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Cynllun Gweithgaredd Activity Plan		
Gweithgaredd: Activity: Children will be read a story book (The Hungry Caterpillar), then create and explore using natural resources that they can find outside in order to build and create things they can in relation to the book, such as homes for the characters, food, etc.		
Nifer o blant: Number of children: 4	Oed y plant: Age of children: 3-4 Years old.	Nifer o oedolion: Number of adults: 1
Lleoliad: Location: Both the story book and play afterwards will take place in the garden of the setting (childminders).	Amser paratoi: Preparation time: 1 hour- Ensuring that all parts of activity are safe and in order for the children to begin (in particular the creative part of activity where children explore garden independently).	Amser gweithgaredd: Activity time: 15 mins- For reading, interacting with and understanding the book. 45 mins- For the creative time with the resources outside.
Adnoddau:		

Resources:

- The Hungry Caterpillar book.
- Children's pots, pans and tools for the garden.
- Children's scissors.
- Any natural resources that the children see fit for their activity.

Amcan/ion y weithgaredd:**Aim/s of activity:**

- Promoting young children's mathematical concepts and numeracy skills.
- Promoting young children's understanding of surroundings and the world they live in and how they learn from it.
- Promoting young children's creative and imagination skills.
- Promoting young children to become independent and capable learners.

Cysylltiadau â deilliannau:**Links to outcomes:**

The Foundation Phase (2015) outlines outcomes that this activity links to, these include:

- The children will be able to select appropriate equipment and resources and apply these to mathematics, such as using objects to count.
- The children should realise that anything can be counted, not just objects, e.g. claps, steps during the book.

- The children should be able to count reliably up to 5 objects, they may do this whilst completing their activity after reading the book with the natural resources that they find.
- They then should be able to compare and order numbers to at least 5.
- The children should use mark making to represent numbers in play activities that can be interpreted and explained, such as, for example, using leaves to create the shape of an apple they will be able to show how many leaves is 1 or 2.
- The children will be able to understand and use the concept of 'one more' or 'one less' in their play.

Gwahaniaethu:

Differentiation:

Structures will be put in place in case of the event that a child would need one-to-one help with their activity. Although it is impossible to tailor to each single need of every child in all activities, this activity should aim to encourage children to achieve their fullest potential no matter their ability or skill starting points (Government of United Kingdom, 2019).

Iechyd a diogelwch:

Health and safety:

To conduct this activity there are a number of health and safety factors that need to be considered beforehand, especially due to the fact the activity is based solely outdoors. Some of these health and safety factors include:

- Ensuring the area is clean and safe.
- Ensuring children are wearing suitable clothing, such as raincoats and wellies if it is raining or hats and coverups if it is in summer.
- Ensuring all equipment and resources are age appropriate and used in an appropriate manner.
- Ensuring there is enough space for the children to complete the activity to achieve the set outcomes.
- Ensuring children are free from risk that may cause severe injury.

Rôl yr oedolyn/oedolion:

Role of adult/adults:

The role of the adult in this activity is to aid the children in their learning as much as possible whilst also allowing them the freedom to be creative and learn independently. The adult will start off by reading *The Hungry Caterpillar* to the group of children and asking questions and engaging with the children in relation to the book. The adult should be available if the children were to need help or guidance. The adult should be present to enhance the learning of the children by asking questions that spark mathematical thinking in the child, for instance questions involving quantities and measurements; these questions may include things such as “how many?” or “how long?”. The adults should be aware of when mathematics presents in play and support and extend this alongside the children.

Y weithgaredd:

The activity:

The activity includes the reading of the story book 'The Hungry Caterpillar' to four children between the age of 3-4 years old. Fifteen minutes was set as it allows the children to understand and interact with the book in order to gain full understanding and gain their own interpretations. The children will be encouraged to find and join in on patterns and rhymes in the book. The children will then discuss attributes from the book such as characters that they would like to create in the activity.

