Contents

	Pg No
Activity plan	2-6
Evaluation	7-9
Discussion	10-11
Explanation	12-13
Reference List	14-17

Activity Plan

Activity Plan		
Activity: Mud Kitchen to support children's mathematical development through play		
Number of children: 6	***Age of children:*** 5 years old	***Number of adults:*** 2
Location: Outdoors in the mud kitchen area on the playground	***Preparation time:*** 15 minuets	***Activity time:*** 1 hour
Resources: - Sand - Water - Chalk - Stones - Weighing scales - Leaves funnel - Timer - Recipe cards - Coats - Wellies - Plastic boxes in a variety of sizes - Sticks - Measuring jug - Watering can - Utensils (spoons, pots, pans, ladles) - Bug hotel		
Aim/s of activity: Promote mathematical and scientific development such as counting and weighing, improving on communication skills and problem solving, enhance the children's imaginations and curiosity while also supporting the children's outdoor learning and exploration.		

Links to outcomes:

The above activity links in with the Foundation Phase Mathematical development outcomes –

Measures and Unit's

Outcome 3 – Using direct comparisons and simple measuring terminology such as heigh, distance weight and mass. (Welsh Assembly Government 2017).

Outcome 4 – using nonstandard units when measuring such as using sticks or straws to measure. (Welsh Assembly Government 2017).

Outcome 5 – Showing an understanding of the different types of measurements using scales and able to accurately measure objects. (Welsh Assembly Government 2017). Pg 68

Counting

Outcome 4 – Counting up to 20 objects.

Pattern

Outcome 3 – Recognize and repeat pattern sequencing using colour object and sounds.

This activity is also in line and supports the four purposes of the curriculum for Wales. The children will become healthy, confident individuals as they will be making decisions on leading the play. The activity is outdoors to provide opportunities for the children to move freely in the fresh air and become ethical, informed citizens. The children will be given the opportunity to create ideas, solve problems and think creatively leading them to be enterprising, creative contributors. Allowing the children to communicate with one another effectively while learning how to use numbers in the correct context enable children to become ambitious, capable learners (Welsh Government 2015).

Differentiation:

Some children may be more advanced than others and display difficulty reading the measurements accordingly, if this occurs allow the children to measure using a measuring line along with numbers on the sticks, simply by using chalk create a line with a number on a variety of length sticks, allow the child to pour the water to the number line. When weighing the mud and the sand instead of using the scales to read measurements ask the child to scoop using a spade the appropriate amount of mud or sand into their mudpies while counting each scoop. There will be 2 sets of recipe cards, one set with the correct measurements on for the more able children and another set with numbers on for the children who cannot quite read measurements yet, the number on the cards will indicate the correct number of scoops needs or the correct level of water specified with a number.

Health and safety:

All practitioners must ensure adequate health and safety procedures are put in place before the activity is carried out this will include ensuring that the risk assessment is up to date and a check list safety check must be carried out before the activity takes place. Ensure that all resources are within reach of the children to minimize any risk of over stretching or climbing incidents. Once the activity has come to an end ensure that all resources and equipment are stored and carried in a safe manner. All staff must hold an up-to date first aid qualification in the event of an accident. Practitioners must explain to the children what the activity entails while also being specific about safety rules before the children engage in the activity.

Role of adult/adults:

The practitioners in charge of the activity must ensure the area around the activity is safe for the children to explore while observing and assessing the children's behavior. Ensure the children's needs are met accordingly and develop a stimulating environment with enriched areas of learning. Encourage sustained shared thinking with the children, explain the activity thoroughly, use specific vocabulary which enables the children to ask questions. It is important to listen to the children and recognize any cues that lead to the child/ren needing help or engagement from an adult.

The activity:

The mud kitchen will be set up outdoors in a spacious area allowing the children to have more room to explore. If the weather is wet allow the children to wear their weather appropriate clothing.

- Firstly, ask the children to sit down in a circle.
- The practitioner must then model and explain the task to the children.
- Ask the children to put on the apron provided.
- Ask the children to collect natural resources using the boxes and buckets provided such as sticks, leaves, flowers and stones using the space around them.
- Once the children have collected the resources ask the children to count how many sticks, stones or leaves they managed to collect.

