

<u>Contents</u>	<u>Page number</u>
Activity plan	2 - 4
Evaluation	5 - 8
Discussion	9 - 11
Explanation	12 - 13
References	14 - 17

Cynllun Gweithgaredd Activity Plan		
Activity: A nature walk to collect natural resources to use in the mud kitchen, allowing children to use their imagination to bake/cook.		
Number of children: 3	Age of children: 3 and 4 -year-olds	Number of adults: 2
Location: Nature walk at the local park, using the mud kitchen in the back garden.	Preparation time: 1 hour:	Activity time: 1.5 hour
Resources: • Natural resources, sticks, stones, and grass. • High-vis jackets • Mud kitchen, some child size saucepans, frying pans and cooking apparatuses.		
Aim/s of activity: The main aim of the activity is to develop and promote children's mathematical skills, exploration, and problem-solving skills. An aim of the activity is to give the children multiple opportunities to develop their mathematical skills.		
Links to outcomes: The Foundation Phase framework (2015) outlines numerous different outcomes which are linked with this activity, • One outcome is that they will be able to recognise 'more' and 'less' in their play. Weighing out their resources and transporting the items from one bowl to another. • Also, the children will be able to sort and classify objects, based on their qualities. For example, the children may place all the sticks together, or group them in size order.		

- This activity may promote the individuals measuring skills, and they may use words that describe temperature, for example, the children may recognise that the weather is cold.
- The children will understand the concept of time, in terms of daily events and they will demonstrate a sense of how long things take. When 'cooking' in the mud kitchen, the children may decide on how long an item will take.
- Comparisons can also be made during the activity, based on length, height, and distance.
- The children may recognise simple addition and subtraction in the activity, as they will begin to comprehend 'one more' and 'one less'.

Differentiation:

To ensure everyone has the same opportunities to partake in this activity, and to ensure the activity works in line with settings equality policy. Careful planning will ensure children who require 1 to 1 help, or adapted resources are considered and catered to.

Health and safety:

A risk assessment will be completed in line with the settings policies, considering any hazards / risks of this activity. Practitioners must be aware of any potential hazards which may occur throughout the activity, these should be minimised to ensure the children are safe.

Role of adult/adults:

The adults should work alongside the children and ensure they do not begin to take control of the activity. During the activity, the adults should scaffold the children's learning, in line with Vygotskian thinking. Practitioners should help facilitate and extend a child's play, they will additionally have to ensure the children are being supported when required.

The activity:

To begin, the children will prepare themselves for the nature walk, they will gather their weather appropriate clothing and shoes, which will give an opportunity to promote their mathematical skills, as they will develop and understanding of quantity. The children will then partake on a nature walk around the local park, they will collect natural resources, such as, sticks, stones, acorns, and grass. There will be opportunity to count on the walk, as the children involved may count 'three sticks', for example,

enabling the child to develop and understanding of counting and amounts whilst visually seeing the amount. During the walk, the children may discover loose parts, which are different shapes and sizes. After the walk, the children will return to the setting garden. The children will be encouraged to create their different ideas in the kitchen. The children will be able to use these resources to make foods. They will be able to develop their mathematical skills as they will be given the opportunity to weigh out these resources, as well as investigate and explore whether they will need more or less of an item. Similarly, to the nature walk, the children may also be counting their resources whilst using their mud kitchen, for example, they may recognise that they would need two handfuls of grass to create their mud pie.

Pacey (2017) state that planning helps provide a quality play experience for the children, whilst presenting them with multiple opportunities to develop and improve their skills, through careful planning a play-based activity will allow children to develop their mathematical knowledge and work towards their next steps.