After the story time and interaction of the book the children will have 45 minutes to explore and create what they have interpreted from the book. These interpretations may be things such as food mentioned, characters mentioned or other factors they can imagine such as homes for the characters. It will be child-led, as although, there is a theme to the task they are then given free rein on what they would like to make or create in relation to the book and they can also choose to work together or independently. The children will be encouraged to find natural resources outdoors and then create whatever they feel with the resources that they have collected. The children will use a range of mathematical skills during this time of exploration and creativeness. The children will learn aspects of counting, measuring, exploring new shapes, witnessing different sizes and classification. Some examples of when the children may do this would be for example, counting, the children may be counting when collecting items and bringing them back.

Evaluation

The planned activity aims to support children to engage in the development of mathematical goals and to understand a wider range of mathematical concepts. The activity is child-led and allows the children to grasp mathematical concepts through the medium of play. The Foundation Phase (2015) pedagogy explains that different types of play should be used to support mathematical development. The plan details how children will be finding natural resources to use independently in their activity, this as explained by Knight (2011, cited by Tucker, 2014, p.25) children are creative outdoors which will in turn stimulate creative mathematical thinking.

The activity enables children to use their independence as they will decide what they make and what they use to make it. By learning through the outdoors with natural resources children allow for the development of concepts that may be abstract to the child, this is supported by Montessori International (2015). Government of South Australia (no date, p.2), suggest that using natural resources within play can have benefits such as sensory and creativity. Montessori International (2015) supported this by using "Montessori Philosophy" to support mathematical development on a daily basis (p.23), he described the Montessori philosophy as children finding maths in simple tasks; such as picking up leaves. Montessori International (2015) suggests that children would question mathematical concepts such as quantity, size, measurements and weight in simple tasks (p.22). This suggests a strength in the planning of the activity as it allows the children to confidently use their surroundings and the natural resources around them to build on their mathematical approaches.

A further strength that this plan proposes is that it allows the child to partake in child-led independent play. By the children engaging in independent play and using their

own initiatives to make decisions and test out different strategies and mathematical concepts it allows them to gain a richer concept and learning of mathematical concepts through role play (Smilansky and Shefatya, 1990); such as, using measure in this activity. This is further supported by the work of Piaget (1964, quoted by Wood, Smith, and Grossniklaus, 2001, p.5), who believe that children learn best when they take the knowledge they have been told and build upon it through play and exploration. Piaget further suggested that children need hands on learning in order to fulfil opportunities to learn complex concepts such as maths. Donaldson supports this as in the New Curriculum for Wales (2015) says that an integral part of learning in the new curriculum is broadening children's horizons, encouraging and stimulating imagination and promoting enjoyment in learning (p.40). Clifton (2016), believes that children learn best when children are able to see first hand what they are learning. Clifton (2016) suggests that by learning mathematical concepts, such as matching and sorting into groups, by the means of play it allows the children to gain confidence in their problem solving skills.

A negative that could be taken from the plan would be the lack of technology used within the activity. As the children are learning in an outside environment there is no technology incorporated into the activity. Blatchford and Whitebread (2003, p.1), suggest that technological literacy is an increasingly essential part of the learning in order to achieve a "broad and balanced" curriculum. This is supported by the further work of Blatchford and Morgan (2013), as they suggest that ICT in play when working outdoors could be ideas such as doorbells when making dens or answering phones during role play (p.5). The book allows for several technological and mathematical elements to be incorporated such as use of sounds that could be created then recorded for example. The Digital Competency Framework (2008) highlights a range

of digital goals that children should reach in the early years, one is the ability to use digital devices and media with care, by doing so the children will develop their mathematical skills to go onto reach another goal included in the framework which is gathering data and understanding the different types.

