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Section 1- Photograph.

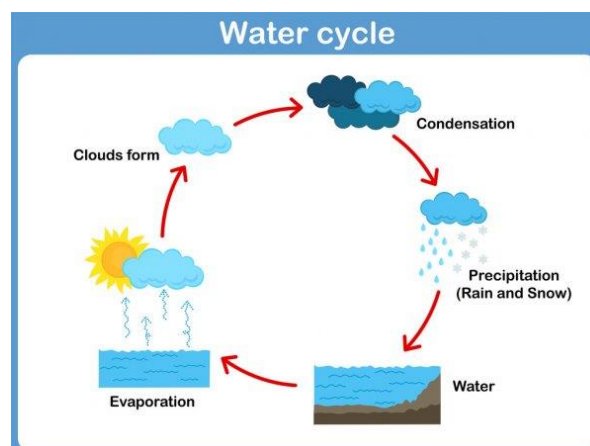


This image is to show a clearer picture of the stream within the outdoor area that can not be seen clearly within the first picture.

Section 2- Three key features.

I have chosen three features within my photograph that are areas of an outdoor space than can be used to develop specific concepts of mathematics and science within a child's development.

The first feature I have chosen is the stream as there are many concepts of mathematics and science that can be discussed and explored with children within this area. Loose parts can either be added to the area beforehand or children can explore and find loose parts in the natural area such as sticks, stones or rocks and pinecones, sinking and floating can then be explored by the children when placing different loose parts into the stream, this could then lead on to discussions about weight and whether loose parts float or sink because of them being heavy or light. Welsh Government (2015) explain within the Foundation Phase outcomes children should be able to directly compare weight or mass when discussing lighter and heavier and also states within mathematical development children should be competent in recording collections by either using marks, numbers or patterns, the activity can support this by asking children to keep a record of which loose parts float or sink. As well as the floating and sinking activity, children may also be curious as to where the water in the stream is coming from, conversations of the water cycle can then take place leading on to weather patterns such as where do puddles go when it is a sunny day? And how that cycle then becomes the rain that fills the streams and rivers.



(Source: Depositphotos, 2021).

The second feature I have chosen are the trees within the photograph. Climbing trees will not only further a child's physical development but also give opportunities for questions and discussions. By climbing to different branches children can analyse whether they are higher or lower than their peers and can also be given different tools to measure how high they have climbed. Gravity can also be considered when climbing trees as children may notice it is much harder to climb up the branches of the tree than it is to jump down. Shape, size and pattern can also be discussed when looking at the different trees in the area, rubbings can be taken of the leaves to examine the different patterns on them and to keep as a record to compare with other leaves they may find, this can also be done with the markings of the bark on the tree. This activity also links to the Foundation Phase (2015) knowledge and understanding outcome which explains opportunities should be available for children to recognise natural features for example, hills and streams and investigate how places change such as leaves may be bright and green during summer months but when returning later in the year to do the same activity the leaves may be crisp and brown. The children can also collect leaves and compare the different shapes as well as the sizes and can take measurements either using measuring tools or comparing them to things such as a leaf being the same size as their hand or the length of their foot, this can also be done with sticks and twigs as length and weight can be discussed when collecting them.

It is not only the bark, sticks and leaves on the trees that can be used to develop mathematical and scientific concepts, light and dark as well as shadows can also be discussed. As seen in the photograph, the area where the stream is, is very dark and shaded even on a sunny day as the wider part of the stream is surrounded by large trees, this may prompt children to question how the trees are creating the shaded areas and shadows and how that is being caused by the trees blocking the light from the sun. Another scientific concept that can be considered when exploring the trees are the life cycle of animals and bugs that may live in or on the trees and need them to survive, to give an example of this children may discuss how wildlife that live in the trees and feed off of them help to disperse the seeds for more trees to grow which is beneficial to the environment. Children may also research how trees take in the carbon dioxide from the air and turn it in to oxygen, this is also beneficial to the environment as it is playing a part in preventing air pollution and is linked to Donaldson's New Curriculum in Wales who states children will be citizens who are ethically informed to

showing commitment towards the sustainability of the planet (Welsh Government, 2015), Foundation Phase (2015) also explains children should recognise that the actions carried out by humans can have either a positive or negative impact on the environment.

