



Feature 1- Sloping and uneven surfaces

(Hwb, 2020b) states when children play on sloped and uneven surfaces can be used by children to develop scientific and mathematical concepts by, they can create connections and adapt what they have learned to other contexts, such as doing it for real and feeling the forces and fluctuations in energy. Sloping and uneven surfaces are linked to the New Curriculum for Wales 2022 because children can use their knowledge and understanding to predict effects as part of their scientific exploration. For example, they may wonder what will happen if they let go at the top of the slope or how they can test their predictions. Or how can they accelerate their descent down the slope. Environmental practitioners could add balls for the kids to throw down the slope. Children can investigate different forms of energy and how they can be transferred on sloping and uneven surfaces, for example, as they are at the top of the slope, they have potential energy as they slide, kinetic energy as they slide, and sound energy as their trouser rub on the grass, all of which are linked to the new Curriculum for Wales 2022 (Hwb, 2020b).

(Hwb, 2020a) suggest children can explain the effect forces have on themselves and on objects when they slide and roll down sloping and uneven surfaces, which is linked to the new Curriculum for Wales 2022. Children struggle to stop themselves from sliding down the steep hill due to gravity at times, but they slow down as they near the bottom due to friction. They'll inquire as to whether it's simple to climb back up, and if so, why. A toddler may be afraid of sliding down the very steep slope and instead choose to go down a less steep slope nearby. With adult assistance, kids will gain confidence to roll down and will then return to repeat, allowing youngsters to explore and experiment. Children can use sloping and uneven surfaces to acquire certain scientific or mathematical concepts

because it demonstrates interest and asks questions about how things work, and it allows them to explore the world, make observations, and convey their thoughts. It allows children to ask questions and utilise my knowledge to recommend easy techniques of investigation; for example, they can be curious and examine how different forms of sliding affect our speed. They can compare and experiment. After having this time to practise and develop his skills, the child applied them to the steer slope.

Feature 2 – Different patterns and textures of rocks, sand, mud, and leaves

Exploring the diverse patterns and textures of rocks, sand, mud, and leaves can be used by children to develop scientific and mathematical concepts by it allows children to learn about the environment around them as well as what they perceive in the environment. They can learn about the living things in their surroundings. Allows children to investigate the relationships between living things, their habitats, and their life cycles. Children can become excellent people and be nice to other living things by observing a variety of other living beings. When children investigate the many patterns and textures of rocks, sand, dirt, and leaves, they can explore and learn in a fun, engaging, stimulating, and safe setting (Hwb, 2020b).

Using the mud, children can express their creativity, improve their fine motor abilities, and explore literacy, science, and arithmetic skills. Making before-and-after comparisons, investigating solids, solvents, and solutions, examining mixture of different soils, exploring changes to freezing and melting, measuring, trying to investigate volume, practising one-to-one communication, exploring specific question, solving problems, and testing theories are just a few of the opportunities they must practise emergent science and mathematical skills (Hwb, 2020a). The children also tried their hand at cooking, making stuffed mud pies, various soups, birthday cakes, cups of teas, stews, and much more. When children tried new recipes, they frequently wanted to share them with their friends. Recipe cards and pens could be added by the teachers, and which enable children to begin to write recipes. The staff also printed out recipes on big sheets of paper for the children to follow, using pictures and words. The recipes sparked an interest in measuring, with several students debating and discussing the proper method of measurement.

(Hwb, 2020b) believes children discovering diverse patterns and textures of rocks, sand, mud, and leaves, can be used by children to develop scientific and mathematical concepts because they can use their knowledge and skills to predict effects as part of my scientific investigation, such as what happens if I add water to the sand. What is going to happen? Children examining the diverse patterns and textures of rocks, sand, mud, and leaves can explain the effect forces have on themselves and on objects, for example, why do rocks and leaves have distinct patterns and colours? This relates to the New Curriculum for Wales 2022 (Hwb, 2020a).