- Using the mud, sand and water alongside the simple instructed recipe cards the children will be required to make mud pies, they will have to weigh the mud and the sand using the weighing scales then using a measuring jug to measure out the water, allowing the children the opportunity to read the measurements themselves.
- Once the above steps are complete the children must then put their mud pies in the oven within the mud kitchen and set their timers to 5-10 minutes.
- While the mud pies are ‘cooking’ allow the children to decide if they what they want to do, they are welcome to take a look at what bugs are in the bug hotel, if there are any ladybirds count their spots or the legs of each insect you find, ask the children open ended questions while allowing them time to answer such as ‘can you see a spider or a beetle, how many legs does it have, what color is it?
- Once the timer sounds out, the children may have the option to carefully remove the mud pie from the oven and decorate the top with some the sticks, stones and leaves which they collected earlier or continue to investigate the bug hotel.

Evaluation

The benefits of allowing the time and space for children to engage playing with a mud kitchen are endless, not only does it promote outdoor learning with natural resources, but it enhances the children's learning through play and promotes children's social and mathematical skills (Early Years Careers, 2016). Further Pratt (2011) explains how the outside environment supports children to develop mathematical concepts and that through play children make connections. Providing the children with open ended loose part resources has many benefits to a child's mathematic development, children will learn the concepts such as shape, size, sequencing, and sorting (Pacey, 2019). This is also supported by Tucker (2016) who argues that the best resources to use for mathematical learning are natural loose parts offered to the children in baskets or boxes. Tucker (2016) suggests that loose parts can provide meaningful links for a range of different areas of learning such as science, mathematics, and language. Loose parts range from all different material resources such as household items, sticks and fabric among many more, these resources should always be accessible to every child as discussed by Wilder (no date) loose parts provide children with opportunity to create patterns through collected treasures or collect items in artwork. Wilder (no date) continues to say that loose parts can be pinecones, leaves, sticks and stones, all of which supports the idea's suggested in the above plan. Play Wales (2021) recognizes the importance of outdoor play within Early Years and indicates that playing is central to child's physical, mental, social, and emotional health and wellbeing regardless of a child's impairments or behavior. This also coincides with the UNCRC, adults must allow adequate time and space for children to play, every child has the right to play (UNCRC no date). A mud kitchen is a perfect way for allowing children the use of communication, to talk about the size, weight and smell or texture of resources while also allowing the space and use of everyday objects and mathematical concepts such counting, weighing, measuring, recognizing different shapes and same or different (University of Cambridge, 2021). It is said by the Welsh Government (2019) that it is vital within Early Years that mathematics and numeracy experiences are as

engaging and exciting as possible to develop mathematical resilience, developing resilience is a contributing factor to the ambitious and capable learners which supports the Four Purposes Curriculum for Wales (Donaldson, 2015). The use of the natural materials within these types of activities will enhance the children's learning and senses, allowing a child to use materials such as sticks will allow the children a better understanding of the outside world while developing risk taking skills and their imaginations (Early Years Careers 2021). This is also supported by Tucker (2016) who suggests that using natural materials and resources such as sticks, stones and shells while engaging in mathematical activities provides potential for the children to become creative. Furthermore Knight (2011) discusses how children's creativity may be supported, the planned activity supports this through allowing the children to connect themselves with nature, curiosity, and endless role play opportunities. Tucker (2016) continues to explain how holistic development is supported and agreeing with the Foundation Phase (2017) guidance that allows the children outdoor opportunities provides the children with more freedom to be creative, and that the outdoor environment will stimulate creative mathematical thinking. The plan provides guidance for effective health and safety, it does this through following The Early Years Foundation Phase (2017) guidance, clear instructions are provided within the plan. The adults involved within the activity must observe and assess the children's behavior as detailed in the above plan, this can be recorded via a digital camera as evidence (Children First, 2015). Observations within the Foundation Phase is considered a vital key role in everyday practice (Montessori 2020). The plan provides details on how the activity was inclusive for all children, this is in line with The Equality Act 2010 and the UNCRC article 24 and 28 (Mencap no date). The above plan supports the inclusion and offers a differentiation to support children with Addition Learning Needs to engage children and prepare for life as a global citizen (Foundation Phase 2015). Montessori (2017) theory recognizes the importance of a child's holistic development through play, the theory emphasizes a child's independence and freedom within limitations, the idea behind holistic approach is for a child to learn whilst playing in a variety of different environments which engages the brain within natural environments. Montessori (2017) also stated how important it was that children got to use everyday materials within their play-based learning activities as this will encourage the children to make connections and provide deeper learning, the plan above supports this theory and involves natural everyday materials

