

Part one



Part Two

The photograph shown in part one is of a woodland area, the woods is in quite a built-up area with a lot of new housing developments going on locally, which has taken up quite a lot of the green spaces within the community, therefore areas like this are becoming increasingly important not just the wildlife and plants that are native to the community, but also to the people, affording them the chance to explore, experience and enjoy natural habitats, particularly children, as nature provides endless opportunities for children to investigate and make sense of the world around them.

The picture shows a very shallow stream approximately 2 inches deep, the bed of the stream has stones in a range of assorted sizes, from small pebbles to larger heavier stones, there are also some logs and branches that have fallen from the trees which line either side. The picture also shows reflections and shadows on the surface of the water from the sunlight coming through the canopy of the trees above. The banks of the stream have varying gradients with uneven ground, one side of the bank being quite steep the other with less of an incline. There are various species of plant life growing along the bank, as well as fallen leaves on the higher ground. This environment provides many opportunities for children to develop scientific and mathematical concepts.

Activity 1

Bringing balls of assorted sizes and textures for the children to roll, they might first start off by rolling them on the higher ground which is slightly uneven, this can be done as a small group activity of maybe 3 children, each child has a ball of varying size and texture, this give the opportunity of comparison, I could ask the children questions such as “which ball do you think will go the furthest?” and “Why might that be?” get the children to swap balls so they each get a turn to feel the mass and the properties of each ball and experience how that can have a different outcome on how far the balls might roll. I could ask the children “what do you think might happen if we roll them down the bank”? The children could then roll the ball down the incline of the bank to the stream. As before the children will have the opportunities to use all types of the balls. As well as the mass and properties of the ball the children will now experience how each ball reacts with gravity. I could ask the children “which do you think might be the fastest”? “Why was the spiky ball slower than the smooth one”? Or making comments to the children that the heavier ball was fastest, and the lighter ball was the slowest. As well as the physics of how the ball is moving, the children will also be engaging the biology of their vestibular system to keep their balance whilst squatting or crouching at the edge of the incline understanding where they are in space. The next step in this activity could be to encourage the children to try and roll the ball up the bank of the stream, felling the force of gravity against them this time.

Activity 2

Bring along baskets and or buckets to the woods, let the children explore the environment and collect some natural items, such as stones, leaves, twigs, acorns, conkers anything that takes their interest. Children can then group together items which may be the same or similar, for example leaves could be grouped together their colour and shape. This may need to be modelled by an adult for young children. The children could be asked questions such as, “where do you think this one should go”? Or “Are there any that look the same”? The twigs can be used to discuss maths concepts such as longer, shorter, thick and thin. By lifting the stones, the children can begin to explore weight, with an adult modelling language like heavy and light. This activity could be extended by encouraging the children to discover if their

chosen items will float or sink in the stream. This activity will introduce the children to density and buoyancy, if an item is dense, it will sink and if it is buoyant, it will float. The children will place their items into the water, the adult might comment saying things like, “Oh look your leaf is floating, it’s on top of the water”. Or “The stone is sinking it’s gone under the water”. Allowing the children to repeat the process over and over so they can see for themselves what floating and sinking looks like. The adult could then ask the children “Do you think the leaf will sink”? Allowing the children to hypothesize based on what they have already experienced. The children may want to throw or drop the objects into the stream instead of placing them, of course there will be no difference in if they sink or float the outcome will be the same, but it can again let the children build on what they already know. By throwing or dropping stones into the stream will cause a difference on the water's surface, a rippling action as the water is displaced to create room for the volume of the stone. This can be described to children “Look the water is moving to make room for the stone”. As children use different stones, they will see either more or less movement in the water “The big stone made a bigger splash”. The larger the volume of an object the more displacement of the water. Also, the force with which the stone is thrown will change the water’s surface more drastically. Comments like “That was a hard throw, look how big the splash is”. Once children have had time to investigate and observe the outcomes of their actions. The adult can again ask the children as to what they think might happen.

Part three.