The planned activity aims to improve children's mathematical skills, allowing them to develop an understanding of mathematical concepts. The plan promotes a child-led approach, as the children will be responsible for collecting their own natural resources, and they will be encouraged to use them independently within mud kitchen. The plan offers children the opportunity to be creative and innovative within the outside environment, Knight (2011) supports this, as he suggests that this supports mathematical thinking. Further, Froebel (1837) states that children learn to the best of their ability when they are ready and feel in control. This highlights a strength of the planning, as it supports child-led learning and play, which therefore empowers children to be confident and in control. Chigeza and Sorin (2016) emphasize the importance of a child-led activity, whilst demonstrating how much a child learns from it, this, therefore, supports the view that the children will learn mathematical concepts, such as counting, ordering and estimation throughout this activity. Piaget (1958) reinforces this idea, as he agrees that children are active learners, this highlights the strengths of the planned activity, as it is child-led, suggesting that the children will feel confident and will learn about mathematical concepts, as they are in the centre of their own learning.

A further strength of the planning is that it offers children the opportunity to learn in an engaging way, making it unintentional, as the activity is based on an 'everyday task', which is cooking. Hollis Montessori school (2018) recognise that a Montessori based curriculum is about giving the individual freedom to explore, which emphasizes this strength and implies that mathematics is a topic which should be taught in a fun, interactive way. Pratt (2011 cited in Tucker, 2014, p.22) supports this strength of the plan, as he believes that children should develop a 'mathematical disposition', which can be strengthened by doing maths outdoors, as it

shows them that maths is all around, suggesting they will begin to independently recognise connections within their learning.

Capital Montessori School (2016) acknowledges that children learn and develop an understanding of different concepts through exploring using their senses. The plan offers a sensory experience, as the children will be exploring different textures, for example, of the natural materials. Therefore, this validates that a strength of the activity is that it is hands on and offers a sensory experience, which will help the children understand the mathematical concepts further, as they will be in control when participating in the planned activity, such as, weighing out the resources. Bruner (1966) supports the Montessori ideology as he considers learning as an active process, suggesting the individual should be interacting, and learning through first-hand experience. The evidence agrees that the plan is effective, as children learn best when they are involved, whilst being given the opportunity to make mistakes and correct them. Gallagher (1981) discusses the importance of children being able to recorrect their own mistakes, based on Piaget trial-and-error process, the plan offers children the opportunity to change anything which they do not feel has been done to the best standard, suggesting that this is a positive of the planned activity.

To improve the plan further, the resources could be enhanced, as although the plan is for the children to collect natural resources, 'pre-made' materials will also be on offer, such as toy knives. This part of the plan could be reconsidered as, the children could safely use working knives, as they are competent individuals who should be trusted with an element of risk. Play Wales (2018) agree that children require an element of risk, as it is a natural part of life, which therefore supports the child in developing an understanding of boundaries and the world. Montessori believe that professional practitioners should offer children practical resources, which help prepare them for the future, rather than toy knives, as it supports children in become ambitious, capable learners, which is an outcome for the New Curriculum in Wales, outlined by the Welsh Government (2015). Consequently, some of the resources used may be identified as a drawback of the activity, and they could be improved.

Throughout the plan, the role of the adult was carefully considered, the West Sussex Government (2020) recognised that adults should value children's practical explorations, as this will enable them to be confident, independent mathematicians. They state that a professional practitioner should use mathematical language and concepts, throughout play and during daily activities, this was outlined in the activity plan. For example, the plan states that the children will independently collect their own natural resources and will begin to make comparisons of these materials. Pacey (no date) agree that adults should facilitate play rather than control it, as Vygotsky also recommends, this highlights the importance of this aspect of the plan, as it states that the adults observe the children at play.

Health and safety were considered throughout the plan, the National Minimum Standards (2016) were respected, as it is a national requirement to ensure professional practitioners work in line with the ratios stated. In the plan, three children were considered for the activity, with two adults, as although only one member of staff is necessary based on the National Minimum Standards (2016), as the activity involves a walk it will ensure all children are safe throughout. A risk assessment would also be carried out, as it is important that the planned activity is as safe as possible, whilst giving children some freedom to explore, as Ouvry (no date) recognises that some risks are beneficial as they help make children feel confident in their own decisions.