Feature 3 – Plants and animal life

(Hwb, 2020b) suggest developing children's fine and motor skills through inquiry and curiosity, children can use plants and animal life to build scientific and mathematical concepts. For example, children will be bending down, balancing, and picking up little living things. Children can use exploring plants and animal life to improve scientific and mathematical concepts because they can recognise that plants and animals are living things that grow, which aligns with the new curriculum for Wales 2022. Children can use plant and animal life to acquire scientific and mathematical concepts by recognising that what they can accomplish and the things they can use influence their surroundings and the living creatures around them. Children can use plants and animal life to develop scientific and mathematical concepts by allowing them to investigate relationships between living things, their habitats, and their life cycles, which corresponds with the New Curriculum for Wales.

(Hwb, 2020a) says practitioners could include magnifying glasses and pictures of various animals to encourage children to explore, make observations, and communicate their ideas in the environment, allowing them to become independent explorers. This ties in with the Science and Technology area of the New Curriculum for Wales. (Hwb, 2020b) sates practitioners could also give children pens and paper and instruct them to investigate, collect, and record data found in their environment; for example, the children could count how many of each plant or animal they find, which connects the mathematics and numeracy areas of the New Curriculum for Wales.

RISK BENEFIT ASSESSMENT

Location / Activity:	Garden	Date:	1 st March 2022
Assessor:	Victoria Alonzi	Review date:	1 st October 2022

ACTIVITY	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
Exploring things that children see, for example sand, rocks, mud, insects, and mini bugs.	Gives children the opportunity to learn about the environment around them and what things they see in the environment. Children are given the opportunity to learn about living things in the environment around them. Gives children the opportunity to explore the connections between living creatures, their habitats, and life cycles. Help develop children's physical development, for example stretching, bending, as well as other gross and fine motor skills. Being observant to many other living creatures and becoming a good person and being nice to other living things.	When exploring things that children see, there are a variety of hazards and risks which may occur to children, for example bites and stings from insects. Children can be allergic to insect. Poisonous or irritant plants, for example stinging nettles and blackthorn. Children might collect inappropriate material, for example rubbish.	Children and the adults.	Talk to the children about things that they come across which may be unexpected and interesting to them. Make sure children know their boundaries, for example be aware of where they are not allowed to go without an adult or making sure children are aware of things they should not collect, for example rubbish. Rules in places, for example when outdoor play is over, they must wash their hands and they must not put anything in their mouths.	L

ACTIVITY	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
Children playing on uneven ground.	Supporting children with their sensorimotor sense, for example balance. Gives children the opportunity to become more apparent to hills and slopes. Helps children with the knowledge of energy and movements. Children can become more knowledgeable of their bodies and what they are capable of. Gives children the opportunity to learn about the different outdoor surfaces, for example mud, grass, sands, and stones. It gives children the opportunity to learn about the outdoor environment around them and what is in the outdoor environment.	When children are playing on uneven ground, there are a range of hazards and risks which can happen to children, for example children might fall or trip which may cause children to bruise or cut themselves or sprains a body part or other injury may occur.	Children and the adults.	Talk about the different surfaces with the children. Since the surfaces may be unfamiliar to them, the children might begin by walking slowly until they feel comfortable with the surface. Children must wear appropriate clothing and shoes, for example wearing wellies and long trousers to reduce risk. Adults can play fun balancing games with the children to help support their balancing sense. Show children how to walk on the surface before they try to walk on it. When outdoor play is over, the children should go and wash their hands first and they must never put anything in their mouths when in the outdoor environment.	L

ACTIVITY	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
Outdoor play in a range of weather conditions	Gives children the opportunity to be mindful of weathers and temperatures, for example, wet, dry, windy, hot, and cold. Gives children the opportunity to recognise potentially harmful objects in the environment and take steps to minimise the risks to themselves and others. Children can recognise the importance of risk management and self-care. Give children the opportunity to learn about the different seasons and weathers.	When playing outdoors in a range of weather conditions, there are a range of hazards and risks which can happen, for example, high winds which causes branches to fall which may cause head injuries. Children may become too hot or cold. If children get wet, they may become distressed and uncomfortable and want to go inside and change. Children may get too much sun which may cause heat stroke or children become sun burnt.	Children and the adults.	Adults would look at the weather Met Office to look at the weather, if winds are over 30mph speeds or in stormy weather, children would not go outside. Children should wear appropriate clothing in hot and sunny weather, for example, hats, sun cream, water available for children and shelter to shade the children from the sun. Children should wear appropriate clothing in cold, windy, and rainy weather, for example warm layers, wellies, and waterproof clothing.	L