RISK BENEFIT ASSESSMENT

Location / Activity: Woodland walk A walk in the woods

Date:

Assessor: 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 Overall risk RATING: L/M/H

discovering the world through real experiences that afford creative thinking and problem solving, both of which are needed bi mathematical and scientifically development

exploring a natural environment in their community. children can gain an understanding of their local community, and through interactions with nature and the materials and resources that are naturally found in the outside environment, can afford children to develop an understanding and consideration of the local wildlife, i.e animals and plants, and what may need to be done in the future to preserve the local environment

skin discomforts may occur due to allergic reactions, due to nettle stings, or any other kind of foliage growing in the area children, staff

through risk assessment to take place prior to visit to the woods, to assess if the plants, trees and any other foliage growing in the area is likely to be an irritant.

also have a full knowledge of allergies/irritants of all children and staff in the setting.

bee/wasp stings, irritation to plant life

children and staff to wear protective clothing, that covers the arms and legs fully, to protect against plants/trees that may be allergens. as well as insect stings.

any child or adult that has a know allergic reaction, their health care plan and any medication, such as an anti histamine and or epic pen is taken on the outing, and checked prior the leaving setting.

children are able to see first hand where, fruits and berries are grown. with the help of an adult children are introduced to the life cycle of living plants, how they are started from seeds at the very beginning and how they progress on to bare fruits, leaves etc.

berries and fruits may be ingested, causing poisoning and in some cases even death children

prior to the outing adults talk to children, about the rules and tell them clearly, that whilst in the woods nobody is to eat anything they find , as it could make them really poorly (have a really bad tummy)

All children are closely supervised within the NMS ratios of 1:3 outside of the registered area.

Part Four

Introduction:

How adults working with early years children can support and encourage children to engage with mathematical and scientific concepts in an outdoor environment. Outdoor play is essential for children's physical, social, and emotional development. The early years are a

critical time for children's learning. During this time, children are developing their foundational skills in mathematics and science (Vygotsky, 1978). When children are given the opportunity to play outdoors, they are free to be creative and to explore their imaginations. This can lead to a lifelong love of learning and a sense of wonder about the world (Oberle et al., 2016).

When Friedrich Froebel opened his first kindergarten in 1836, he understood the importance play had on early childhood learning, and that children would develop an understanding of the world around them through experience with their environment, Froebel also believed that children needed real experiences to learn. Froebel Trust (2020). Moreover Balani (2020) suggests that if children are given the space and time to explore, their natural curiosity and imagination will begin to develop.

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Play-based learning and loose parts:

Play is essential for young children's development and learning. Adults can create opportunities for mathematical and scientific exploration by providing open-ended materials and encouraging children to explore and experiment in outdoor play spaces (Pellegrino, 2020). Loose parts are materials that can be used in a variety of ways, such as sticks, rocks, leaves, and sand. Adding loose parts to outdoor play environments allows children to engage in mathematical and scientific thinking. They can sort, classify, and measure these objects, developing skills in numeracy and scientific inquiry.

For example, children can use sticks to build towers, bridges, and houses. They can use rocks to create patterns or to build a rock wall. They can use leaves to create collages or to make a leaf rubbing. They can use sand to make sandcastles or to dig for buried treasure. By

providing children with loose parts, adults can help them to develop a deeper understanding of the world around them (Clements, & Sarama, 2007). Children can learn about the properties of different materials, such as their weight, size, and shape. They can also learn about the concepts of balance, symmetry, and patterns.

In addition to developing mathematical and scientific concepts, loose parts can also help children to develop their creativity, problem-solving skills, and social skills. When children are given the opportunity to play with loose parts, they are free to be creative and to experiment (Whitebread, 2012). They can also learn to work together with others to solve problems and to create something new. A study by the University of Illinois at Urbana-Champaign found that children who played with loose parts in outdoor play environments showed greater gains in mathematical and scientific thinking than children who did not have access to loose parts (Pellegrino, 2020). The study also found that children who played with loose parts were more likely to be engaged in creative play and to interact with their peers in positive ways.

Sensory experiences

Outdoor environments provide rich sensory experiences that can support children's understanding of mathematical and scientific concepts. Adults can encourage children to observe and ask questions about the natural world, fostering curiosity and critical thinking skills (Suggate & Reese, 2012). For example, playing with water, sand, and mud can help children explore concepts of volume, capacity, and texture. Playing with water can help children explore concepts of volume, capacity, and texture. Children can learn about the properties of water, such as its weight, temperature, and how it flows (Malone & Tranter, 2003). They can also learn about the concepts of volume and capacity by measuring how much water they can hold in different containers.

Playing with sand can help children explore concepts of weight, texture, and gravity. Children can learn about the properties of sand, such as its weight, how it feels, and how it moves. They can also learn about the concept of gravity by seeing how sand falls when it is dropped (Neuman & Roskos, 2005). Engaging children in gardening activities allows them to observe and participate in scientific processes such as seed germination, plant growth, and the interdependence of living organisms. It also provides opportunities for measurement, estimation, and data collection (Vygotsky, 1978).

