

I acknowledge the use of Grammarly (<https://grammarly.com/>) on the 27th September 2024 to check my already completed work. This program was on my computer and automatically prompted suggestions on Microsoft Word.

I acknowledge the use of Copilot ([Microsoft Copilot in Bing](#)) on the 22nd September 2024 using these prompts.

I do not have a draft of my work as I did not write anything prior to these prompts. I just these prompts to help me understand the resources I was reading.

Prompt 1: Summarise Vygotsky's theory of cultural development

Prompt 2: Summarise Assessment arrangements in relation to the Welsh curriculum

I confirm that I have not presented any AI-generated text as my own work. I hold drafts of all prompts used in Copilot and draft work before using Grammarly in my final draft.

Awe and Wonder: science, mathematics and the outdoors



(Hayley Alderman, 2024)

Coastal School Experience

A group of 15 six-year-olds in the academic year 2, will be taking part in a coastal school experience in addition to the forest school curriculum opportunity. The class teacher and two teaching assistants will support the children giving a 1:5 ratio. The seaside town is approximately 20 minutes travel in a minibus from the school. Each group will have one school iPad, a small selection of loose parts and learning objectives.

On arrival at the beach, the children will assemble a single line along the barrier to the beach. The Welsh Curriculum states that the outdoors stimulates children's senses (Welsh Government, 2022). Therefore, the early years practitioners should begin the trip by exploring some the senses with open-ended questions. A leading adult should suggest that all children take a deep breath through the nose exploring all the seaside smells. Repeat this a few times giving all the children the opportunity to explore their sense of smell and their recognition and connections to different smells.

One question can be "What can we smell children?" Listen to the children's descriptions and explanations of smells they recognise. Some children may experience the same smells or describe memories from the beach. Alternatively, this may be the first time for some children so they will learn from their peer's descriptions and knowledge.

To continue further progression in the children exploring their senses ask the children "What can you hear?" and "What can you see?" to allow the children time to fully take in what is around them and what is new to them. This links to what matters statement in the Welsh curriculum that our world is natural, diverse and dynamic. Children's natural curiosity of the natural world will help them understand and contribute to their spiritual development and well-being (Welsh Government, 2021).

During this time spent standing beside the beach the children will be given a piece of card and asked to roll it into a cylinder, creating a telescope-type shape to observe the scenery in front of them and describe what they can see. A leading adult can prompt the children and guide them towards the boats, animals, people, waves, seaweed, shells and flotsam to encourage the interest of the child in everything around them. Questions such as: -What birds can you see? What direction are they flying in? What are they eating? What can you see on the sand? Is there anything dangerous?

A learning opportunity whilst taking in the scenery will be to also explore what is in the sky. The role of the adult here will be to direct the conversation to the clouds. This will support the progression step 1 to allow the child to show curiosity and question how things work (Welsh Government, 2020). The word evaporation can be the focus of this conversation explaining that the clouds absorb moisture and then hold tiny droplets that

form clouds. Which is called evaporation (NASA, 2019). The children are given the opportunity here to use their thinking skills and process information.

These connections from senses support past experiences, memories and build on previous learning.

As the group moves to the beach the first task will be to set boundaries for the children to allow the adults to keep the children safe and within purposeful areas of learning and exploring opportunities. Building on the children's knowledge they will be asked to use their yellow cones from school to make a shape for their group to be inside such as a square, triangle and circle as the boundary wall.

Loose parts will be provided in each group to encourage creative play, learning and development.

Group one will be provided with buckets and instructions to explore their area for beach treasures. Beach treasures should be explained to the children as items that are found at the beach that would not usually be found in their school learning environment. The practitioner will need to demonstrate a beach treasure by showing them a shell, sea glass, pebbles, mermaid purse or driftwood looking at the detail, shape and color to support cross-curricular skills.

Children may use their hands or beach objects to dig around for possible hidden treasures and explore textures of objects they may not be familiar with. It is ok to find more than one of the same items during this task. At the end, the group can explore what is the most popular hidden treasure and how many items were found altogether.

Once all hidden beach treasures are explored the children will be asked to work together to sort their objects into sets and count them. This will support the progression step 1 learning in the mathematical language of the children describing the quantities and comparisons of more than, less than, and equal to (Welsh Government, 2019).

