting the soil	2	To prevent children from ingesting any soil there will be hand washing stations set up by the classroom door. This will allow the children to wash their hands in between stations and prior to entering the classroom. Prior to children using the mud pit children will receive a safety talk on how dangerous ingesting soil can be. While children play at this station a practitioner will be present to remind children about hygiene and enforce the washing hands rule.
Looking for	During this activity	In this activity	4	Prior to the activity soil will

likelihood	x	severity	risk level and acceptability		
			Low - L	medium - m	high - H
1-5	x	1-5	1-5 acceptable risk level	5-12	12+

				acceptable with precautions	unacceptable risk level - find ways to reduce risk.
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Above is a risk assessment, this assesses any risks or incidents which may occur during the activity. Overall, the risk of this activity is low to medium. After reviewing carefully, it has been concluded that the activity will be extremely beneficial to children and their science and mathematical development. Ensuring that there is supervision from practitioners at all times and placing the correct controls and measures in place this activity can be conducted without severe risk and without children getting harmed.

The role of the adult is essential to a child fulfilling their maximum development through outdoor learning. Adults can provide opportunities for children in many ways, for example, providing free outdoor play with mud and water to show how different materials can contain different properties. Adults can provide children with the opportunity to repeat what they have done, an example of this could be a demonstration of mixing mud and water to create a runny mud. Children can then go on and try this for themselves to see if they can recreate what the adult has done. Jean Piaget used the words 'little scientist' to describe children, believing that children learnt best by exploring their natural environments to gain understanding of the world around them. Piaget's theory of cognitive development is a theory of the nature and development of intelligence (Cherry. K, 2020). Piaget broke his theory down into four cognitive developmental stages. Stage one of Piaget's theory was named the Sensorimotor stage. This stage was based on children between the ages of 0-2. Piaget believed that at this stage babies developed through using their senses, such as, touching, observing, hearing and grasping at objects. At this stage babies begin to understand that objects exist. During this stage children will begin to use their senses to communicate with others around them. Their communication level is basic so hand gestures and nods or shaking of the head will be used. At this stage children begin to understand what cause and effect is, although they may not be able to put this to full advantage at this age, they will carry this onto play at later stages of life. Piaget believed in object permanence; this is a child's understanding that an object exists even though they may not be able to fully comprehend what the object is. Games like peek-a-boo will help children to understand a sense of self and objects. At the end of the sensorimotor stage games like this will quickly become uninteresting to a child (Ansari. M, 2020). The second stage of Piaget's theory was named the pre-operational stage. This stage was based on children between the ages of 2-7. At this stage children begin to think symbolically about things. At this stage children do not understand logic and are unable to mentally manipulate information. During this stage children begin to play and pretend. They may pretend that a box is a castle. At this stage children play ignoring the use of the object's actual functions. Piaget believed that at this stage children partake in

symbolic play. Symbolic play is when children begin to create imaginary friends or scenarios by themselves or even role play with friends, this shows a child's creativity skills and how good their ability to communicate with others can be. Later at this stage children become inquisitive and ask various ranges of questions. Piaget called this the intuitive substage, at this stage children begin to acknowledge that they have a wide variety of knowledge but cannot understand where it has come from (Ansari. M, 2020). The third stage of Piaget's theory was called the concrete operational stage. This stage was based on children between the ages of 7-11. At this stage a child's cognitive development has a turn. At this stage a child's logical and operational thoughts begin. At this stage a child's thinking becomes more 'mature' and like an adult. At this stage children will begin to understand that objects contain the same product even if it appears in a smaller or larger way, for example, mud in a tub. If a practitioner gathers two tubs of mud the child can easily acknowledge that the tubs contain the same amount of mud and when one of the tubs is transferred into a big mixing bowl the children will understand that they still contain the same amount. This example shows adults educating children through 'mucky' play. The same happens when having two same sized glasses of water. The children will acknowledge that they are the same volume of water. When one glass is transferred into a beaker children will be able to understand that although it physically looks different there is the same amount of water in each glass. This type of experiment can be demonstrated by an adult and then children can practise by themselves with other materials (Cherry. K, 2020). The final stage of Piaget's theory is known as the formal operational stage. Piaget believed that this was the final stage of cognitive development. This was based on children aged 12-adulthood. At this stage children begin to use problem solving and begin to clearly understand how to work things out. At this stage children understand the environment they are in and can analyse risks and make decisions for themselves. At this stage children can create their own scenarios and hypothesise the outcome based on their knowledge (Cherry. K, 2020).