The third feature I have chosen from my picture is the hill that is sloping down from the trees. There are a number of mathematical and scientific concepts that can be explored in this area. The hill can be measured to find out whether it is long or short, children can lay length ways down the hill to see if they are the same length as the hill or longer or shorter, children may also use objects such as tape measures to measure the hill or loose parts such as sticks or rope to find out the length. Height can also be discussed; children can stand at the top of the hill and analyse whether they are much higher than those at the bottom of the hill or whether it is a hill that is not that steep. Children can also use loose parts that have either been previously added or that they have found to roll up or down the hill, by doing this the concept of gravity can be introduced to the children as the children may notice how quickly items roll down the hill however if not enough effort is putting in to rolling an object up the hill it will roll back down towards them.

Section 3- Risk Benefit Assessment.

RISK BENEFIT ASSESSMENT

Location / Activity:	Field/ Stream	Date:	September 2021
Assessor:	Molly Scanlan	Review date:	March 2021

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.

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Being at the edge or in the stream.	Children will learn about the water cycle as well as why objects float and sink. They will also learn about forces such as when they jump in the water how high it splashes up in the air. children will also learn how to be safe around water while being at the stream.	Slipping either on the stream surface or edge of the stream where the ground has become wet. Tripping or falling on objects such as sticks or rocks that may be on the bed of the stream. Bacteria in the water from wildlife that may be passing through the stream.	Adults and children.	Adults explain the hazards of being in the water or slipping while on the edge of the stream. Encouraging children to walk carefully when at the edge of the stream and to pay attention to what may be under the water such as loose rocks that may cause trips and falls. Ensure adults and children wear appropriate footwear. Adults to explain to children the water is not safe to drink and to take appropriate hand washing equipment that can be used when the children have finished the activity.	M

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Climbing trees.	Physical development will be supported while children are climbing trees. Mathematical and scientific development is supported during conversations children have while climbing trees.	Children may slip while climbing up the tree or coming back down, they could also fall from a branch while in the tree. Children may climb too high and be unable to independently get back down. Children may get cuts or scrapes from sharp branches that may be sticking out.	Children, adults if they climb as well or have to climb to help a child.	Explain to children before they climb the tree that they must not climb higher than they are able to and need to be able to get back down. Ensure appropriate footwear and clothing is worn to try and prevent slips and cuts or grazes. Ensure appropriate first aid is to hand in case of cuts, scrapes, grazes or falls.	L
Collecting natural loose parts.	Children are able to gather natural objects, exploring the different texture, sizes and shapes as well as learning about where they come from and how they are used by other wildlife such as for food and resources for nests and dens.	Collecting items that may be poisonous, cause allergic reaction or stings. Children may eat items that look like fruits or sweets. Children may also collect parts that they do not realise are part of an animals nest.	Children and adults.	Adults to ensure it is explained to children before collecting loose parts that not all of the natural objects they find may be safe for them to touch and that children should definitely not eat anything they find and if they think it is fruit, they should check with an adult first. Adults should be aware of any allergy's children may have and carry a first aid kit containing medicines or creams they may need for reactions. Adults should also talk to children about animals may have nests or dens that they have spent time building and although these things are interesting to see children must not disturb them.	L

