



PART 1

Source: Holborn (2022) Personal image.

PART 2

The photo in part 1 of the garden gives plenty of opportunities for children to develop scientific and mathematical ideas. (Age 6–7-year-olds) We observe as practitioners according to the curriculum.

Plenty of loose parts can be added around the garden area. Weighing scales, tape measure, rulers, books on insects/ flowers and vegetables, magnifying glasses, paper, crayons, tyres, watering can, small spades.

Child A wonders over to the pumpkins and points in shock at how big they are. “Miss, look at these pumpkins? Why are they all different sizes?” gives me the opportunity to explain how plants and vegetables grow which covers progression step 1 of the curriculum in Wales which states children should recognise that plants and animals are living things which grow.

Me: “I wonder which one is the heaviest, and how can we measure?”

Child A looks curiously and points to each one, using hand gestures to try and measure with their hands, before running to grab the weighing scales and tape measure and proceeds to weigh and measure with another child and records the results on paper. The two of them count out loud how many there are altogether.

Me: “I wonder why the pumpkins grow on the floor?”

Child B:” because they are too heavy, so they have to grow on the floor”. The child runs over and grabs a magnifying glass before using it to look at the pumpkins and the patterns on it, then moving along to look at the other plants and vegetables.

Child A says to Child B:” Look, I see something! Go and get one”.

Child A:” I can see an insect”

Magnifying glasses encourages the children to learn about life cycles.

Me: “Oooh, how many legs has it got? How can you find out what they are?”. Child A runs to the books laid out on the floor and picks one which identifies insects and plants in gardens and curiously looks through with child B helping each other to identify different insects and plants.

Me:” What insects needs flowers to feed from?”

Child B:” Bees”, with Child A proclaiming, “wasps too”. They both have a discussion amongst themselves about why they need nectar. I ask, “I wonder what would happen if we didn’t plant flowers?”

Child A: “they would die:” with child B stating that weeds have flowers, and both walk around the garden observing and counting how may weeds with flowers there were.

I observe another two-child walking around with a ruler measuring the broad beans growing telling me their findings of which one is the longest and fattest.

Me: "How can we record the measurements?" One child runs to grab some paper and a pencil and starts measuring putting his results down on the paper with the other child communicating back with more measurements.

Child A and B run up and tell me, "These look like they do in the shops, are they ready to eat?"

Me: "Remember we talked about how the plants and vegetables grow at different stages. What do you think?"

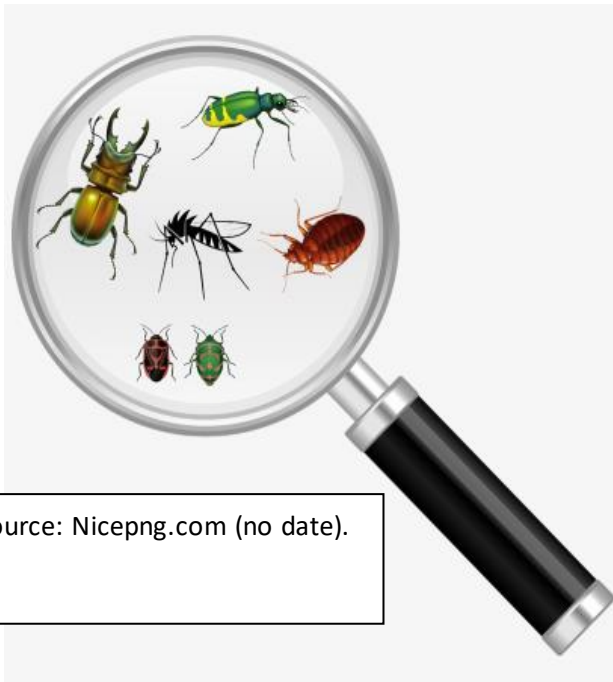
Child A: "Yes, this one has, it had all the sun and the rain!"

Child B: "These are ready too; we need to pick them off now"

Me: "Look at the others? How many are looking like a flower? Does that mean they are ready to pick?"

Child A: "No, because they are still growing because they need more sun and rain".

Child B: "What would happen if we didn't have any rain?"



Source: Nicepng.com (no date).

Child A: "They will die but we can water them" and runs over to grab the watering can asking if they can water the plants.

Child B: "Make sure you water the soil and not the leaves or they will burn in Remember the

Me: "Where does the water need to go?"

Child A: "The roots suck up the water to help it grow".

Child A to Child B: "Remember the watering song?"

They sing, "1,2,3,4,5 water keeps our plants alive. 6,7,8,9,10 to be sure we

will do it again. Why do we water so? Water helps our plants to grow, If we count we'll get it right, then our plants will be a sight".

