

1503540

ECEY5005

Word count: 3619

Section 1



(Parker,2020)

Section 2

Feature one

Trees and ecosystems

The children will have the opportunity to explore their local environment. As you can see from the picture, the location that has been chosen provides a wealth of opportunities for studying different habitats and ecosystems. The children will be given a survey sheet and a magnifying glass.

They will need to go on an animal hunt to see what kind of creatures they can find. They can record this on their survey sheet by keeping a tally of the different creatures. Once the children have conducted their data collection, they can look at the figures and try to work out a food chain for the creatures they have spotted in one area. They will also be asked to think about why the creatures have chosen these areas to live, what is unique about the type of habitat. These activities will cover many of the key scientific and mathematical skills addressed in the New Curriculum. In terms of science the children will be learning about the Statement of What Matters “The world around us is full of living things which depend on each other for survival”. The documents states that:

“By recognising the diversity of living things and how they interact with their environment, learners can develop an understanding of how these have evolved over significant periods of time. All living things require specific conditions and resources to survive and they may have to compete with other organisms to do so. Humans form part of the living world and our decisions and actions, along with natural selection, can have a significant impact on the diversity of life. Knowing about the structures and functions of living things enables learners to understand how these things grow, develop and reproduce successfully. Developing an understanding of the factors which affect the health and success of organisms allows us to make informed decisions, including about the prevention and treatments of diseases.”

With regard to mathematical development the activity will address the Statement of What Matters ‘Statistics represent data, probability models chance, and both support informed inferences and decisions.’ The New Curriculum for Wales states:

“Statistics is the practice of collecting, manipulating and analysing data, allowing representation and generalisation of information. Probability is the mathematical study of chance, enabling predictions of the likelihood of events occurring. Statistics and probability rely on the application and manipulation of number and algebra.” (Curriculum for Wales,2021)

Managing data and representing information effectively provide learners with the means to test hypotheses, draw conclusions and make predictions. The process of reasoning with statistics and probability, and evaluating their reliability, develops critical thinking and analytical skills that are fundamental to enabling learners to make ethical and informed decisions.” (Curriculum for Wales,2021).

Feature 2

Stream and raft race

The second feature that will be used to help children learn and develop scientific competencies will be carried out in the stream located and the edge of the pond. The children will have the opportunity to create their own raft using natural materials that they have scavenged from the surrounding area. Once they have made their rafts the children will use them to take part in the second activity, which is a raft race. First the children will need to see if their raft sinks or floats, this will prompt a discussion on the materials that the different groups have used. Following this the children will use their rafts to take part in a race. They will measure how far their raft travel and how long it takes for their rafts to reach certain points on the pond. In order to complete these tasks, the children will be using and developing a range of mathematical proficiencies. The children will develop their conceptual understanding. They will be asked to explain their raft design and why they have chosen the selected materials. The children will be developing their logical reasoning skills when physically constructing their raft to ensure it is accurate to their design and that the materials chosen were chosen logically, for example, using lightweight materials will keep the raft afloat. The children will also develop their strategic competence when considering what might need to be changed to ensure their raft will float and what might hinder the raft's effectiveness before placing it in the water. The children will also gain knowledge and understanding of forces when seeing their raft be pushed by the current of the water caused by the stream. These proficiencies will also help children develop integral skills such as critical thinking and problem solving, planning and organising, creativity and innovation which have all been given importance in the new curriculum for Wales (Curriculum for Wales 2021). The children will develop skills like critical thinking and problem solving when designing their raft. They will have to consider any possible flaws in their design also when it comes to gathering the materials children will have to use the natural resources around them which may have an impact on their design due to the materials available. The children will also have the chance to develop their creativity skills which have also been given importance in the new curriculum.

These activities would achieve many of the New Curriculum's Statements of What Matters for mathematical development, particularly Geometry which focuses on relationships involving shape, space and position, and measurement focuses on quantifying phenomena in the physical world. The document states:

“Geometry involves playing with, manipulating, comparing, naming and classifying shapes and structures. The study of geometry encourages the development and use of conjecture, deductive reasoning and proof. Measurement allows the magnitude of spatial and abstract features to be quantified, using a variety of standard and non-standard units. It can also support the development of numerical reasoning.