The foundation phase framework (Welsh Assembly Government, 2008) states that it is the role of the practitioner to ensure all children receive an active, experimental style of learning through cautious planning, organising and observing to provide the children with the best opportunities to develop their creativity. It is important that the practitioner creates a stimulating activity using different materials such as sands, water, rocks, pebbles, mud, sticks, mirrors and paintings to engage children when learning about science and maths. A practitioner who uses enthusiasm will allow children to actively feel more involved with the subjects they are learning about. A practitioner should allow children to explore freely, use materials from inside and outside of the classroom where it will enhance their learning. When practitioners encourage children's creativity during outdoor learning the child's curiosity is stimulated and it raises their confidence and children will begin to experiment new things, for example, when a child gets praise for jumping in a puddle the practitioner may encourage them to jump into a bigger puddle, this teaches children that more water creates bigger splashes. This will encourage children to find out why this happens, linking to their science development. This also encourages children to take risk (The foundation phase framework, 2008). Piaget's theory supports the idea that child-led play hugely increases a child's development in science and maths. Observing children is essential for practitioners, this allows the practitioner to truly understand the child, how they play, and most importantly, how they learn. Through observing children, the practitioner will be able to see what the

children like and dislike, using this information the practitioner can set up unstructured scenarios outdoors for children to play in which will develop their mathematical and science skills. Through observing children during play the practitioner will be able to specifically tailor activities to the children which will allow the child to engage in activities. Taking observations is also important for the practitioner to share with the parents as this way children's science and maths development does not only have to develop on the playground but also at home in their back garden (Whalley. C, no date). The role of the adult is to allow children to play freely. If an adult is invited to play it is important that they do not take over. If this happens the adult must remove themselves from the situation instantly. It is important that the practitioner makes play a priority as children learn best through play (Seriously kids, 2019). Without realising it, maths is seen everywhere. With supporting adults, children can grasp mathematical concepts using play. Some ways in which children can learn maths through play is allowing children to hand out books in a classroom or hand out worksheets outdoors. Allowing the child to count the books, for example, one book, two books etc helps to develop a child's counting skills. Taking children outdoors and allowing them to count the number of trees they can see is another way to develop their mathematical skills. Children can also number the trees in chalk biggest to smallest. Planting seeds with children can help their number skills develop as they can count how many seeds were planted and create a tally chart to mark off each day it grows. When the plants grow children can measure the plants and score them from biggest to smallest. This develops their mathematical skills (Early years, 2018). It is important that children have understanding in basic number skills such as their number bonds to 10 and 20 to be able to exceed in mathematical development. Adults can help improve these skills by setting up activities such as counting blocks, toys or sweets. (Welsh Assembly Government, 2008). Planting seeds with children can help them to understand the life cycle of plants which develops their science skills, it also teaches them the basics of photosynthesis when they learn plants need water and sunlight (Early years 2018). Playing with water can teach children that without realising it science is all around them. Using water can teach children about comparing different volumes of water and the different motions of it. A big bowl of water could make big waves when we blow on it whereas a little bowl of water could make small waves. This will allow children to ask the question 'why does this happen?'. Children can also run around and find things to put in the water to see if it will sink or float, this could lead to children asking, 'how does a big rock sink quicker than a medium sized rock?'. It is important for children to ask the questions of 'how' and 'why' as it will aid with their science development. Another way children can develop their science skills is by filling a water bottle up writing their names on it and placing their bottle of water outside in the winter months this experiment will show children what happens when water gets cold. Children will understand clearly then that when water gets cold it freezes. Children can then watch what happens if they put the bottle next to a radiator and later the teacher will be able to demonstrate what happens when the water gets boiled. This teaches children about water and its states of solid, liquid and gas (Kidsclub, no date). Being outdoors children will also be able to observe animals in their natural habitats. Children could list the animals they see while outdoors and place them into groups of the food chain. Science correlates massively with nature and allowing children to explore nature and the outdoors will develop their science skills greatly (Hoffman. J, 2013). It is important that the practitioner encourages children to note down and record anything they might find interesting during these times of

play. Allowing children to express what they have found in the form of diagrams, photographs, tables, bullet points or tally charts is a way of recording results which is a very important scientific skill. Recording findings is something that children will use in science experiments so encouraging it in early years gives them the skills they need to excel in later education.

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