To conclude the group will need to take a picture of their findings and the sets of beach treasures they have created to support follow-up classroom tasks. There will also be an opportunity to be creative and see if they can build anything out of their objects or create some beach art.

Group two will have spades that are different sizes, some large and some small. The task will be to use the sand to create a beach boat. The children will be using their fine and gross motor skills to dig out large and small parts of the sand to create a boat. The practitioner will need to prompt the use of surrounding loose parts to encourage the imagination and planning of the construction of the boat. The use of questions like "What can be used as an oar, a sail, a seat or a steering wheel/device?" Can the

children build a steering wheel out of sticks or large pebbles or possibly use a rock for the seat?

This task builds on the progression steps 1 and 2 in design thinking and engineering in creative ways by investigating and communicating their findings (Welsh Government, 2019).

Whilst the use of small loose parts found on the beach can help build boat, the use of larger beach objects like rocks will create an opportunity to explore gravity. Gravity being a force that keeps us on the ground and everything around them (Admin, 2015).

The role of the adult here will be to explain how gravity is keeping their built steering wheel together, keeping the oar resting on the side of the boat. Step by step describe the parts of the built boat and gravity's role in keeping the boat together.

Outside of the boat activity, demonstrate gravity by dropping a spade, a pebble, driftwood or even the boundary cones on the beach explaining that the gravity force is keeping these objects on the ground. The aim here will be to support the awareness of gravity at the beach.

Group three will be provided with fishing nets, cooking sieves, buckets and small watering cans. Surrounding this group will be a rock pool and tide area encouraging water play and the inquisitive thinking of the children. The practitioner will lead this group with questions that will help the children to problem solve and critically think.

Initially allow the children free play and see how they use the loose parts and demonstrate any knowledge, development of skills and experience.

The practitioner will need to follow the lead of the children with their inquisitiveness during the findings of loose parts and sea creatures in the water.

Children will become more engaged with authentic resources to make connections in their learning in the real world (National Day Nurseries Association, 2022).

As this will be a question-led activity, direct the children to think and understand the change in weight in objects when they fill them with water and what they are collecting through the nets and sieves. There is a possibility that they will collect crabs, seaweed, shells, jellyfish and flotsam. Therefore, explore with the children's different relationships between living things, their habits and the life cycles that build on the progression step 2 of living things in the world around us (Welsh Government, 2019).

To conclude the task request that the children take lots of pictures of their findings to make connections back at the school environment.

RISK-BENEFIT ASSESSMENT

Location / Activity:	Coastal School Experience	Date:	10/09/2024
Assessor:	Hayley Alderman	Review date:	21/09/2024

Experience exploring outdoor space in photograph	How will young people BENEFIT from this activity?	Hazards and associated risks	Who is at risk?	PRECAUTIONS in place to reduce the risk of injury	Overall risk after precautions RATING: L/M/H
Observation Task	The children will explore their senses and try to make connections through sight, smell, and sound. The group will have exposure to possible objects & views they have not experienced before. The independence to express their knowledge of sea life/birds and their memories of the beach.	Ensuring the group of children always stay safe and close together. Contact with members of the public. The nearby roads and cars near the parking of minibus. Dogs and other animals on and around the beach.	Teachers All children Members of the Public Animals	Teachers are to be with their assigned group of 5 children at the point of departure from the bus. Educate the children on road safety prior the trip. The groups will be listed given to the children two days prior school trip. Create boundaries by holding hands and adult voice instructions to crossroads safely. Awareness of stranger danger and that the adults attending the trip are safe.	LOW