Reasoning about the sizes and properties of shapes and their surrounding spaces helps learners to make sense of the physical world and the world of mathematical shapes. Geometry and measurement have applications in many fields, including art, construction, science and technology, engineering, and astronomy.” (Curriculum for Wales, 2021).

Feature 3

Measuring the depth of stream and investigating flow.

During this activity the children will investigate if there is a connection between the depth of the stream and the speed of the flow. They will use a range of mathematical equipment including measuring sticks and stopwatches to measure the flow of the water at different depths. They will record their findings and come to a conclusion. Through this investigation the children will learn about 'Matter and the way it behaves defines our universe and shapes our lives.' The document states this is an important area of development for children because:

"The universe and all living things are made up of matter. The behaviour of matter determines the properties of materials and allows us to use natural resources, as well as to create new substances. Understanding the nature of matter can help learners to appreciate the impact that chemistry has on the world around them, as well as how it contributes to advances in science and technology. Chemical reactions happen continuously in our environment as well as in living things. Learning how to control and apply these reactions has benefits to individuals and industry." (Curriculum for Wales,2021).

In addition, the children will learn about 'Forces and energy provide a foundation for understanding our universe.'

"Forces and energy can be used to describe the behaviour of everything from the smallest building blocks of matter to the motion of planets and stars. Understanding forces and energy helps us to predict and control the behaviour of our environment. These ideas can be modelled and expressed formally, providing a consistent mathematical framework to describe physical systems. This has enabled some of society's greatest scientific breakthroughs and engineering achievements. An understanding of forces and energy can help learners overcome future challenges and use our planet's resources efficiently and sustainably, helping them become responsible citizens of Wales and the world" (Curriculum for Wales,2021).

The three features outlined above provide a wealth of learning opportunities for children particularly in terms of developing their mathematical and scientific skills and understanding. The activities allow children to apply their skills and knowledge in a real-life, 'hands on' situation, which will be

more meaningful for them. As well as developing mathematical skills, these activities will develop a wide range of cross-curricular skills including literacy, communication and team working. Physical skills will be developed by using a range of different equipment to enhance fine motor skills such as stopwatches and scissors. And improving their gross motor skills in terms of balance and coordination.

RISK BENEFIT ASSESSMENT

Location / Activity:	Clyne Gardens/ Outdoors science and maths exploration activity	Date:	16/09/2021
Assessor:	Sam Founds	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**.

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
Measuring depth of stream.	The children will benefit from this activity by: - Experiencing a hands-on style of learning. - Applying a range of mathematical skills in a real-life context. - Developing their	Drowning	Everyone in the stream is at risk of drowning.	There will be designated first aiders at hand to intervene and act should an individual start drowning.	L
		Animal bites	Everyone attending the event will be at risk be of being bitten by animals and insects.	Adults will be allocated first aid kits which will be equipped with antihistamines which can be provided to whichever person requires them	L

	problem-solving skills.			(providing there are no allergens).	
		Slips, trips, and falls	All those participating in the activity are at risk as.	Children will be instructed to work in pairs and small groups while under close supervision of adults.	L
		Hypothermia	Anyone entering the water will be at risk of hypothermia.	All participants will be instructed to dress appropriately to minimize the risk of exposure to the cold during the activity.	L
		Parasitic/ fungal/ bacterial infections	Everyone attending the activity will be at risk of infections especially those who enter the water	Adults will be allocated first aid kits which will be equipped with antihistamines which can be provided to whichever person requires them (providing there are no allergens).	L
Miniature Raft Building (out of natural materials)	- Children will be able use their creative skills and initiative to complete the task. - Children will also gain a sense of accomplishment once they see their “raft” float and	Cuts and grazes.	Everyone attending the activity will be exposed to the risk of cuts and grazes should they fall	All adults attending will be advised to keep the children under close supervision and instructed to discourage running near the stream.	L
		Allergic reaction	Everyone attending the activity will	All staff and adults attending the activity will be notified of any children with any allergens as well as	L