The environment was also considered within the plan, as Wisbey (no date) recognised that Montessori (1946) believes that children are born with a natural curiosity about the outside world, suggesting that completing an activity outside will be more appealing to the child, indicating that the children will be more engaged throughout their learning, and will therefore be exploring and broadening their knowledge on mathematical concepts. Montessori group (no date) acknowledge that being outdoors is important for children and believed that children should be able to touch and be engaged with the substances of the world, encouraging children to work with natural resources. White (2014) supports this view as she states that an outdoor environment is valuable, as it offers children materials and opportunities which are

best suited to them, suggesting that a positive of the plan is that it is outdoors, as it will make the experience more enjoyable for the children, meaning they will be engaged with their mathematical learning.

Professional practitioners are responsible for choosing enticing and beneficial resources for an activity. Faculty of Public Health (no date) state that children who have resource deprivation, fall behind their peers at school, and then have further employment difficulties in adult life. This statement emphasizes how resources help facilitate and support a child's learning and should therefore be available and appealing to the children throughout the planned activity and within a setting.

Both natural, loose parts and 'plastic' toys will be used throughout the planned activity, as Lopez (no date) recognised that the environment and resources in a classroom are important, as they have the power to impact the children's view on learning, both positively and negatively. Moreover, mathematical resources should be readily available to children to provide opportunities to engage in mathematical play, such as, a construction area and shapes to feel. It is important that settings carefully chose the appropriate resources based on what they hope to achieve, which in this case is mathematical development.

Furthermore, settings have different approaches when it comes to resources, for example, some may prefer wooden and natural materials, whereas others may use plastic resources, however, plastic resources may limit opportunities and creativity since they have a fixed purpose. Natural resources Wales (2021) describe how natural materials support mathematical thinking, through a practical based approach, as mathematics is all around, therefore children are able to mathematical skills whilst using natural resources. Montessori Group (no date) suggest that all resources and materials within a high standard setting should be 'child-sized', as this makes the resources accessible to each individual. Montessori created materials based on the child's interests and what was appealing to them, she also removed items that children showed no interest in, highlighting the importance of responsive and knowledgeable adults. Play Scotland (no date) support Montessori view, and highlight the importance of loose parts, suggesting that they can be used freely by the child as there is no 'set way' to use the materials. This highlights why the children will be collecting natural resources within the planned activity, as they promote and encourage creativity, for example,

the individual will be able to decide what stick size would work best as for them, this therefore promotes their mathematical development. Further Tucker (2014) suggests that this encourages mathematical development such as exploration, creativity and risk taking, as the children will be able to use the environment to discuss ideas together and continually make use of mathematical thinking through their play. Welsh Government (2017) outlined that an aim of the New Curriculum is to support children to be enterprising, creative contributors, preparing them for work, indicating that the planned activity will help promote this, as they will be using loose parts, which engage children and promote creativity. Strengthening this view, Tucker (2014) suggests that, loose parts help children extend their own learning, as they will be involved and engaged in independent problem-solving, whilst being creative, such as measuring and comparing stick lengths or creating food, as the children will be weighing, counting, and comparing the natural materials.

Moreover, Knight (2011) suggests that when children are given freedom, they will become more creative which will therefore promote creative mathematical thinking. This emphasizes why natural resources are important throughout the planned activity, as they give children the opportunity to explore their natural mathematical curiosity, as they are able to decide how they would like to count the loose parts, opposed to being given a number line, for example. Through loose parts and natural materials, the child will be able to take control, and explore based on their interest, for example, during the planned activity a child may collect stones and they may weigh and measure this resource to achieve their final product. These resources may be seen as more valuable than 'plastic' toys as they have a limited use, Knight (2011) suggests the children will be able to explore and follow their natural mathematical curiosity through loose parts.