ACTIVITY	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
Exploring independently in the environment around them.	Gives children the opportunity to investigate their surroundings, make observations and express their thoughts. Gives children the opportunity to learn about the environment around them. Children are given the opportunity to recognise potentially dangerous objects in the environment and take steps to minimise the risks to themselves and others around them. Gives children the opportunity to get knowledge and understanding of the world around them. Gives children the opportunity to become independent in the outdoor environment.	When exploring independently in the environment around them, there are a few of hazards and risks which may happen, for example children may wonder off and go missing. Children may collect inappropriate material, for example rubbish. When exploring independently in the environment, children may fall or trip which may cause children to bruise or cut themselves The children may come across broken object which they may hurt themselves, for example cut themselves.	Children and the adults.	Make sure children know their boundaries, for example they are only allowed in certain places on their own and they should be aware of where they are not allowed to go without an adult. Adults having talks with the children to make sure that the children are aware of things they should collect, for example rubbish or dangerous objects. Putting rules in places for the children to follow, for example when outdoor play is over and it is time to go back inside, the children must go and wash their hands straight away and they must not put anything from the outdoor environment in their mouths. Talking to the children about the environment around them and teaching them about the different risk which may happen within the environment.	L

Jean Piaget (cited in Sherrel, 2021) believes children are ‘little scientists’ who learn from experimenting in their environment while playing. Piaget says that children achieve this on their own, without the help of adults. He suggests that children learn through memory, language, and reasoning at different times in their development. Furthermore (Gallenstein, 2005) states that providing children with an engaging environment, allows them to be curious and discover through active learning helps them to improve scientific and mathematics skills.

Moreover (Rahardjo, 2019, p. 2) suggest that these experiences can be had outdoors, in places like woodlands, gardens, fields and parks, which are active and provide the kinds of open-ended resources

that inspire children and young people to use their imaginations and them being engaged in creative thinking while also supporting mathematical and science thinking.

Similarly (Beate, 2019) suggest that adults play an essential part in ensuring that children have access to the outdoor and to surroundings with high play affordance, where they can use the materials and landscapes in a range of inventive ways. Children's engineering and creative thinking skills are developed in the outdoor environments with a range of loose parts or variables, that are open ended, transportable resources that encourage problem solving by allowing children to construct combine, and develop new things from different materials, according to Nicholson's (1971) loose parts theory. Adults need to create an enabling outdoor environment for children with access loose parts, for example ricks, leaves, stones, or manmade loose parts, for example rope, wood, tyres and guttering so that children and young people can recognise complex ideas such as length, volume, weight, friction, gravity, and material properties in real ways through play, according to Nicholson.

Children, according to Nicholson (1971), need space and time to return this form of experimental play to solidify their learning. According to Nicholson (1971), children love participating in the design process. This includes investigating the nature of the problem, considering their requirements and needs, and considering planning alternatives, as well as measuring, model-making, drawing, and mathematics, as well as construction and building, as well as experimentation, modification, evaluation, and destruction. Once started, the process of community engagement never ends.

However, Nicholson (1971) and Casey (2017) states that such opportunities to play with loose parts are restricted stating factors such as adults failing to see the benefits of open-ended outdoor play in formal learning.

Furthermore (Tovey, 2012) states the garden was at the heart of Froebel's concept of a 'kindergarten.' It was a place where children could grow and learn at their individual speed, surrounded by adults who nurtured their learning in the same way that skilled gardeners do with young plants. Children, according to Froebel, are active, inquiring, and also are creative learners. Self-activity, rich first-hand experience, problem-solving, play, and talk, he believed, were the best ways for children and young people to learn. (Tovey, 2020) suggests that they flourish in environments where they are emotionally safe, joyous, and have deep relationships with others. Froebel believed that the garden provided a perfect environment for young children. Children gain an awareness of the natural world, begin to enjoy its beauty, and learn to care for it through gardening, exploration, and outdoor play.