I observe a couple of children filling in a tyre with some compost left in its bag and using a small spade. By allowing children to play in mud and explore, we are using the curiosity part of the curriculum, progression step 1. (Welsh Gov, 2021).

Me: "What do we need to add next?"

Child A: "Plants".

Me: "I wonder how a plant starts off before its fully grown?"

Child A: "seeds".

Me: "How much sunlight does this spot get?"

Child A: "Always, so the sun can reach it".

Me: "I wonder what would happen if it was in the shade and doesn't get any sun?"

Child B: "won't grow quickly".

Child A works together with Child B and asks how many seeds to plant.

Child A: "About 5 but make sure you space them out as my grandad tells me that when I help him".



Source: Ugao.com (2016).

A child was looking at some vegetables ready to harvest.

Child A: "Miss, these look like these that are in the shops!"

Me: "Do you think they are ready to eat? How can you tell?"

Child A says that its because they are red and counts how many are there but asks what the green ones are.

Me: "Remember we talked about how the vegetables and plants grow at different stages?"

Child A recalls and says how the red tomatoes have had all the sun and rain. This is As some were still in flower, I asked the child if they were ready to pick.

Child A: "No, because they are still growing"

Another child interacts with them as they stand by the carrots.

Child A:” If this is a carrot plant where are the carrots?”

Child B:” They are underneath the mud”.

Child A queries how is that so and child A explains and helps to answer.

Me:” Can you tell me more why you think that?”

The children end up pulling a carrot up out of the soil and realise they are ready to harvest. Me;” They are ready to harvest, pull some more out, I wonder which one is the longest?” As one child grabs the ruler and measured the carrots.

As a practitioner I observed children getting the paper and crayons and picked up fallen leaves to do rubbings of them which links in with the curriculum as ‘properties of materials’ are recommended (Welsh Gov, 2021). I also observed a child tip toeing trying to reach taller than the canes used for the broad beans. Various questions were asked to various children to associate with maths development E.g., “How many different colour vegetables can you see?,” “How high is the tomato plant?”

Sarah Elizabeth Holborn

RISK BENEFIT ASSESSMENT

Location / Activity:	Gardening	Date:	27.09.2022
Assessor:	Sarah Holborn	Review date:	

The boxes in the table below will expand as you type into them; pre-entered text is simply for illustration. You should delete irrelevant items and replace with text relevant to your circumstances.

Your overall risk rating – Low, medium or high – is based on your judgement about whether the BENEFITS of the activity or opportunity outweigh the RISKS.

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury
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Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury
Children exploring flowers, insects and mini bugs.	Children have the opportunity to explore and learn about other living things and the relationships between plants, vegetables, habitats and life cycles. Gross and fine motor skills will be developed when bending and so on. Children will become more aware of other living things and become ethical citizens as they show kindness to other living things.	At certain times of the year there will be a profusion of different insects, E.g., bees in spring/summer . Wasps in the summer. Red ants in spring/summer/autumn. Possible bites/stings/ allergies to any bites. Children need to be aware of any irritant plants. E.g., stinging nettles Children may wander off	Children and adults	Consider the boundaries with the children, making them aware where they can go/ with an adult or not. Discuss with the children the things that might be surprising and new. Make up Golden rules. Tell them to put nothing in their mouths and to wash hands and the end of the experience. Teach children to recognise the insects and help them to identify the difference between them whilst also helping them to understand why the insect are helpful in the garden. Encourage children to be mindful of other creatures that can live in the garden. Remind them that they aren't always harmful such as hedgehogs, frogs or birds, but that it is good practice to garden safely and be careful not to disturb them or injure them

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury
Being outdoors in different weather conditions.	Children will become aware of different temperatures if words are used such as hot/cold/wet/dry. By identifying possible harmful things in the environment, children can act to reduce the risks to themselves or others whilst also becoming aware of self-care and monitoring their own risk.	Children maybe too hot or cold and in extreme cases cause hyperthermia or too much sun exposure causing heatstroke and sunburn. Children may become wet causing them to be uncomfortable and distressed. High winds can cause trees/branches to fall causing head injuries. Slippery ground from the wet weather can be a hazard if children are not careful.	Children and adults	The weather needs to be monitored. Appropriate clothing needs to be suitable for the weather. Suncream, hats and water being made available. Waterproofs, warm layers of clothes. Point out the risk of slipping if in wet weather and insure appropriate footwear needed.