	They will manipulate paper resources to create their loose part in the curiosity of their surroundings. They will work as part of a team sharing what they can see, smell, and hear. Group discussions will be supported with open-ended questions to give the children time to problem-solve.	Insects and bugs. Bees and wasps Seasonal allergies like hay fever. Risk of sunburn.		Discuss boundaries regarding family pets and not to touch/pet animals that are not our pets. Allergy medication for children with allergies, including epi-pens and antihistamines. Complete medication forms on the day of the trip. Teaching staff will educate the children in the classroom leading up to the coastal trip about safe insects and bugs. Full teacher supervision of the children at all times during this task. Sun protection. Consent from parents. First aid box.	
Beach Treasures	The children will experience hands-on exploration of loose parts in their natural habitat. There will be opportunities to learn about insects and sea life at the beach. There will be learning targeted towards beach rubbish and what is washed up from the sea directing	Broken glass Broken shells Broken stick Sharp Rocks Pebbles Flotsam Allergies from bees, hay fever, insects Risk of sunburn	All children Teacher Members of the public Animals	Make the children aware of possible hazards before the trip. Show examples of items on the beach that are safe and not safe. Take a laminated visual prompt of hazardous loose parts. Teaching staff will educate the children in the classroom leading up to the coastal trip about safe insects and bugs.	LOW

	learning towards the natural force. Objects unfamiliar or lost possessions buried beneath the surface. There will be examples of different shapes and sizes of loose parts to direct learning to mathematics.			Explain dangerous sea life like jellyfish that may be washed up. Provide pictures and instruction not to touch such sea life animals. Sun protection. Allergy medication for children with allergies, including epi-pens and antihistamines. Full teacher supervision of the children at all times during this task. First aid box	
Beach Art	Problem solving. Creative thinking. Gross motor movements and fine motor skills manipulating the spade. Hand-eye coordination. Teamwork and communication with peers. Benefit from accomplishment when the creation is complete.	Broken glass Broken shells Broken stick Sharp Rocks Pebbles Flotsam Oil and collapsing holes when digging too deep. Allergies from bees, hay fever, insects Risks of sunburn	All Children Teachers Members of the public	Make the children aware of possible hazards before the trip. Teaching staff will educate the children in the classroom leading up to the coastal trip about safe insects and bugs. Show examples of items on the beach that are safe and not safe. Keep a visual on laminated resources reminding them of safe and non-safe beach objects. Advise children to dig shallow in creating beach art.	LOW

				Advise the children to fill the holes before leaving to prevent hazards to the public. Full teacher supervision of the children at all times during this task. Sun protection Allergy medication for children with allergies, including epi-pens and antihistamines. Consent from parents. First aid box.	
Water Play	Sensory experiences of different weights and temperatures of water. Social interactions with peers using their imaginations and role play. Emotional well-being benefits as water can be therapeutic play. Creative thinking. Problem-solving on transporting water effectively. Cognitive skills towards understanding loose parts and their purpose.	Broken glass Broken shells Broken stick Sharp Rocks Pebbles Flotsam Deepwater Allergies from bees, hay fever, insects. Risks of sunburn. Slippery surface. Drowning.	All Children Teachers The public Animals	Educate the children before the trip about water safety. Be aware of any beach flags present and advise children accordingly of the boundaries and meaning of flags. Adult to lead the task of checking the depth of water in rock pools and the consistency of sand being tread on. Make the children aware of possible hazards prior the trip. Show examples of items on the beach that are safe and not safe. Keep a visual on laminated resources reminding them of safe and non-safe beach objects.	MEDIUM

	Explore different types of weight of water.			Full teacher supervision of the children at all times during this task. Consent from parents. Sun protection. Allergy medication for children with allergies, including epi-pens and antihistamines. First aid box.	
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Part 4: Theory and research evaluating how adults working with early years children support and encourage children to engage with mathematical and scientific concepts in an outdoor environment.

The importance of outdoor play has been highlighted by the Welsh Government in supporting the development of learning opportunities for children in their early years (Welsh Government, 2009). Sedgwick (2012) maintains that every child should experience their world beyond the classroom, and it is an essential part of their learning and personal development. McCree, Cutting and Sherwin (2018) believe that social free play outdoors can build emotional resilience in relationships and deepen a child's awareness of self-regulation. The Welsh Government (2023) guidance sets out frameworks to ensure that there is quality provision for all children in the early years to support their development with five development pathways. These are belonging, communication, exploration, physical development and well-being. Furthermore, Williams (2022) explains that the curriculum for Wales allows settings the freedom to develop their own curriculum to teach through learning and experiences in Science and Technology, Humanities, Health and Wellbeing, Mathematics and Numeracy, Expressive Arts and Languages, Literacy and Communication. In addition, the Department for Education (2012) suggests that outdoor learning can aim to embed learning around sustainability and prepare children to handle their future sustainably.