Likewise playing with mud can help children explore concepts of texture, temperature, and viscosity. Children can learn about the properties of mud, such as how it feels, how it sticks to things, and how it flows. They can also learn about the concept of viscosity by seeing how mud moves when it is stirred or poured.

Affordance

It is a term used to describe the possibilities for action that are offered by an object or environment. In the context of early childhood education, affordances can be used to support children's learning by providing them with opportunities to explore and interact with their surroundings (Sarama, & Clements, 2009). For example, a pile of leaves can offer affordances for counting, sorting, and measuring. A tree can offer affordances for climbing, exploring, and building.

One of the key ways to think about affordances is to consider the child's perspective (Pellegrino, 2020). What possibilities for action does the child see in the object or environment? What skills and knowledge does the child need to be able to take advantage of these affordances? For example, a young child may not be able to climb a tree on their own. However, they may be able to climb a tree with the help of an adult. By providing the child with this support, the adult is helping the child to develop the skills and knowledge they need to be able to climb a tree independently in the future (Eick, 2012).

Affordances can also be used to support children's learning across different domains. For example, a pile of leaves can be used to support children's learning in mathematics, science, and literacy. In mathematics, children can count the number of leaves, sort the leaves by color or shape, and measure the length and width of the leaves (English & Halford, 2012). In science, children can observe the different textures and colors of the leaves, and learn about the different types of trees that shed leaves (Gibson, 1979). In literacy, children can use the leaves to create art, write stories, and make up poems. By providing children with opportunities to interact with objects and environments that offer a variety of affordances, adults can help them to develop a deep understanding of the world around them.

Documentation and reflection:

When children are given the opportunity to explore and learn in an outdoor environment, they are often making observations and inquiries (Brooker, 2002). Adults can support children's

learning by documenting these observations and inquiries. This documentation can be in the form of photographs, drawings, or children's explanations. Displaying this documentation can help stimulate further exploration and dialogue. When children see their own work displayed, it can help them to remember what they have learned and to be more motivated to continue learning. It can also help other children to learn from what the first child has learned.

For example, if a child is exploring the concept of volume by measuring how much water can fit in different containers, an adult could document this by taking a photograph of the child measuring the water. The adult could then display the photograph in the classroom. This would help other children to learn about the concept of volume and to see how the first child was measuring the water. In addition to stimulating further exploration and dialogue, documentation can also help adults to track children's progress over time (Wells, 1986). By looking at the documentation, adults can see what children have learned and what they are still learning. This information can be used to plan future learning experiences. According to File, Mueller & Wisneski, (2012), children who had their work documented showed greater gains in mathematical and scientific thinking than children who did not have their work documented. The study also found that children who had their work documented were more likely to be engaged in creative play and to interact with their peers in positive ways.

Ask questions:

Adults can help children to learn about mathematics and science by asking them questions about their observations (Brooker, 2002). For example, if a child is playing with a stick, an adult might ask, "How long is the stick?" or "What shape is the stick?" Adults can also ask questions about the properties of objects. For example, if a child is playing with a ball, an adult might ask, "What does the ball feel like?" or "What happens when you throw the ball?" These questions can help the child to develop their understanding of scientific concepts such as texture and gravity.

Provide resources:

Adults can provide children with books, magazines, and other resources that can help them to learn about mathematics and science. Books like "Math Curse" by Jon Scieszka and Lane Smit and magazines like "National Geographic Kids" can be used to support children's learning both indoors and outdoors. By providing children with these resources, adults can create opportunities for hands-on learning experiences and promote their interest and understanding in mathematics and science.

Conclusion:

In conclusion, adults working with early years children play a crucial role in supporting and encouraging their engagement with mathematical and scientific concepts in outdoor environments. By incorporating principles of play-based learning, providing open-ended materials such as loose parts, and creating sensory experiences, adults can create rich learning opportunities for children. Nature walks, gardening, and observation of the natural world allow children to explore scientific processes and develop critical thinking skills. Additionally, documentation and reflection serve as valuable tools for stimulating further exploration and fostering dialogue. It is through these intentional and supportive interactions that adults can nurture children's curiosity, promote their understanding of mathematical and scientific concepts, and lay a strong foundation for future learning.

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