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury
Planting seeds and flowers	Social interactions between children and between adults and children. Knowledge about nature, seasons, plant care and the understanding of life cycles.	Ingestion of inedible seeds or fruit leading to indigestion or upset. Some plants can cause allergic reactions for some individuals e.g., grasses can cause hay fever. Other plants have poisonous parts if eaten. Bulbs can be toxic if eaten such as daffodils.	Children and adults	Provision of hand washing facilities and a 'golden rule' stating that nothing is to go into their mouths that shouldn't and the importance of staying safe.
Harvesting ripe fruit and vegetables	Attachment to nature including understanding food production and life cycles. Feeling of emotional and physical wellbeing	Slips, trips, falls?	Children and adults	Provision of hand washing facilities and a 'golden rule' stating that nothing is to be eaten until hands are cleaned.
Watering plants				

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury

PART 4

Piaget referred to children as little scientists and through symbolic play they make sense of the world (Aubrey and Riley 2017). Research shows that in an environment where children can have the opportunity to play and explore, with the support of their teacher, are afforded opportunities to be these creative little scientists (Cremin *et al* 2015). According to Warden (2020), outdoor areas should offer children varying, adaptable and dynamic environments for all types of play, giving the child a chance to create, rule and use the play area through open ended play, whilst also demonstrating inclusivity and valuing diversity according to Warden (2020) and Welsh Government (2021). As according to UNICEF (no date), article 31 states that play is a fundamental right for all learners.

Froebel believed in the value of play outdoors. Through creativity supported by a nurturing environment, children have the chance to represent their own ideas in their own way and that the rich, sensory first-hand experience helps a child's growing mind as he believed through real life experiences children learn about the interrelationships of all living things. The experience of the natural world outdoors was crucial for the child to appreciate its wonders according to Tovey (2013) and Froebel Trust (no date). His principles are used to this day as guidance for the new curriculum in Wales stresses that the outdoor environment needs to provide opportunities to influence awe and wonder, to allow the child to explore in a relaxed and stimulating space (Welsh Government 2021). The Reggio Emilia approach describes the environment as the third teacher, suggesting children can construct their own learning (Reggio Emilia, no date). Research similarly suggests this. Campbell and Speldewinde (2020) concluded that forest school approaches taken up in Australia, in terms of affordances, finds that the natural environment supplies materials both fixed and loose, enabling children to learn science through play with children themselves becoming agents of their own learning. Waite (2011) goes on to say the environment 'affords' to different children at different stages of their development and the practitioner needs to be aware that the interaction between the child and the environment cannot be decided by them.

White (2014) describes how adults need to be passionate and insightful and are pivotal to unlocking the potential of the outdoors, however, goes on to say there is a danger of losing and taking away what is unique for children if practitioners take the indoors outside as it is the child's domain to explore and learn through feelings and actions. An enabling environment, through practical and visual opportunities will help scaffold the development of children's mathematical concepts. For example, through opportunities to experience number, pattern and shape in the outdoors as stated in the new curriculum guidance (Welsh Government 2021). White (2014) suggests that learning is more successful when children share their experiences with other children and adults. Possibilities are opened for them as the rich provision provided by the adult allows children to interact and for adults to guide in their play and interactions as per Froebel's notion (Froebel Trust, no date). Welsh Government (2021) states in the guidance that adults should observe, notice and respond sensitively to the learners needs, deciding how and when to support and intervene. Piaget agreed and believed that teachers should aid rather than teach. Rather than

transferring knowledge to the learners, they should present children with problem solving, emphasizing the importance of a child's independent exploration of the environment which differed to Vygotsky who believed that social interactions were paramount for children's learning (Aubrey and Riley, 2017).

The use of loose parts enables children to further improve scientific and mathematical thinking as well as helping to improve problem solving skills and the use of creativity as the opportunity arises from playing outdoors according to Rahardjo (2019) whose research evidently showed that mathematical skills integrated in the child's process of learning are patterns, measurements, geometry and number operation when loose parts are used. Froebel stressed the importance using natural and man-made materials to support rich, first-hand play (Tovey 2013). Research shows that through the making process, children were exposed to engineering as they processed problem solving when loose parts were provided to the children, and they dealt with many problems. The process of problem solving is in the heart of engineering practices according to Park and Bates (2018). Rahardjo (2019) concluded in her research how loose parts supports science and maths in learners through the child having to problem solve. One of the science process skills is when a child observes things carefully and as loose parts can create problems in their creativity, thus it supports science and mathematics. Robinson (2017) explains how Nicholson's theory of loose parts is defined by not only natural junk and recycled materials but also when a child is using includes gravity, concepts and ideas in their play as well as open ended materials. Froebel agrees in that a child in engagement with gravity, gradient, speed, energy and such things links to maths and science outdoors (Froebel Trust, no date). White (2014) also agrees by saying loose parts fosters a child's creativity and imagination, helping to develop these skills as well as cognitive. For example, mathematical thinking for size, shape, number and measurement as well as through observation, construction and pattern making.

Froebel believed that play needs sufficient space both indoors and outdoors (Tovey, Waite (2011) says that even a small area can offer movement and sensory exploration if the area is planned well.

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