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Exploring shadows and shaded areas around the trees.	Children will learn how objects blocking the light of the sun creates shadows or areas that are in the shade. They may also discover other ways to create shade or shadows by using other objects.	Tripping on uneven surfaces in shaded areas or roots of the tree when underneath it.	Adults and children.	Adults and children to wear appropriate footwear for walking on uneven surfaces,	L
Collecting leaves, sticks and bark from the trees.	Children will be able to explore different shapes and sizes of leaves, textures and patterns of bark and sticks. They will also be able to discover different leaves come from different trees and not all are the same shape and size.	Children may collect leaves that are poisonous or cause stings, rough or sharp edges on the bark or sharp sticks could cause cuts or scrapes. Leaves. Sticks, or bark found on the floor may be contaminated by animals in the natural area.	Children.	Adults can talk about how to recognise leaves that may cause stings, gardening gloves could also be used to prevent children from cutting or scraping their hands when collecting or exploring the natural objects. Appropriate hand washing equipment should also be available for the children to wash their hands when they have finished the activity. A first aid kit should also be to hand.	L

ACTIVITY	How will young people BENEFIT from this activity?	Possible hazards	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk RATING: L/M/H
Exploring animals or bugs that live in or on the trees and in that natural environment.	Children will learn how animals rely on nature to survive as well as the life cycle of the animals or bugs that live there. Children will also be able to discuss the different types of animals and bugs that live in the same natural area.	Children may unknowingly disturb nests such as wasps, ants or even birds that are protecting their young. There is also the possibility of stings or insect bites as well as the possibility of touching animal waste.	Children and adults.	It should be discussed with children before exploring the animals and insects in the area that if they feel threatened there is the possibility of insects stinging or biting as well as other animals such as birds may have babies that they feel they need to protect when human beings are close by. Adults should be aware of any allergies children may have for example an allergy to bee stings and carry the appropriate medicines, creams or first aid equipment.	L
Rolling loose parts down the hill.	Children will learn how different objects may roll better depending on their shape, size and weight.	Loose parts rolling down the hill may bump into children or adults at the bottom of the hill or walking up.	Children and adults.	Rules should be set out on how and when loose parts get rolled down the hill, for example, children are to shout when a loose part is about to be rolled down the hill.	L

Section 4- The role of the adult.

All children have the right to experience being outdoors and enjoy their time there according to White (No date), she discusses by allowing children free access to the outdoors young children are able to develop not only their bodies but also their minds and are given the opportunity to thrive by learning through real experiences and play that is stimulating. White (No date) also explains to unlock the full potential of the outdoors it is crucial to have adults that are knowledgeable and enthusiastic about being in the outdoors to provide a rich outdoor experience with a variety of stimuli offering real experiences with context for play and exploration. She goes on to say children should experience awe, wonder and joy by being outdoors and develop skills to care for the environment and the living things within it and be curious and fascinated by these experiences.

Bilton (2010) discusses similar statements to White, she explains the outdoor environment should be available to children to explore and be creative learners everyday no matter what the weather, she describes the outdoor area as a 'complete learning environment' offering experiences for all developmental needs of children and is a space where children feel most at ease and capable with their learning.

Bruce, Louis and McCall (2015) explain by keeping records, those working with children are able to provide the best opportunities for each individual child or group of children and get to know how to support each child's development by recognising what opportunities should be offered to the child or children next. They suggest by observing spontaneous play adults will be able to produce planning suited to the interests of the child.

Montessori emphasised how social aspects rather than the curriculum are important for a child's development (Aubrey and Riley, 2020). As well as these important factors she also stated the environment should be structured in a way that offers freedom to the children to choose their own activity and resources to further their learning, developing children into confident and independent decision makers who are able to take responsibility for their own learning. This is supported by Donaldson (2015) in the new curriculum for Wales stating children will become confident and healthy individuals who can make appropriate decisions about their lifestyle and managing risk. Piaget also believed a child's learning was generated by their

interactions with their environment and that their learning would be driven by their curiosity of the world (Aubrey and Riley, 2019). They go on to state children should be offered an environment that is full of curiosity and challenge and that those working with children should facilitate appropriate learning experiences as well as supporting children to find solutions to problems they may come across.

Montessori and Piaget both state to support cognitive development children should learn through first hand experiences and that play is the vehicle for children to construct this knowledge through a supportive learning environment offering free exploration. However, Piaget believes children's play should be creative and offer opportunity for exploration and states Montessori's theory lacks this and is not open ended enough (Aubrey and Riley, 2019).