	participate in the race. • They will develop their knowledge and understanding of natural resources. • Children will also be able to see the forces of water and the effects it has on objects placed • Children will also learn about weights and buoyancy by trying to create a raft from natural materials they have found.			being provided with relevant medical equipment i.e. Epi pens and antihistamines.	
		• Splinters	• Anyone handling pieces of wood will be exposed to the risk of getting a splinter.	• The children and the children's parents/guardians will be notified that gloves will be required before the day of the activity.	L
Miniature Raft Race	• The children would enjoy the element of competition. • They will develop their maths skills by timing the race. • They will gain experience using timing equipment, e.g. stop watches. • They will develop	• Falling into stream and drowning.	• Anyone attending the activity will be exposed to an element of risk of falling into the stream and drowning	• Everyone attending will be advised to stay away from the edge of the stream and adults will be instructed to stop children from coming within 2 meters of the edge of the bank.	L
		• Falling into stream and bumping head.	• Anyone attending the activity will be exposed to an element of risk of falling into the stream and	• Everyone attending will be advised to stay away from the edge of the stream and adults will be instructed to stop children from coming within 2 meters of the	L

	their understanding of natural resources and if the float/sink.		injuring themselves	edge of the bank.	
	• They will develop their understanding of forces and gravity.	Falling into stream and breaking a bone.	Anyone attending the activity will be exposed to an element of risk of falling into the stream and breaking a bone	Everyone attending will be advised to stay away from the edge of the stream and adults will be instructed to stop children from coming within 2 meters of the edge of the bank.	L
		Falling – causing a cut or graze.	Anyone attending the activity will be exposed to an element of risk of falling into the stream causing minor cuts or grazes to themselves.	Everyone attending will be advised to stay away from the edge of the stream and adults will be instructed to stop children from coming within 2 meters of the edge of the bank.	L

Section 4

In order for children to gain the most from an outdoor learning environment they will need to be supported by enthusiastic, skilled practitioners (Rogers & Rose, 2012). The outdoor environment has an abundance of opportunities to develop and apply a wealth of skills and knowledge. One of these is the Theory of Loose Parts which is as described by Simon Nicholson; loose parts are “*open-ended materials that can be used and manipulated in many ways*” (Nicholson, 1971). Adults can provide children with loose parts to help them engage and explore the things around them. Items that can be used for loose parts vary from sticks to shoelaces they can all provide an open-ended form of exploration and play. Using the features from the outdoor area I have selected there can be a great benefit for the children if they are able to use loose parts as part of the activities. Due to the nature of the activity and the location of the setting there will be many loose parts for the children to use both provided by the adults and

provided by nature. Examples of the loose parts that could be provided by adults are corks to help keep their rafts buoyant and shoelaces to help bind their materials together also natural loose parts that the children can use will be sticks and leaves as well as any stones they might wish to drop into the pond to be able to visualise all the effects forces have on things such as a stone being dropped into the water and seeing the water disperse. I designed the activities to incorporate an element of exploration and creativity. This will allow the children to have the most authentic outdoor learning experience.

Significant child development psychologists such as Bruner and Piaget have also both written about the importance of hands-on, practical learning experiences. Bruner (1966) states that young children learn through physical actions, by doing rather than thinking. This theory also corresponds with Piaget's sensorimotor stage theory which states that young children learn more and develop quicker when their five senses are being engaged during play and learning. The outdoors creates the perfect opportunity for the children to learn and play while activating as many of the five senses as possible, from touching the leaves and feeling the texture to hearing the sound heavier objects make when they hit the surface of the pond. Adults can also enhance the children's thinking by trying to promote curiosity and discovery. They can ask the children to try and find specific objects or even ask the children "what if" questions, for example, if a child was asked what they think would happen to their raft if the stream were to stop pouring water into the pond. (Phillip,1961).

The role of the adult is to support the children's learning and prompt investigative thinking. It is important that the adults do not structure the activities too rigidly so that they take away the elements of creativity, problem-solving and team working. The Reggio Emilia approach focuses on six factors that ensure learning that is pupil centred and promotes self-confidence and self-esteem. Many of the factors have strong links to outdoor learning. The approach suggests that the environment in which children learn is their third teacher. Therefore, having access to high quality outdoor experiences is essential in order to maximise the children's learning potential. It is important that any practitioners working with young children understand how to choose an outdoor learning environment that will provide the best opportunities to develop the children's skills through practical experiences.