that will encourage the child's development while also using mud, sand and water which are considered sensory materials will enhance the children's fine motor skills.

Discussion

Gibson, et al (2017) suggests that it is important for Early Years settings to provide children with high quality play activities to engage in, indoor and outdoor play opportunities should be offered to children at all times of day. National Resources Wales (2021) explains that allowing children with the space and practical play opportunities outdoors provides children with skills they may need in adult life, while also providing the opportunity to develop friendships along-side social identity and well-being. This is also supported by Pratt (2011) who argues that allowing children the opportunities to engage with the outdoor environment offer children a sense of freedom and encourage a mathematical disposition for children to become effective mathematicians. Natural Resources Wales (no date) argues that the outdoor environment provides meaningful opportunities to enhance children's learning and experiences across the curriculum and supports children to problem solve and think critically which leads to encouraging children to explore and overcome challenges to become more resilient citizens, this supporting Donaldson (2015) and his successful futures curriculum. It is said by Tucker (2016) that the best resources to use within mathematical activities are natural materials offered to children in baskets or boxes, this stimulates their curiosity and provides the potential for children to be creative while also providing links between other areas of learning such as science, language, geography, and history. Reggio (2020) supports that natural materials are the best to use within child development as they encourage children to interact and explore the world through material while also providing the opportunity to explore their senses in the process which will encourage mathematical development. For example, sight will encourage the child to see how tall or small things are such as tree's (Early math counts 2017). The theory of loose parts was developed by Simon Nicholson in 1971, loose parts are a collection of natural transferrable materials that allows endless opportunities while encouraging open-ended learning for children. Using loose parts is the perfect resource for mathematical activities as it allows children to be creative and empower their imaginations through play while being able to experiment and discover (Altitude Learning no date). Further Wilding (2021) recognizes the importance of loose parts and subitizing patterns for children's mathematical development as this offers children opportunity to see the difference

between materials while also focusing the children's attention on the properties rather than the appearance of the image. Sarama (2007) describes that by doing this contributes to children's algebraic thinking and provides an opportunity for children to observe and verbalize generalizations as well as focusing their attention on patterns and repeating shapes to promote repetition, balance, size, and space. Montessori (1946) explains how experiences within the outdoor environment is vital to effective environmental education while providing experiences to support the mathematical mind and enabling children to be closer to nature by using the natural materials and wildlife. It is both intriguing and magical to provide a child with the opportunity to explore the wildlife such as lady birds, by doing this will allow the children to explore and discover while being creative learners. Montessori (2015) also explains how using natural materials will enhance the children's mathematical learning such as flowers, sticks, stones, and leaves. Allowing the children to gather the materials while counting them or sorting them into size order or using weighing scales to weigh out the sand and mud would be beneficial to the mathematical mind. Messy play in the outdoor environment should be encouraged within Early Years settings, adults should support messy play as a joyful experience. Most children will naturally enjoy engaging in messy play such as mud (Community Playthings 2021). Mud-play is a great way to incorporate mathematical learning into play alongside problem solving, an example of this would be to create a life like kitchen to inspire baking with the mud using kitchen utensils and natural collected materials will encourage creativity (Miller 2020). Many settings are now encouraging the use of natural resources within a modern pedagogy which is inspired by the Reggio Emilia Approach for children's development (Early Years Careers 2021). Tops Days Nurseries (2016) describes how natural resources are said to encourage and develop children's fine motor skills while allowing children to express their thoughts through creative thinking, while plastic resources may restrict children's thinking skills because plastic toys can only be used for their purpose. Natural materials have many benefits for children's mathematical development as they are inspiring which fascinates children and leads them to explore them, these types of resource can be used multiple times for all different activities, a few examples of this would be mud kitchen play, symmetry and measuring, using the children's imaginations they are able to create anything while exploring open ended natural materials such as sticks, stones, leaves, sand, water, and flowers (Early Years Careers 2015).

