

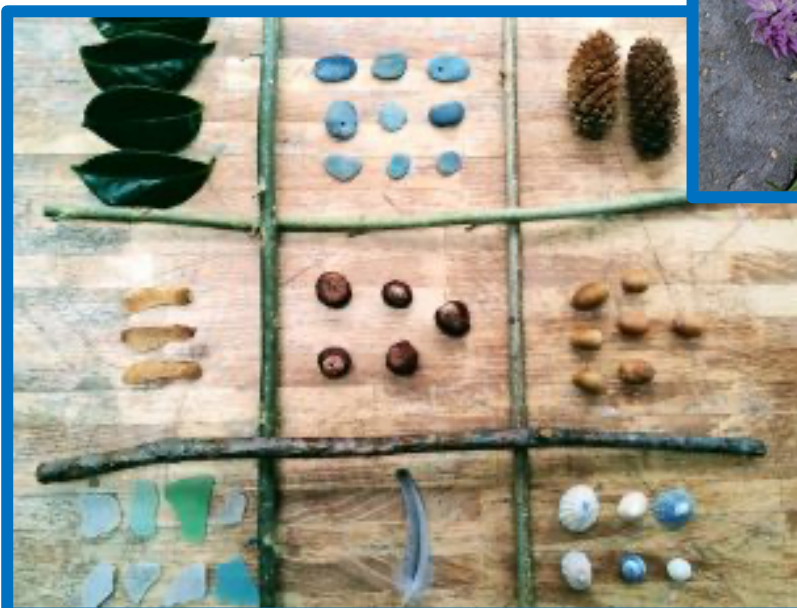
EAEE4005

The Young Mathematician



(Source: The School Run, 2021a)

(Source: Nurture Store, 2021)



(Source: LTL, 2021)

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Activity Plan

Activity:

Caterpillar Leaf Play

Number of children: 15

Age of children: 5

Number of adults: 3

Location: Woodland

Preparation time: 10mins

Activity time: 40mins

Resources:

Woodland area

A wide selection of leaves of different shapes, colors and sizes

A hole punch x 2 (MA/HA) / A3 paper x 5 / 4 glue sticks

Ball of wool, enough for 15 learners / Large plastic sewing needles x 10

Picture display of an example of what the learners hope to achieve

Numbers body cards for 3 groups / Suitable footwear for learners / Outdoor raincoats for 15 learners

Aim/s of activity:

The aim of the activity allows the learners to explore the concept of size and to get to grips with mathematical language about size. Using big, bigger, biggest, small, smaller, smallest etc., at the same time as they are exploring natural materials, develops early fine motor skills (essential for pre-writing).

Links to outcomes:

- Cognitive impacts - gaining knowledge and understanding, academic outcomes
- Affective impacts - related to attitudes, values and beliefs e.g., gaining a sense of wonder or respect for nature
- Interpersonal/social impacts - improving communication skills, improving leadership expertise
- Physical/behavioral impacts - improving physical fitness, improving fine and gross motor skills, personal behavior and social actions

Same and different: developing language to compare and contrast different caterpillars e.g., longer, shorter, thicker, thinner.

The Very Hungry Caterpillar by Eric Carle is a popular and familiar story.

It offers opportunities to make cross-curricular links and links to counting and number comparisons, as well as the order of the days of the week.

Differentiation:

Lower Ability – To collect as many different sizes as possible of leaves and create their own Hungry Caterpillar, using the caterpillar template and a glue stick.

Middle Ability – To collect as many different sizes as possible of leaves, big/small ones and put them in the correct box, labelled BIG and SMALL, then to create a textured caterpillar with three body parts, using the numbered body parts cards.

Higher Ability - To collect as many different sizes as possible of leaves, big/small ones and put them in the correct box, labelled BIG and SMALL, then to create a textured caterpillar with five body parts, using the numbered body parts cards.

Health and safety:

School Risk Assessment is to be in place. Hand sanitizer to be available before and during lesson. Practitioners to ensure the area is clear of any obstruction. Area is to be clear of any objects that may cause harm. Though it may be difficult in certain areas due to the natural growth of trees and stumps. To ensure learners wear suitable outdoor footwear to ensure they do not slip and to warrant they have a good grip. Learners to wear Foundation Phase raincoats as a precaution.