Inclusive pedagogical approaches to teaching children can help create an environment that allows every child to feel supported and valued in their early years setting (Murphy and Conn, 2022). Birth To 5 Matters (no date) points out that inclusive early-year's practice is about the practitioner anticipating, paying attention, responding and reflecting on the child's needs and interests. This is in accordance to the United Nations Conventions on the Rights of the Child (UNCRC) Article 12 that every child has the rights to express their thoughts, feelings and wishes and to be taken seriously by their responsible adult (UNICEF, 2019). Additionally, the Welsh Government (2024) suggests that enabling adults should proactively keep up to date with their professional learning and understanding of childhood development to enhance their quality of care.

It is suggested in the curriculum for Wales that early years practitioners should source local and unique resources in the school environment to enhance learning in mathematics, numeracy, science and technology (Welsh Government, n.d). For example, Gorrie (2021) refers to the 'The Loose Parts Theory Nicolson (1971)' that describes loose parts as any resources or objects that can be moved, manipulated, or sorted in a combination of ways. For example, materials such as cardboard boxes, bottle caps, household items like spoons and natural materials like wood, twigs and rocks (Haughey, n.d.) Loose parts play is predominantly a child-led form of learning

however, it can develop skills across the whole curriculum and be equally effective at home and at school (Williams and Stevens, 2019). Beyond the simple use of materials Nicolson (1971) encourages the use of music, gravity and words that promote the use of cross-curriculum activities outdoors. (Gorrie, 2021).

Curriculum and Assessment (Wales) Act (2021) states that it is the duty of the adult in the early years provision to make appropriate arrangements to assess the progress, next steps and the instruction and learning of the children's development to achieve future progress. White (2014) is convinced that adults need to be knowledgeable and enthusiastic to unlock children's potential outdoors.

Tovey (n.d) suggests in the Froebelian approach of learning that the role of the adult is to observe, support and extend play and learning opportunities. Fredrich Froebel (1782 – 1852) was a well-known German educator who created the first kindergarten where children were able to grow and develop at their own pace with the support of knowledgeable adults (Tovey, 2013). Froebel also believed that the power of play can help children make deeper connections and awareness of the world around them (Froebel Trust, no date.) Tovey (2016) also agrees that learning should be made meaningful and connect with the children through repeated experiences. These types of learning methods are known as schemas (Froebel Trust, no date).

Birth to 5 Matters (2021) connects Piaget theory to this and that practitioners need to be influenced by schemas to help them understand the importance of repetition in children learning. Schemas are patterns of repeated actions observed by a practitioner of a child's fascinations building a foundation of knowledge and awareness of a child (Professional Association for Childcare and Early Years, no date). Koehler (2021) suggests that Piaget was fascinated by children and their progression of cognitive development through being inquisitive and constructing their knowledge (Koehler, 2021)

Brown (2015) believes that the mosaic approach supports adults in collecting data through a range of observing opportunities to create individual tiles in building a big mosaic of the child. Similarly, Clark and Moss (2011) agree that when adults are building enabling environments, they should use purposeful discussions and observations that are implemented in practice and shared with parents to provide clarity and understanding of the child's priorities.

An enabling environment is a physical indoor and outdoor environment that provides space, accessibility, stability, high-quality resources and displays (Hodgman, 2012). Care Learning (2024) agrees that environments need to be accessible for

children however, adults need to prioritise safety by eliminating hazards allowing them to play freely and inclusively.

Flavin (2020) suggests that an adult can lead these environments with the Reggio Emilia approach allowing children a more hands-on scientific experience to encourage exploration, discovery and play. Waite (2011) argues that if an adult takes too much control in an activity the relevance to the child will be reduced and that the adult should only model and direct learning to support the child's independence and creative role play. Furthermore, Cohen and Waite-Stupiansky (2019) suggest that to be able to deepen learning in scientific and mathematical engagements the adult needs to model, challenge and provide stimulating environments and experiences of the natural world. Grenier and Vollans (2022) argue that practitioners need to plan guided activities that focus on key mathematical shapes and numbers during outdoor learning to ensure the child is not distracted by the water, splashing and loose parts.