Explanation

Bandura (1925) Social Cognitive Theory is based on research that contributes to children's behavior, it is said that children mimic and are influenced by adults modelling behavior. Bandura (1925) claimed that children learn and develop at a quicker pace by observing adult's behavior. Further Vygotsky (1986) explains that children will develop their communication and language skills through observing and interacting with others. According to Vygotsky (1986) communication with others is the tool for cognitive development skills (Rose and Rogers, 2012, p.51). Communication is said to be an important aspect of mathematical education, by communicating with each other provides the opportunity to share idea's and clarify understanding while also helps to construct meaning and quality of ideas among each other (Sammons, 2018. p1-2). The curriculum provides guidance on how practitioners must allow purposeful and enjoyable opportunities for children to develop a confidence within the mathematical language to develop depth of knowledge, numerical and analytical skills where appropriate (Welsh Government 2017). It is vital within an early years setting that practitioners ensure that all children are meeting their personal development goals while achieving and receiving the highest standing of learning, practitioners will need to understand each child's individual needs by using observation methods which is in line with the Early Years Foundation Stage, this then supports the practitioner to recognize play opportunities to further support mathematical development (Early Years Careers 2015). The National Literacy and Numeracy Framework (LNF) has been designed to support practitioners and teaching staff within settings to embed literacy and numeracy across the curriculum while focusing on the learners to develop the skills and concepts they will need to complete realistic tasks (Welsh Government 2015). The practitioner should carry out regular observations to discover what skills and ability level each individual child is at whilst also collecting information for the children's progression, observations are considered the most important aspect of day-to-day professional practice (Children first 2015). The Foundation Phase has 7 areas of learning which provide children with opportunities to explore and understand how the world works, a fundamental aspect of the Welsh Government Early Years Developmental Assessment Framework (EYDAF) is the Foundation Phase Profile

which is designed to observe and assess children's development, through the use of observations the profile is said to support practitioners to provide an appropriate holistic curriculum for children ages 3-7years (Early Years Wales 2020). In early years it is crucial for practitioners to create exciting and accessible mathematical and numeracy experiences for children to ensure learners mathematical resilience, using real-life activities for children of all ages will allow the children to explore mathematical concepts as well as strengthening them (Welsh Government 2019). Introducing a problem-solving approach to all mathematical and numeracy experiences for children as supported by Pound (2008) who explains that children to practice, make mistakes and work together further strengthens links between mathematics and other areas of their learning. This approach supports the four purposes curriculum (Welsh Government 2019). While education is compulsory around the world, educational curriculum differs between countries as Ruby Veazey (2018) describes that in New Zealand the Te Whariki approach is a Maori term for ''woven mat'', the curriculum does not assess and observe children's learning and development based on targets for children, it encourages teachers and practitioners to understand what each child is able to achieve whilst supporting the individual child to reach their full potential. The curriculum within Te Whariki is based around a more traditional approach which prioritizes learning dispositions which allows teachers the responsibility for 'weaving' their own content into their program (Lee et al. 2013, p.134). The learning outcomes in Te Whariki is based on knowledge, skills and attitudes which combine as dispositions and working educational theorists (Ministry of Education 2017).