Kumar (2014) revealed through his research that children preferred real resources in an outdoor environment. This emphasises the value of natural resources and nature, as all participants, stated that their ideal play scenario is outdoors. This suggests that children will

learn best when using natural resources, as they favour them and would therefore enjoy using them, whilst learning unintentionally.

National Numeracy (2012) recognise that negative attitudes are the cause of the numeracy crisis, they recognise that bad experiences of maths are the root of this issue. This highlights the importance of ensuring children have access to diverse, appealing resources within the planned activity, as their early childhood memories of maths will influence their opinion through later life. Further, as suggested by Knight (2011) a well-planned environment with space allows children to be innovative and therefore supports a positive disposition. This highlights the importance of choosing appropriate resources, which allow children to use their imagination within this mathematical planned activity.

Professional practitioners and adults should work alongside the children to support and facilitate their mathematical learning, as the Foundation Phase (2015) state that all children should have the opportunity to experience a mathematically rich environment, whilst being given freedom to explore mathematical concepts. Rymanowicz (2015) stated that adults should extend and support children's play, by engaging with them when they recognise play cues, which show an adult that a child is prepared for them to get involved. Play Wales (2013) agree that children need opportunities to work alone and alongside other children. They state that adults should only get involved in children's play in certain situations, for example if children ask for their support or if they display play cues, by allowing children to play independently it offers them freedom, whilst enabling them to follow their natural mathematical curiosity.

The Foundation Phase Framework (2015), states that there must be a balance between structured learning and child-initiated play-based activities. Settings can promote learning and mathematical development by providing a high-quality, engaging environment which allows the children to explore mathematical concepts and language. Stevens (no date) agrees that settings should ensure that they offer the opportunity to develop their mathematical skills through active learning. A professional practitioner should plan engaging activities for the children, whilst acknowledging that each child is unique, which is supported by Vygotsky (1978). Settings may plan to include mathematics into daily activities, such as circle time. For example, nursery rhymes which involve counting, such as 'five little ducks', this type of activity promotes the children's mathematical development, whilst allowing them to learn unintentionally. Settings should provide continuous mathematical provision as explained by Tucker (2014) through the use of real-life experiences and by reviewing the provision, for example through, routine of the day and time.

Practitioners are responsible to monitor and assess in line with the Foundation Phase framework (2015) and the Numeracy framework (2013), however, to be able to achieve this, practitioners need to be able to provide stimulating opportunities for children to engage and

demonstrate their knowledge. Therefore, they need to be confident and enthusiastic throughout the learning process. Donaldson (2015) worked alongside the Welsh Government to evaluate the curriculum in schools in Wales and produced the Successful Futures report. This report replaced key stages with 'progression steps', as he believed that learning should be seen as a continuous experience and progression steps should be developed in a way which provides a space for those who may develop earlier, whilst offering support for those who may require additional support. Vygotsky (1978) theory supports these changes, as he recognised that each child is unique and settings should therefore plan for each individual, based on their skills and knowledge.

Children's progress should be monitored as it helps practitioners understand the child, and how they can scaffold their learning to further their development. Neaum (2016) states that practitioners should observe and assess children as it allows them to discover what each individual is interested in and based on this information the practitioner will be able to create an activity based on their interests to further their learning. Froebel (1837) supports this, as he states that children learn to their best of their ability when they are engaged and interested in the topic, this demonstrates why it is important to assess and monitor children. Moreover, assessing children will allow the practitioner to understand what the child may be capable of, and from this they will then be able to promote their mathematical learning further, helping them achieve their progression steps.

Moreover, the National Literacy and Numeracy Framework (2013) outlines four strands of numeracy to help practitioners develop an understanding of the expected progress for each skill. The strands summarised are developing numerical reasoning, using number skills, using measuring skills and using data skills. Also, the framework states maths should be a strand that runs through all aspects of learning and should not be seen as an isolated aspect of a child's learning. Hollis Montessori School (2018) agree with this idea, as Montessori recognised that mathematics is all around us, and should therefore be cooperated into every activity, as this will help them become more familiar with the concepts.

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