Watts (2020) believes that outdoor play learning experiences can encourage curriculum progression with scientific awareness of different weathers and different types of materials found in forest schools through the four seasons. A video resource by Hewitt (2018) describes forest school as a place where you see teamwork, resilience, problem- problem-solving and that adults supporting this experience can benefit from being outdoors too. Hewitt (2018) also explains that the skills learned from outdoors can be transferrable skills that can be used in the classroom.

Children will naturally explore the world around them as they perceive it and acting on their perception of a shape or object will influence their actions, and this is known as the affordance theory (David, 2014). The concept of affordance stems from the ecological approach to psychology of J.J Gibson (1966) which suggests that objects in enabling environments offer multiple possibilities for actions to a child depending on how they perceive it (Wells, 2002). Bento and Dias (2023) claim that children's most natural affordance has been recorded in outdoor settings or with natural-based pedagogical approaches. The curriculum for Wales's four purposes says that practitioners are to develop children to be creative contributors and apply their knowledge and skills to create ideas and play a full part in life and work (Welsh Government, no date, a). The Welsh Government (no date, b) believes that children need consistent and robust evaluations of scientific and technological evidence to become ethical citizens of the world.

Lev Vygotsky, a psychologist, proposed a theory with the concept of scaffolding the cognitive development of a child (Hodgson, 2020). Prospero Teaching (n.d) claims that Vygotsky's theory encourages a practitioner to provide the child with temporary guidance to help them achieve a task that is potentially beyond their current

ability. Moreover, Clarà, (2017) suggests that the Vygotsky's theory highlights that learning is a social process where interactions with instructions from knowledgeable practitioners push the progress of children's learning development. Additionally, Wheeler (n.d) claims that Jerome Bruners scaffolding theory was influenced by the ideas from Vygotsky and that he believed that children learn new concepts by receiving help from teachers and other adults. Bruner's scaffolding theory is for an adult to support a child and gradually remove guidance as they progress in that skill (Early Years TV, no date).

Early years practitioners are supported in practice to follow the Welsh curriculum frameworks and legislations such as the Well-being of Future Generations (Wales) Act 2015 Future Generations Commissioner for Wales (n.d.) helps public bodies be aware of the long-term future impact of their decisions and to ensure the Welsh curriculum adequately supports the children of Wales to become ethical informed citizens.

There is robust theory and evidence to show that the adult's role is important in supporting a child in the early years. The Welsh curriculum promotes teaching strategies and progression steps to monitor children's progress through the early years by adapting environments to direct focus on mathematical and scientific activities (Welsh Government, 2019).

Birth to 5 Matters (2021) supports theories such as Froebel and Piaget that have progressed the movement in early year development and teaching outdoors. Early years practitioners have the autonomous decisions to create and adapt quality provisions with natural resources, and accessibility that have an inquisitive focus on mathematical and scientific learning (Welsh Government, 2023).

Conclusion

It cannot be denied that the importance of the role of the adult has been highlighted throughout the research and theories however, it does also strongly believe that the freedom to play and make personal perceptions on materials undoubtedly encourages children's learning development. A practitioner that is up to date with their professional development (Welsh Government, 2023) become knowledgeable and enthusiastic practitioners encouraging the performance of a child (White, 2014). Hewitt (2017) believes that to encourage the enthusiasm of practitioners is to explore their enjoyment and benefits from the outdoors driving learning experiences.

Play has a power that can help children build better awareness of materials and environment that make connections with the world around them (Froebel Trust, no date). However, there is a duty that the practitioners appropriately assess the progress of the children and document their next steps to further develop their skills (Curriculum

and Assessment Act, 2021). In addition, sharing the observations and conversations with parents and other practitioners builds a foundation in understanding the child's interests, abilities and inquisitiveness (Welsh Government, 2021). Therefore, when practitioners have knowledge of their children and perform purposeful modeling of tasks and use of loose parts the focus on mathematical and scientific learning is more beneficial. It is also important that natural materials are accessible in addition to recycled loose parts to increase awareness and curiosity about the wider world and nature around the child (Cohen and Waite-Stupiansky, 2019).

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