Therefore, according to (Tovey, 2020) believes if children are given the opportunity to see the effects of the changing seasons on the garden, they will learn about the rhythm of nature. Giving children the opportunity to plant directly and meaningfully helped them comprehend the cycles of life and death, development, and decay. Children can have rich, sensory first-hand experience in the outdoors,

which is essential for their developing minds. Engagement with the natural world's awe and mystery. Allows them to try things out, experiment, explore, and learn more about how the world around them works. Key concepts like as gradient, speed, energy, and gravity, as well as life and death, are explored. Allows kids to experience adventure, risk, and challenge.

According to (Tovey, 2012), outdoor play engages children's curiosity, imagination, and creativity while also promoting the children's health and well-being and encouraging them to ask questions. Children have actual, direct experience of the natural world through outdoor play. They learn not simply about nature, but also about themselves in nature. (Tovey, 2020) say they learn about the changing seasons, the cycles of life and death, and development and decay through activities, such as planting potatoes, harvesting apples, and baking bird cake. Adults can provide additional experiences to help children's inquiries, such as building a wormery to observe worm tunnels or investigating how temperature converts water into ice.

Simple, open-ended materials, according to Froebel, children in expressing their thoughts, feelings, and experiences. (Tovey, 2012) states that they enable children to delve into various areas of meaning. These were dubbed 'forms of knowledge,' 'forms of beauty' and 'forms of existence' by Froebel. As a result, any one representation may include elements of knowledge as an example scientific or mathematical understanding, personal experiences, and aesthetic elements such as pattern, shape, or symmetry. (Tovey , 2020) suggests children's gardens for growing flowers, vegetables fruit, and herbs, as well as digging spaces for exploring and discovering, are available in some settings. Grassy banks for clambering and rolling, ditches for crossing, and slopes for sliding, are all examples of uneven ground that children can navigate. Rocks and long grass are examples of wild places that can provide opportunities for exploration, adventure, imagination.

Furthermore (Tovey, 2012) suggests children should be able to move their bodies in space through a variety of movement activities such as sliding, swinging, running, balancing, climbing, and crawling. A well-designed environment can give an spatial sensations like over, though, under, and in between, as well as exposure to concepts like height, gradient, speed, energy, and gravity. Sliding down a slide headfirst, for example, provides experience with direction, speed, gradient, and the notions of headfirst or even head-first backwards.

Moreover (Tovey, 2020), says 'open-ended materials are those that have no specific purpose and can be used in a variety of ways. Boxes, wheels, pipes, guttering, crates, , planks, and ropes are just a few examples. Such adaptable, transformable resources open a world of possibilities for problem solving and creative, inventive thinking. They'll have places to hide, places so children can build dens, and construct their own private worlds. All children, according to Froebel, require an area in which they can establish their own miniature world or 'kingdom,' which is best chosen and created by them. Uninterrupted time allows for participation and engagement.

Froebel (cited in Tovey, 2012) understood the importance of outdoor adventure play. Rather than focusing on the hazards, Froebel believes that practitioners should think of the advantages of such demanding endeavours. Climbing trees, for example, enables children with experiences of height, perspective, and distance, as well as feelings of delight and accomplishment. He said that children who are exposed to rising levels of difficulty in their play are safer than those who are shielded from them. The child who is unaware of his own power and the demands placed on it is more likely to go beyond his experience and face unexpected peril. Froebelian emphasise the importance of observing to take note of what children are thinking about, interested in and feeling rather than ticking off stages of growth or isolated successes. Observation requires attentive attention, openness, and a desire to learn more.