Role of adult/adults:

Three adults, 1 teacher and 2 teaching assistants. Both teaching assistants to work with learners, one with LA and 1 with MA/HA. The teacher to prepare area and set out objectives of the lesson to the learners. Teaching assistants to set out the display/numbered cards and assist learners with scissors with the cutting of the string for their caterpillar leaf play activity and threading the plastic needles.

The Activity:

1. Once a register is completed, show the learners the lesson objective and wait for questions and answers.
2. Lead learners out in the woodland in an orderly manner.
3. Learners to sit on the logs and listen to the teacher reading out the story of the Hungry Caterpillar. Questions and answers.
4. Ask learners to split up into their 3 groups and wait further instruction.
5. Learners to collect various natural objects and as many different leaves as they can and place them in the correct boxes labelled BIG and SMALL.
6. Using the hole punch make holes through the leaves, questioning the learners about sizes, color and length.
7. Encourage learners to choose a big leaf first. Thread the leaf onto the string.
8. Now ask learners to find a smaller leaf and thread that. Keep going until they have a string of decreasing sized leaves.
9. When finished you can hang from trees, a branch or a fence to display and to encourage further discussion. Try again starting with an even bigger or a very small leaf.

Evaluation

Under resources on the activity plan, a range of natural resources are listed which are based upon initial ideas for this activity. Natural Resources Wales (2021) suggests that encouraging learners' physical activity offers a variety of activities that engage learners regardless of their age, fitness level or gender. Outdoor learning supports academic accomplishment. Learners having the opportunity to have hands-on learning and by developing cognitive and passionate processes is important for learning. The woodland area chosen for this it an appropriate choice. The woodland holds nature and shows its true form. According to Welsh Assembly Government (2010), states that outdoor areas are used in a many different ways for educational purposes Skills developed are, both formal and informal. The benefits of both formal and informal learning opportunities that is provided by woodland areas are therefore multifunctional. Learners having knowledge and some formal understanding leading to educational benefits; support of cultural ethics; enhanced personal skills such as communication; physical benefits including increased fitness and better-quality motor skills and health and wellbeing benefits in improved mental and psychological wellbeing, according to Welsh Assembly Government (2010). OECD (2021) argues that the curriculum framework provides guided principles. Early Childhood Education and Care practitioners then apply the pedagogical approaches and practices of their choice. All curricula specify the learning areas, usually a mixture of educational areas of development.

Using various resources ~~that were~~ available from the classroom, allows for further support for the learners. The use of glue sticks, paper, crayons and string provides learners with the aid and finishing ground to achieve the learning objective. Early Education (2021), states that Froebel considered all learners regardless of their ability. He considered the learners health, physical development, emotional well-being, mental ability, social relationships, the environment and spiritual aspects of development as essential. Froebel having high skilled mathematical and scientific knowledge, introduced occupations, including sticks, clay, sand, stones and paper folding. He believed that these interventions were open-ended and can be used to support leaners with self-initiated play. This concept is also supported by Ranheim (no date, cited in Community Playthings, 2021, no page), who stated that 'In summer, it

shades the garden with green leaves. And in autumn, crunchy brown leaves and tiny cones blanket the ground'. Nicholson (1972, cited in Extension.psu.edu, 2021), who carefully studied landscapes and environments that form networks, he believed that all children are all imaginative and that "loose parts" in an environment will endow creativity. Play specialists and early youthful educators altered the theory of loose parts.

The purpose of the activity was to allow learners to explore the concept of size and to get to grips with mathematical language about size. Machin, et al. (2015) suggests that when planning a lesson, decisions are required about what will be taught and more specifically what the learner is able to do at the end of the lesson that they couldn't do at the beginning. Welsh Assembly Government (2015b, no page) supports this statement by indicating that all learners will be healthy, confident individuals who 'have the skills and knowledge to manage everyday life as independently as they can' and people who 'connect and apply their knowledge and skills to create ideas and products'. It was important that the lesson was carried out within the woodland. Learners developed a thorough understanding of different terms of big, bigger, biggest, small, smaller, smallest etc., at the same time as they were exploring natural materials, develops early fine motor skills (essential for pre-writing). Tandfonline (2017) supports Vygotsky's theory here, where they link his idea to have one classroom, groups of practice relating to teaching and learning, where order of recognising themes for mathematical progress within the classroom or setting were connected.