Reference List

Altitude Learning (no date) *Loose Parts.* Available at: The Theory of Loose Parts — WIDE School (thewideschool.com) (Accessed on 12/02/2021)

Children First (2015) *Effective Practice: Observation, Assessment and Planning.* Available at: Effective Practice: Observation, Assessment and Planning (westsussex.gov.uk) (Accessed on 30/01/2021)

Children first (2015) *Effective Practice: Observation, Assessment and Planning.* Available at: Effective Practice: Observation, Assessment and Planning (westsussex.gov.uk) (Accessed on 17/01/2021)

Collins (no date) *Health and safety practice in early years settings*. Available at: BTECNationalCPLDF.pdf (collins.co.uk) (Accessed on 30/01/2021)

Community Play Things (2021) *Maths in the great outdoors.* Available at: Community Playthings | Maths in the great outdoors (Accessed om 14/02/2021)

Community Play Things (2021) *Mud Masters.* Available at: Community Playthings | Mud Masters (Accessed on 14/02/2021)

Community Playthings (2021) *Mud, Marvellous Mud!* Available at: Mud, Marvelous Mud! (communityplaythings.com) (Accessed on 19/02/2021)

Daily Montessori (2020) *Montessori Theory*. Available at: *Maria Montessori Theory | Montessori Method of Teaching | Daily Montessori* (Accessed on 30/01/2021)

Department of education (2017) *Statutory framework for the early years foundation stage.* Available at: Statutory framework for the early years foundation stage (publishing.service.gov.uk) (Accessed on 17/02/2021)

Early Math Counts (2017) *The Five Senses of Math.* Available at: The Five Senses of Math – Early Math Counts (Accessed on 19/02/2021)

Early Years Careers (2015*) The Importance of a professional Early Years Practitioner*. Available at: The Importance of a professional Early Years Practitioner (earlyyearscareers.com) (Accessed on 17/02/2022)

Early Years Careers (2015) *Using natural materials in the environment.* Available at: Using natural materials in the environment (earlyyearscareers.com) (Accessed on 15/02/2021)

Early Years Careers (2016) *Are natural resources better than plastic toys.* Available at: Are natural resources better than plastic toys? (earlyyearscareers.com) (Accessed on 15/02/2021)

Early Years Careers (2016) *Creating a mud kitchen for your outdoor area.* Available at: Creating a mud kitchen for your outdoor area (earlyyearscareers.com) (Accessed on 29/01/2021)

Early Years Careers (2021) *Are natural resources better than plastic toys?.* Available at: Are natural resources better than plastic toys? (earlyyearscareers.com) (Accessed on 30/01/2021)

Early Years Careers (2021) *Using natural materials in the environment.* Available at: Using natural materials in the environment (earlyyearscareers.com) (Accessed on 21/02/2021)

Early Years Careers (2021) *Ways to promote mathematics in the outdoors environment.* Available at: Ways to promote mathematics in the outdoors environment (earlyyearscareers.com) (Accessed on 26/01/2021)

Early Years Wales (2020) *Foundation Phase.* Available at: Foundation Phase | Early Years Wales (Accessed on 23/02/2021)

EYFS (2017) *EYFS Risk Assessments 2016-2017.* Available at: download.asp (woodstock.oxon.sch.uk) (Accessed on 30/01/2021)

Gibson, J. Et Al. (2017) *'A Systematic Review of Research into the Impact of Loose Parts Play on Children's Cognitive, Social and Emotional Development', Springer,* 31/07/2017. Available at: A Systematic Review of Research into the Impact of Loose Parts Play on Children's Cognitive, Social and Emotional Development | SpringerLink (Accessed on 05/02/2021)

Karen Wilding Education LTD (2021) *Using 'Loose Parts' in EYFS Maths.* Available at: Using 'Loose Parts' in EYFS Maths | Karen Wilding Education (Accessed on 13/12/2021)

Lee, W. et al. (2013) *Understanding the Te Whariki Approach.* Exeter: Swales & Willis Ltd

Mencap (no date) *Your child's rights in education.* Available at: Advice and support - Your child's rights in education | Mencap (Accessed on 30/01/2021)
Ministry Of Education (2017) *Te Whariki.* Available at: Te-Whariki-Early-Childhood-Curriculum.pdf (tki.org.nz) (Accessed on 24/02/2021)