Therefore, according to the Gibson 1966 Affordance theory (cited in Early Years Education, 2016), the outdoor environment is perceived not only in terms of objects shapes and spatial relationships, however also in terms of objects opportunity for action which is affordances. Perception leads to movement. Play affordance is lively and all about having a good time. Active detections or sensing and acting at the same time leads to affordance. By stacking, mouthing and hurling bricks, a child investigates their utility.

Gibson 1966 Affordance theory (cited in Early Years Education, 2016), says children are opportunists that seek out play chances through intense interaction with the environment around them. An example of affordance is children saying can they climb up slide. Children having access to rich affordance can be improved by providing loose parts, preserving the play environment, watching children, and adding schematic interests to inform planning. Sticks, twigs, feathers, and dirt are examples of exploitable flexible items. Simply allowing children to touch these items is insufficient; Children should be able to manipulate, construct, transfer and modify them.

Similarly, adults can support and encourage children to have opportunity to engage with mathematical and scientific concepts in the outdoor environment by allowing children the opportunities to be creative, to be noisy to move around and to take risks, according to (Ernst, 2012). (Clement, 2013) suggests that children who take risks build their resilience which helps the children to deal with stress. Being able to exposure to the outdoor environment enhances children's own investigations. They can experience nature at first hand, for example how plants and animals react to the different seasons and how the weather changes. The outdoors is full of special stimuli such as weather, smells, and textures, sounds and which can enrich and enhance children's learning environment.

According to (Beate, 2010, p. 437), adults can support and encourage children to have opportunity to engage with mathematical and scientific concepts in the outdoor environment by children being given the opportunity to be outdoor helps them to problem solving which can relate to real experiences for example, how to move logs from one area to another. The outdoor environment is very well suited to meeting children's needs for all types of play and building upon first-hand experiences. Children can experience aspects as an example, sustainability and conservation at first hand and develop a love of nature.

Moreover, (Martininsen, 2010, p. 458) states that adults can support and encourage children to have opportunity to engage with mathematical and scientific concepts in the outdoor environment by allowing children to go outdoor and use this outside space which allows and encourages children to relive their experiences through their most natural channel, for example movement. The outdoor play environment is important for children's brain development because the more children can explore and question and experience, the more connections will be made in their brains and the more they will develop as capable learners.

Therefore, according to (Gill, 2010), adults can support and encourage children to have opportunity to engage with mathematical and scientific concepts in the outdoor environment by allowing the children to go out in the outdoor environment to experiment physically, providing them opportunity to build self-confidence and encouraging them to find out what their bodies are capable of and how to take calculated risks, for example climbing, jumping, running, slow, fast, balancing It enables the development of gross and fine motor skill. Children can learn important skills through play, for example, sharing and working with others.

(Eager, 2010, p. 500) suggest that adults can support and encourage children to have opportunity to engage with mathematical and scientific concepts in the outdoor environment by allowing children to use the environment as they wish within any boundaries, for example not telling the children that they can not climb up the tree or they can not jump in the water or they are not allowed to go off on their own to do their own investigation. Observing and adapting. Reflecting on what children engage with Mathematics is important in the outdoor environment as it encourages children and young people to explore, estimate, and solve real-life problems in the environments. Adults should give children the opportunity to lead their own play and to observe them, rather than trying to take over and tell the children what to do.

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Lev Vygotsky (cited in levykh, 2008, p. 85), came up with the zone of proximal development. The zone of proximal development focuses on the shaded part which is what a child can do with help. When a child is doing an activity ask them questions to extend their leaning further. Current practice influences children by giving a child who is low ability one to one support or giving them extra help.

The New Curriculum 2022 Mathematics and Numeracy in Wales (Hwb, 2020b) emphasises the importance of outdoor play in the development of mathematics and numeracy, allowing children to solve problems, explore ideas, discover connections, and cooperate with those around. Learners need opportunity to work independently and collaboratively in later years to build on the foundations laid in the early years. In Wales, The New Curriculum 2022 Science and Technology (Hwb, 2020a) emphasises the requirements for all learners being given the opportunity to be able to critically evaluate inputs, understand the basis of information given as reality, and make informed decisions that affect their own behaviours and values. They should improve their capacity to ask the questions in a relevant way.

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