Welsh Assembly Government (2015a) states that learners develop their skills, knowledge and depth of understanding of mathematics through practical, oral and real-life play experiences. The learners apply mathematics in practical tasks, in real-life problems and within mathematics itself. This concept is supported by Early Years Wales, (2021) stating that learners develop their thinking across the national framework and curriculum through planning, developing and reflecting. This supports the learners to obtain a stronger understanding and assists them to explore and make sense of their natural environment and the wider world.

The impacts and outcomes in the activity plan are strong and focused on the academic minds of the young learners. It supports and builds trust and incorporates group work,

alongside with individual work. Learners do not always see school as a learning setting, they choose to expect what they think is happening. For some learners, schools can be a place of friendship, exploration. For some it is a place of safety, as some are vulnerable. The Woodland Trust (2021) states that the beauty of teaching outdoors is that learners do not see it as learning or a lesson, but they learn some of their most valued lessons there, due to natural instincts. Having a post-it note pad and pencil on hand would support in jotting down notes. This method was used while the activity was taking place. There are many different ways of observing learners and recording their efforts and abilities. This is supported by Welsh Assembly Government (2009). As a practitioner it is important to reflect and explore different avenues of learning to encourage a variety of activities, which include sensory and emotional scenarios.

According to Foundation Years (2009), Pedagogy is the understanding on how learners learn and develop. This is achieved by practices through which we can enhance that process. It's believed that values and beliefs about what we want for learners, and supported by knowledge, theory and interpersonal experience. This concept is also supported by Education Victoria Government (2011), It states that Pedagogy covers many things that practitioners consider and know, and all the communications they have with learners. This would include child development, working in partnership with parents and other members of the family. Though the links to outcomes worked well, going forward it would benefit the learners and teaching staff to consider more minimum core, underline the respect and British values, democracy of the learner's voice and feedback and also having Welsh dimension involved, i.e., bilingual headings/groups names and plenary words linked to the lesson.

According to Gravells (2010), they propose that keeping on top of and improving your skills in these minimum core areas will enable you to consider how best to teach your subject in ways that support the learners and you. Being in that frame of mind it is vital that you as the teacher are acknowledgeable that Literacy, language, numeracy and ICT are crucial for the achievement of your learners' qualification. However, Welsh Assembly Government (2013), suggests that the framework is available and to be used to support all teachers for all subjects to identify and provide opportunities for all learners to apply literacy and numeracy skills across the curriculum. Literacy should

be available in both English and Welsh. Both English and Welsh versions are similar, but with only a few distinctive elements in the Welsh literacy element, replicating the unique requirements of the Welsh language.

The differentiation in the activity plan would benefit the learners should there be further additional needs, which would be considered following the setting additional learning needs policy. Learners would also benefit from further guidance by going back and creating their own creature creations using the natural resources, instead of having a set instruction for the practitioner. Early Childhood Ireland (2015) supports the Reggio Emilia approach by planning and designing the outdoor sessions to support the inclusion and meeting the individual needs. Taking that into account, the environment is the third teacher. With resources available and correctly prepared, the environment invites the learners to participate in play.

The lower ability had fun, mainly knowing the instruction but taking it on themselves to collect and throw the leaves in the air before accepting and endorsing the instructions that were set for them. Petty (2014) believed that lower ability learners must be able to attempt at least some of the tasks set, with higher ability stretching learners with some tasks. A solution is to create a platform of activities from fairly easy to more challenging tasks. It also helps if lower ability learners are required to take the extra time they need to learn effectively. Confirmation from neuro-scientific research suggests that alterations in brain structure and purpose between boys and girls also show different learning styles. According to Welsh Assembly Government (2008), equal opportunities policies have molded the way all learners are given the same opportunities, there is opportunity to consider whether learners are succeeding the best outcomes in relation to ability or whether more suitable activities could be provided to meet the needs. Having the class split into different ability groups helped with the ratio of staff and learners' abilities. Especially when a member of the class has difficulties in moving around from one area to another, due to physical needs.

According to Wallace (2011) it suggests that if groups are divided up from friendship and clique groups, it can benefit them better in the long term. There are many different strategies, that can be utilised to ensure the working groups are not always together, to ensure a good result for children.

The Health and Safety section in the activity plan is considered in all areas. However, this section would benefit from further risk assessments knowledge, which can be found in various policies, that can be found in all settings.