Piaget describes children using his most famous metaphor referring to children as little scientists who think differently and are cognitively different to adults and experiment and explore the world around them, however Piaget's view contrasts with the metaphor used by Vygotsky who describes children as little apprentices (Olley, no date). Pluck and Johnson (2011) discuss how Vygotsky suggests that through offering stimulation and exploration through childhood curiosity a child's cognitive abilities can be developed.

PlayScotland (no date) supports this statement explaining Nicholson recognised the need for children to build and make things and to play with objects that satisfy the curiosity of the child. Nicholson (2009) explains that any environment has a degree of inventiveness and that the possibility of discovery and creativity are equal to the amount and type of variables within that environment. He goes on to describe there is evidence that all children have the desire to interact with loose parts by playing, experiments, discovering and having fun with them, some of these variables may be fluids, plants, materials, shapes and natural objects.

These loose parts can be used in a number of ways to explore concepts of maths and science, Ranheim (2020) discusses her findings that provoking a child's interest in mathematics is made easier by offering loose parts. She goes on to explain loose parts can be found in any natural environment and can be collected to be used in activities such as classifying, counting and sorting to support mathematical development as well as items such as rocks being used to compare weight and size. Ranheim (2020) also states by encouraging children to be explorers in their natural environment gives them stronger connections with the outdoor world, these

explorations with the outdoor world can also support a child's development of scientific concepts. Gibson (1979), discussed in PlayScotland (no date) suggests how objects that children may find or collect from their environment may be perceived differently by each individual, the affordance of the object can have different potential and offer different opportunities depending on the individual who has found and is using that object.

Daly and Beloglovsky (2014) discuss the benefits of natural loose parts for children to use compared to toys that have a single use, they suggest once children have accomplished the main function of a toy they will simply move on from it, for example putting shapes into holes that are made for that shape, whereas the variability of a stick as a play object for children will offer endless opportunities for example it may be a sword, a magic wand or a fishing pole. Williams (2021) supports this and explains how loose part play can support children's development of problem solving, for example, objects may be too long or short, too big or small, too heavy or too light as well as supporting mathematical development by creating shapes and patterns, noticing size differences and supporting scientific concepts such as how dropping a heavy stone in a container may make the water overflow yet a lighter stone may not give the same outcome, although Williams (2021) also discusses risks associated to loose parts play, although he explains they are not risks that need to be extremely worried about as high risk he still states adults observing loose parts play need to be vigilant. He explains how sticks can very quickly become swords for example and although it may be by accident injuries can still happen, another example is the risk of children putting small loose parts in their mouth, loose parts play can support young children's imagination and creative development, however young children often explore objects with their mouth, therefore, Williams (2021) discusses the possibility of children choking on small items such as conkers or stones used in loose parts play.

The Welsh Government (2015) discusses in its Foundation Phase outcomes for mathematical development children can support their mathematical development through play and this can be done by using loose parts to support children with being able to count items, recognise patterns and shapes, understand more than or less than and finding objects that are bigger or smaller. They also discuss how learning through play can support a child's development of scientific concepts by exploring objects and materials they find within their natural environment and asking questions

about these things they find, furthermore, children will begin to identify how things work and do not work by carrying out investigations in their play as well as figuring out that people's actions and the decisions they make have an impact on the living creatures and environment we live in. The new curriculum for Wales (2015) supports the Foundation Phase outcomes by stating children will be capable and ambitious in using number effectively, enjoying problem solving and understanding how to apply mathematical concepts and be able to explain the concepts they are investigating and learning about.

Gove (2014) explains how children in the UK are now spending less time in the outdoor environment during school hours than previous generations, they go on to discuss how learning science in the outdoor environment can offer a wider range of opportunities for activities that offer scientific concepts, for example learning how water moves with forces and energy can be shown by dropping loose parts into containers of water and seeing how the water moves when that happens and then carrying out the activity on a larger scales with children jumping into puddles or pools of water.