An aspect of the plan that could be reconsidered is the choice of book. The choice of book proposed is "The Hungry Caterpillar". This book allows for several mathematical elements incorporates such as patterns, shapes and sizes. However, it may be argued that a book that allows more interaction could be used; for example, a book that links to a song or includes a rhyme. Williams (no date) supports this notion and suggests that rhymes can support and encourage children's interest and understanding in numbers, patterns and mathematical language. By reconsidering this it would allow the children to gain a deeper mathematical advantage as although there is clapping and interaction that is incorporated into the activity there could be a stronger link if a different book may have been used. Geist (no date) supports the notion that activities such as rhyming, clapping and creating and keeping sequences encourages mathematical development by recognising one-to-one correspondence and identifying and predicting distinct patterns.

Health and safety is a considered as part of the plan that should be looked upon thoroughly. A risk assessment needs to be completed in order to evaluate and plan for any risks that may cause serious harm. The plan details the need for a risk assessment and how this will be undertaken. The Statutory Framework for the Early Years Foundation Stage (2017, p.29) states that practitioners should ensure that all play spaces "including overall floor space and outdoor spaces, are fit for purpose and suitable for the age of children cared for and the activities provided on the premises".

The resources stated in the activity plan include resources that are essential for the task, for example the storybook. The storybook, that promotes mathematical thinking and skills, is the starting point of the activity and therefore is an essential. Carter (2009, quoted by Bintz and Moore, 2019, p.35) supports that storybooks with mathematical themes can engage children in mathematical topics. The resource list includes resources that any child finds and sees fit to use for their activity. The children will find the resources to use outside as according to Bronda (2007, p.3) when playing and exploring outside children are able to gain experiences and opportunities through unexpected and unplanned ways. These resources will not be limited and it is what the children would like to use. The activity will include loose parts to give the children freedom in what they make and play with. These loose parts can enhance mathematical learning by encouraging counting, recognition of numbers and one-to-one correspondence (Lipp, 2021).

A part of the plan that could be reconsidered is the need to for additional support for children with additional learning needs. The plan states the structures will be put into place for children that may require extra support from practitioners for each child to fulfil their greatest potential. The Foundation Phase framework (2015, p.7), states that settings should “offer opportunities for all children to achieve their full potential in preparation for further learning and life”, they go on to say that if necessary practitioners should plan to work with specialists when working with children with additional learning needs. The three suggestions that the Foundation Phase framework (2015, p.7) give that should be aims for the practice are making the curriculum more accessible for the child, making physical improvements if needed to make learning more accessible and providing information in appropriate formats. The

Foundation Phase framework (2015, p.7) states that all children should be engaged as full members of the setting working independently and alongside peers.

Discussion

Practitioners are responsible to provide resources that enhance learning and creativity in the early years, practitioners have the responsibility to use their resources carefully to tailor to the child's needs and interest to the curriculum (Department of Education, 2017, p.25). Williams (2008) supports this and suggests that children develop mathematical skills most effectively through play involving a wide range of resources (p.36). Practitioners need to take on a proactive role during the mathematical development of children as "spontaneous free play, while potentially rich in mathematics, is not sufficient to provide mathematical experiences for young children" (Anthony and Walshaw 2007; Gifford 2005). Tucker (2014) maintains that practitioners hold a great responsibility for enabling the mathematical development of the children by modelling mathematical language and providing time, space and open-ended resources (p.5). Tucker (2014) further develops this view and speaks upon the importance of effective pedagogy for the mathematical development of the child. A principle into practice of effective pedagogy suggested by Tucker (2014, p.8) is to plan and prepare stimulating environment both indoors and outdoors to ensure that children can explore and play creatively.

Enabling environments for children to use maths in play and can be done using resources planned by the setting, such as using money in role play and sorting objects, for instance leaves, into groups (Foundation Years Organisation, 2012). Further as discussed by Tucker (2014) consideration needs to be given to both the indoor and outdoor environment.