Montessori International (2015) *Mathematics.* Available at: Layout 1 (uwtsd.ac.uk) (Accessed on 14/02/2021)

National Improvement Hub (2020) *The Reggio Emilia Approach to Early Years Education.* Available at: The Reggio Emilia Approach to Early Years Education | Learning resources | National Improvement Hub (Accessed on 12/02/2021)

Natural Resources Wales (no date) *Outdoor learning can improve childhood academic attainment.* Available at: Are natural resources better than plastic toys? (earlyyearscareers.com) (Accessed on 16/02/2021)

Pacey (2019) *Getting to grips with loose parts play.* Available at: Getting to grips with loose parts play | PACEY (Accessed on 04/02/2021)

Play Wales (2021) *Outdoor play*. Available at: Play Wales | Chwarae Cymru (Accessed on 29/01/2021)

Reggio Children (2020) *Reggio Emilia Approach.* Available at: Reggio Emilia Approach | Reggio Children (Accessed on 16/02/2021)

Rose, J. and Rogers, S. (2012) *The role of the adult in early years settings*. England: Open University Press.

Sammons, L. (2018) *Teaching Students to Communicate Mathematically.* Virginia USA: acsd.org

The Welsh Assembly Government (2009) *Foundation Phase Outdoor Learning Handbook.* Available at: foundation-phase-outdoor-learning-handbook.pdf (gov.wales) (Accessed on 27/01/2021)

The Welsh Government (2017) *Foundation Phase Profile Handbook.* Available at: foundation-phase-profile-handbook-revised-september-2017.pdf (gov.wales) (Accessed on 27/01/2021)

ThoughtCo. (no date) *Social Cognitive Theory: How We Learn From the Behaviour of Others.* Available at: Social Cognitive Theory: Definition and Examples (thoughtco.com) (Accessed on 17/02/2021)

Tops Day Nurseries (2016) *'Are natural toys better than plastic?'* Tops Day Nurseries [blog]. 13th April. Available at: Are natural toys better than plastic? - Tops Day Nurseries (Accessed on 21/02/2021)

Tucker, K. (2016) *'Creating and Using a Mathematical Environment', Sage,* 10/11/16. Available at: EAEE4005TUC12.pdf (uwtsd.ac.uk) (Accessed 04/02/2021)

UNCRC (no date) *A summary of the UN Convention on the Rights of the Child.* Available at: UNCRC_summary-1_1.pdf (unicef.org.uk) (Accessed on 29/01/2021)

University of Cambridge (2021) *Mud Kitchen.* Available at: Mud Kitchen (maths.org) (Accessed on 02/02/2021)

University of Cambridge (2021) *Mud Kitchen.* Available at: MudKitchen (maths.org) (Accessed on 02/02/2021)

Veazey, R. (2018) '*What is New Zealand's Early Years Curriculum?', Family* [blog]. 24th October. Available at: Te Whāriki: What is New Zealand's Early Years Curriculum? | Famly (Accessed on 17/02/2021)

Welsh Government (2015) *Foundation Phase Framework*. Available at: foundation-phase-framework-revised-2015.pdf (gov.wales) (Accessed on 04/02/2021)

Welsh Government (2015) *Foundation Phase Framework.* Available at: foundation-phase-framework-revised-2015.pdf (gov.wales) (Accessed on 22/02/2021)

Welsh Government (2015) *Successful Futures.* Available at: successful-futures.pdf (gov.wales) (Accessed on 19/02/2021)

Welsh Government (2015) *The four purposes of the curriculum for Wales.* Available at: the-four-purposes-of-the-curriculum-for-wales (1).pdf (uwtsd.ac.uk) (Accessed on 02/02/2021)

Welsh Government (2017) *Mathematics and Numeracy AoLE:* Available at: mathematics-and-numeracy-aole-december-2017.pdf (gov.wales) (Accessed on 17/02/2021)

Welsh Government (2019) *Mathematics and Numeracy.* Available at: 35002 Curriculum for Wales: Mathematics and numeracy English (uwtsd.ac.uk) (Accessed on 02/02/2021)