According to Work Well Health and Safety (2014), schools are required to have and provide a fitting and sufficient assessment of the risks presented by work activities to the health and safety of its learners and staff members. The law does not expect the establishment to eliminate all risks, but there is a requirement to protect people as far as is reasonably practicable. The whole purpose of the assessment process should help the establishment whether they have taken enough precautions or should do more to meet the legal and national regulations. This concept is also supported by Estyn (2020), who consents its responsibility for sheltering employees and others affected from the risks generated by any work activities. Estyn is dedicated to providing a safe working setting where risks are measured and controlled accordingly. Protected and suitable equipment is specified and where members of staff receive satisfactory information, training and guidance.

Resources

The resources that were listed in the activity plan were relevant and well used. The use of the woodland was a vital part of the lesson. Letting the learners use nature and natural objects, giving them a real-life experience using their knowledge and findings. According to Montessori Nature (2021), implies that nature offers a variety of infinite ways to support young learners with their cognitive, physical and emotional growth. Though nature does not roll out the work that can be completed in the classroom. However, Montessori believed that teaching staff and parents lacked understanding, the benefits on what natural surroundings offers, where learners miss out on astonishing opportunities.

Though it is important that natural resources are used and benefit the learners in many ways, it also best to consider that the contrast between manufactured mathematical resources vs loose parts. Both are effective and support the learning in different ways, as both have specific learning outcomes. The School Run (2021b), states that Numicon for example is aimed to make numbers real for learners and being able to see and touch them. The Maths mastery approach that is used in various settings,

providing a concrete object to represent each number. Also, it has been proven that it has a multi-sensory method that's known to support learning. Learners become more familiar with the pieces, and start to call them by their number name, learners become more dependent on these objects. However, The Teaching System (2021), argues the fact that natural open-ended resources provide a bigger range of opportunities, to which learners in their unique state or they imagine it to be something else. Old plastic ways of teaching are dated and specific to its use. Schools should encourage more natural open-ended resources and loose parts in the learning environments.

Resources that are available in the setting need to be purposeful and have a wide range of diverse use. Independent Education Today (2021) suggests that having a wide range of resources and a well-planned environment, encourages curiosity, prompts the need for more complex language, encourages talk, questioning and storytelling. Having a specialised range of resources provides high-quality learning, such as Natural objects and artefacts, small world figures, scenery and props, role play costumes and small construction.

With these carefully selected resources, it is important to consider how well each of the classroom are set out and that every corner as an opportunity for learning. However, Scales (2008), indicates that in many cases teachers will be producing their own resources. It might vary from straightforward design or production printed resources from various websites. Piaget (2005, cited in Eric.ed, 2008) supports the concept of the environment as a resource for learning to develop across his recognised primary stages of development. These areas were used to apply, demonstrate and support cognitive development, these were sensorimotor, preoperational, concrete operational, and formal operational.

Role of the Adult

The role of adult in the activity plan is mainly explained as being a very hands-on process. However, the plan would benefit from demonstrating further opportunities for the learner by taking a step back, allowing the learner to learn, by letting them explore, play more and observe and record the findings. Sir Ken Robinson (2016, cited in Rethinking Childhood, 2016, no page) underlined a good point in his presentation stating, 'Play is a highly beneficial and deeply natural way in which children learn...

Play has deeply important roles in the development of intellectual skills, in social skills, in developing empathy, in stretching their imaginations and exploring creativity’.

Recording learners’ use of a variety of activities or play scenarios, supports practitioners on monitoring how learners use their time, their certain interests and any gaps in their understandings, so that practitioners can plan a stable curriculum that takes note of learner's strengths, interests and needs. This concept is supported by McClary (2016) who supported Bruner’s concept of scaffolding. Scaffolding is the action that an adult play to support all learners in educating something that they cannot grasp or comprehend. Scaffolding can include modelling, making suitable proposals and or organising learning into practical parts.

It is important that the learners’ progression is at the top of the list as practitioners. The role of the adult will always be a front-line duty within teaching settings and establishments. This theory is supported by the Welsh Assembly Government (2020), stating that the statements of what matters are the basis of learners' progression. Key ideas and principles within the statements will develop their learning. Learners making progress in their learning, contribute to the four purposes of the curriculum.

Welsh Assembly Government (2015c) indicates that the Donaldson report also supports this by practitioners including other methods of numeracy such as arithmetical and data-handling skills. Young learners need regular chances to expand their understanding of number. It is essential that all teaching staff and other staff members who work with young learners have an understanding of how best to strengthen these abilities and take chances to combine learning appropriately.

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