Outdoor learning is a key component of modern curriculums in Britain, this is because of the many benefits it has in terms of children's learning and development. The outdoor environment promotes skills such as sustained shared thinking, observation, curiosity and discovery. Many of these skills cannot be replicated in the indoor environment in the same way. The outdoor environment is a brilliant resource for encouraging children to challenge themselves, take risks and discover more. Learning occurs when children push themselves out of their comfort zones. (Knight,2013) Sustained shared thinking can be defined as an *"episode in which two or more individuals 'work together in an intellectual way to solve a problem, clarify a concept, evaluate activities, extend a narrative, etc. Both parties must contribute to the thinking and it must develop and extend."* (Sylva et al, 2004). Sustained shared thinking tends to occur between an adult and a child, but it may also be between children, if one child is a 'more knowledgeable other' (Lindqvist G,2003). The idea of 'working together means that it is an active and creative process. Bruner (1961) highlighted the importance of discovery in learning. He suggested that children learn best by discovery through child-led play, rather than adult-led activities. Therefore, the adult should not control the learning experience but instead be part of it with the child.

Mathematics in particular is a curriculum subject that benefits from discovery play as children can count objects found in the natural play space such as leaves, rocks, petals and feathers, collect data and apply measuring skills. In terms of science, the natural world will allow children to discover

patterns and observe different insects, plants or trees. The children will use their skills to enquire and hypothesise about why things have happened in nature. The development of scientific skills along with learning through discovery comes naturally in the outdoor environment. The role of the adult is to encourage children to use their processing skills to observe the world around them and ask questions about it. Children are instinctively curious about the natural world and are like to observe how things have changed or grown. Much of the learning that happens in the outdoors is cross-curricular in that it covers skills from most areas of the curriculum in one go. Often outdoor learning experiences provide the basis for the development of skills literacy, particularly oracy. One of the main benefits of outdoor learning is that it is accessible to all and is also free to use therefore making it an affordable learning experience to any education provider. This can be particularly useful in more socioeconomically deprived areas (Christie, et al, 2014). One of the key roles of the adults will be to ensure the children are able to play and learn whilst also being safe. Friedrich Froebel once stated that “Play is the highest expression of human development in childhood alone is the free expression of what is in the child's soul” (Brunce 2012).

In conclusion; it is apparent that the outdoor environment is an essential resource in developing young children’s skills and understanding of the world around them. It provides excellent opportunities for children to apply their skills in real life situations and is particularly useful for consolidating mathematical and scientific understanding. The role of the adult is important in ensuring that outdoor learning experiences are chosen well and planned thoroughly. However, during outdoor learning experiences it is important that the adult supports the child, rather than controlling the learning that takes place. The role of the adult is to provide the ‘scaffolding’ for learning. Therefore outdoor learning should be a key feature of any Early Years educational setting.

Reference List

- Bruner, U. P. J., Bruner, J. S. (1966). *Toward a Theory of Instruction*. Belknap Press of Harvard University.
- B.Christie, P.Higgins & P.McLaughlin (2014) ‘*Did you enjoy your holiday?*’ Journal of Adventure Education and Outdoor Learning
- Brunce T, 2012, *Early Childhood Practice: Frobel theory*, SAGE Publishers
- C.Otte, M.Bølling, P.Elsborg, G.Nielsen & P.Bentsen (2019) “*Teaching maths outside the classroom: does it make a difference?*”, Educational Research.
- Knight.S (2013) “*Forest Schools and Outdoor learning in the Early Years*” 2nd Ed, SAGE Publications.
- Knaus.M, (2014) “*The little book of maths outdoors*” Teaching Solutions
- Lindqvist G (2003) *Vygotsky's Theory of Creativity*, Creativity Research Journal
- Nicholson, S., 1971. *The Theory of Loose Parts*. [online] Media.kaboom.org. Available at: <<https://media.kaboom.org/docs/documents/pdf/ip/Imagination-Playground-Theory-of-Loose-Parts-Simon-Nicholson.pdf>> [Accessed 21 September 2021].
- Phillip.G(1961) “The Art of Asking Questions”, International Literacy Association

Parker J, 2020, *A walk in Clyne Park*. [Online image] Available from: <https://www.alltrails.com/parks/wales/swansea/clyne-gardens> [accessed 14/09/2021]

Rose.S and Rogers.J (2012) "The Role of the Adult in Early Years Settings" Open University Press.