Froebel viewed children as curious, active and creative learners who learned best through first hand experiences. He argued a child's interactions with the natural environment are crucial as well as a quality environment (Tovey, no date), Froebel discusses many benefits of learning in the outdoors to develop mathematical and scientific concepts such as being able to explore how things work and investigate as there is more space to allow for this, engage with the world and explore its wonder and mystery, explore concepts such as gravity, gradient, speed and energy and to also have the opportunity to take part in activities that offer the children risk and challenge.

As seen throughout this portfolio children's development of mathematical and scientific concepts can be supported through all areas of learning and development and support and observations from the adults working with those children can further the child's imagination, creativity and development for them to further their knowledge independently.

Reference List.

Aubrey, K. and Riley, A. (2019) *Understanding and using educational theories*, 2nd Edition, London: Sage Publications.

Bilton, H. (2010) *Outdoor learning in the early years*, 3rd Edition, London: Routledge.

Bruce, T. (2011) *Learning through play*, 2nd Edition, London: Hodder Education.

Bruce, T. Louis, S. and McCall, G. (2015) *Observing young children*, London: Sage Publications.

Daly, L. and Beloglovsky, M. (2014) *Loose parts inspiring play in young children*, Minnesota: Redleaf Press.

Depositphotos (No date) *Water Cycle*, Available at: [13,576 Water cycle Vector Images, Water cycle Illustrations | Depositphotos](#) (Accessed: 11th September 2021).

Gove, M. (2014) *Teaching science outside the classroom*, Available at: [Pages from Cutting and Kelly Final Proof.pdf \(sagepub.com\)](#) (Accessed: 24th September 2021).

Nicholson, S. (2009) 'Landscape architecture', *Nicholson: How not to cheat children*, 62, pp. 30-34, Available at: [Imagination-Playground-Theory-of-Loose-Parts-Simon-Nicholson.pdf \(kaboom.org\)](#) (Accessed: 22nd September 2021).

Olley, L. (No date) *Piagets model of cognitive development*, Available at: [Piaget's Model of Cognitive Development \(massey.ac.nz\)](#) (Accessed: 23rd September 2021).

PlayScotland (No date) *Loose parts play*, Available at: [1-Loose-Parts-Play.pdf \(playscotland.org\)](#) (Accessed: 22nd September 2021).

Pluck, G. and Johnson, H. (2011) 'GESJ: Education science and psychology', *Stimulating curiosity to enhance learning*, 2(19) pp. 24-29, Available at: [Pluck and Johnson 2011 Curiosity-libre.pdf \(nemanet.org\)](#) (Accessed: 23rd September 2021).

Ranheim, D. (2020) *Maths play with loose parts*, Available at: [Take maths play outdoors with loose parts \(communityplaythings.co.uk\)](#) (Accessed: 23rd September 2021).

Tovey, H. (No date) *Outdoor play and exploration*, Available at: [Layout 1 \(froebel.org.uk\)](#) (Accessed: 24th September 2021).

Welsh Government (2015) *Foundation Phase Framework*, Available at: [foundation-phase-framework-revised-2015.pdf \(gov.wales\)](#) (Accessed: 10th September 2021).

Welsh Government (2015) *The four purposes of the curriculum for Wales*, Available at: [the-four-purposes-of-the-curriculum-for-wales.pdf \(gov.wales\)](#) (Accessed: 10th September 2021).

White, J. (No date) *Early years outdoors visions and values for outdoor play*, Available at: [ltl-vision-and-values-web.pdf](#) (Accessed: 23rd September 2021).

Williams, M. (2021) *14 benefits of loose parts play with examples*, Available at: [14 Benefits Of Loose Parts Play With Examples – Early Impact Learning](#) (Accessed: 25th September 2021).

Williams, M. (2021) *Risk in loose parts play*, Available at: [Risk In Loose Parts Play \(And How To Assess It\) – Early Impact Learning](#) (Accessed: 25th September 2021).