The use of natural resources compared to plastic is debated within childcare settings. Nicholson (1972, as cited in LECS, no date), comments that an environment is at its

best for learning with aspects such as inventiveness and creativity through resources that are in the setting. Tucker (2014) supports the notion that using natural resources allows potential for “creative and cross-curricular” development (p.13). Natural resources can be used by practitioners to encourage children to think mathematically, for example how high children can build stones or how what shapes they can make them (Government of South Australia, no date, p.5). Within the foundation phase (2015) the approach to maths should be holistic, this supports Ranheim (no date) who implies that loose parts can be utilised through play to support and encourage mathematical thinking. Tickell (2011, cited by Tucker, 2014, p.3) supports that through active explorative play children are supported to think creatively and critically and this she says is a key skill for mathematical disposition.

The activity planned is outdoors, Pratt (2011, cited by Tucker, 2011, p.22) says that in order for children to succeed in maths they need to build a “mathematical disposition” and to do so they should be able to explore the outdoors and make mathematical links to the world around them. They will then build an awareness that maths is all around them in their everyday life. This is further discussed by Tucker (2014) as it is important that practitioners encourage children to make connections in life and problem solving; the children will becoming aware of problem solving as Tucker (2014) claims that opportunities present themselves in everyday routines such as practitioners counting how many more or less children are at the setting (p.5).

Children learn when trying new ideas, the outside environment allows children to explore the maths around them by collecting natural objects to sort, order and be creative with, they can explore and play games that develop their mathematical language and thinking, for instance, digging in sand pits can allow children to become

aware of capacity. (Sargent, 2015, p.5). Furthermore, practitioners should aim to create an enriched mathematical learning environment by careful planning and consideration of resources (Drews, 2007, p.22).

Explanation

Children learn mathematical thinking and concepts through experiencing through observation; it is the role of the adult to provide practical experiences for the child without applying pressure on them to do the same straight away (Pound, 2006, p.73). This view is furthered by Brighton-Hove Government (2012) as they suggest that the role of the adult for mathematical development is to observe children when learning and to ensure appropriate intervention to further enhance mathematical thinking. Such interventions include engaging in sustained shared thinking to scaffold the learning of children where appropriate (Bruner, 1966, cited by McLeod, 2019). Pound (2006) discusses how that few people have positive attitudes on maths and therefore pass on this negative attitude to children.. Brighton-Hove Government (2012) maintain that the role of the adult is to encourage positive attitudes and dispositions towards learning maths. The foundation phase framework (2015) supports this and comments on the need for active learning opportunities to enhance capable and creative learners who are confident in their mathematical development. The role of the adult in learning and mathematical development is to aid in the zone of proximal development, (Vygotsky, 1978-1986 cited by Smith and Price, 2012, p.9). The play that best supports mathematical learning is a mix of child-initiated and adult-supported (WAG, 2008, as cited by Tucker, 2011, p.3). Therefore, Smith and Price (2012) support that adults need to observe what a child can do unaided and find ways in which they can support them to reach the next mathematical development stage by providing a stimulating environment.

Practitioners take on the role of monitoring and assessing the children progress. The early years foundation stage profile (2018) requires practitioners to track the progress

and development of each child. Practitioners take on-going assessments as well as an end of the foundation stage assessments. The Early Years foundation stage profile (2018) suggests that a useful and reliable way to capture the skills and knowledge of a child is through observation. The EYFS (2018) says that practitioners should watch, listen and observe as children play. Brown (2020) maintains the fact that children are best when observed through play, she says that practitioners should aim to provide enriched learning environments tailored to the child's needs in order to achieve the best and most accurate observation. Essex County Council (no date) comments that assessing and observing children allows for practitioners to develop their setting in a way that is beneficial to the development of the child. The early years foundation stage assessment profile (2020) further develops and supports this by commenting on the use of the assessments as a useful source of information about the development of the children and the needs of them in key stage 1, it allows practitioners to identify issues early on and support the development of the child as much as they can. The Welsh Numeracy Framework (2021) is used to assess the development of the children in relation to mathematics. Within the framework are set goals that children should reach in order to show their mathematical development to practitioners; these include task such as use of mathematical language and use of mathematical knowledge and practical experiences to inform estimations.

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