

Section 1.



(Source: Taiga,2016).

Section 2.

Feature 1- The Sea.

Volume and capacity

Activity- Filling, emptying and pouring water at the seashore using different sized buckets and funnels.

Learning Opportunities: Exploring volume and capacity, learning that different amounts of water are needed to fill different sized buckets. Conceptual understanding will increase with age. Developing and using mathematical language such as, more, less, full and empty. Younger children may say 'all gone' or 'lots'. The Practitioner could extend learning if invited to engage by asking questions such as 'Which bucket do you think holds the most water? Let us find out' (Montague-Smith and Price, 2012).

Holistic Development: Physical Health and well-being, literacy and communication.

Resources: Different sized buckets, funnels and shaped containers.

New Curriculum Links: - This links to the Geometry progression steps within the Maths and Numeracy Area of Learning and Experience (Welsh Government, 2020a).

Forces

Activity- The Children could make a mark in the sand near to the shoreline using natural materials found such as sticks or shells. The Practitioner must explain that tides can be dangerous, and they must have an adult with them at the sea (Romero, 2019).

Learning Opportunities: They could re-visit the area throughout the day to see if the mark is still there, if the mark has gone the tide has or is coming in and washed it away. The children will then know they should move to the top of the beach or off it. An explanation can be given here about the moon when above the beach pulling the water up over the sand learning about gravitational forces.

Holistic Development: Physical Health and Wellbeing.

Resources: Tablets could be brought to the beach for the children to watch a child friendly information video about tidal forces or it could be watched at the setting beforehand such as Noaa SciJinks (2021).

New Curriculum Links: This links to the Being Curious and Forces and Energy progression steps within the Science and Technology Area of Learning and Experience (Welsh Government, 2020b).

Feature 2- The Sand.

Counting

Activity- Collecting loose parts such as shells and sticks.

Learning Opportunities- This promotes exploration using the resources provided. Children often like to show what they have collected 'look at these shells I have collected'. This is an opportunity for the practitioner to engage in questioning, for example 'Wow, I wonder how many you have got? Shall we count them?' This can support children's understanding of number sequencing and by holding your fingers up as you count you are introducing the concept of cardinality, something that Sarnecka (2019) says needs to be introduced at a young age as this helps children understand other mathematical concepts. Estimation concepts can be introduced by asking questions like 'I wonder who has the most shells?'. Mathematical language is also encouraged and supported such as more, less, heavier and lighter. Robertson (2017) says that loose parts play has an abundance of opportunities for mathematical development.

Holistic Development- Physical Health and Well-being, Language, Literacy and Communication.

Resources: Buckets of different sizes, spades.

New Curriculum Links: This links to The Number System progression steps within The Mathematics and Numeracy Area of Learning and Experience (Welsh Government 2020a).

Shapes

Activity- Building Sandcastles.

Learning Opportunities- This will give them an opportunity to not only revisit prior learning on tides but to extend on this by exploring the properties of the sand such as changes in its texture and weight when wet compared to dry and how this helps the sandcastles keep shape. They can also explore, see and feel 3D shapes which will help with identification of 2D versus 3D shapes and their properties such as straight and curved lines and edges and surface areas. They may also use loose parts found to decorate the sandcastles and make patterns and use them to mark make and absorb associated mathematical language (Robertson,2017).

Holistic Development: Expressive Arts, Physical Health and Well-Being, Language, Literacy and Communication and Science and Technology.

Resources: Different sized and shaped buckets, spades and rakes.

New Curriculum Links: This links to the Geometry progression steps within the Maths and Numeracy Area of Learning and Experience (Welsh Government, 2020a).

Identification and classification

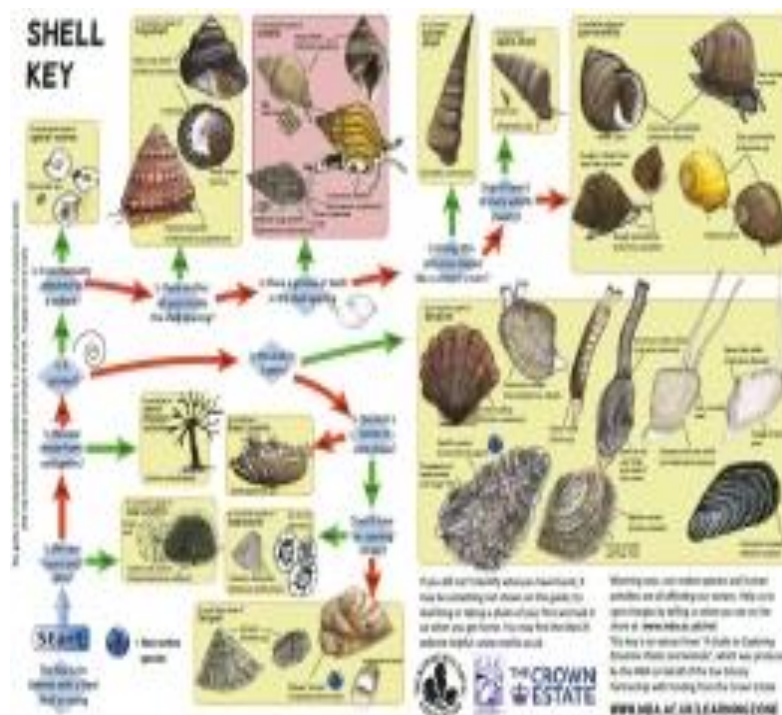
Activity: Identifying different types of shells.

Learning Opportunities: Promotes scientific inquiry. 'Where do the shells come from?' 'Who do they belong to?' They may also sort and classify the shells by size, shape and type. The Children will also be extending their vocabulary and scientific knowledge.

Holistic Development: Physical Health and Well- Being, Science and Technology and Language, Literacy and Communication.

Resources: Books, Identification Key, Spades, lots of different containers as they are a necessity for not only collection but to ignite and hold interest (Duncan and Patet, 2016). Are they functional? Can items be easily seen once inside?

New Curriculum Links: This links to Statistics Represent Data progression steps within the Mathematics and Numeracy Area of Learning and Experience (Welsh Government 2020a). This links to the Being Curious and The World Around Us progression steps within the Science and Technology Area of Learning and Experience (Welsh Government 2020b).



(Source: MBA, 2017).

Feature 3- The Rocks.

Sea life species

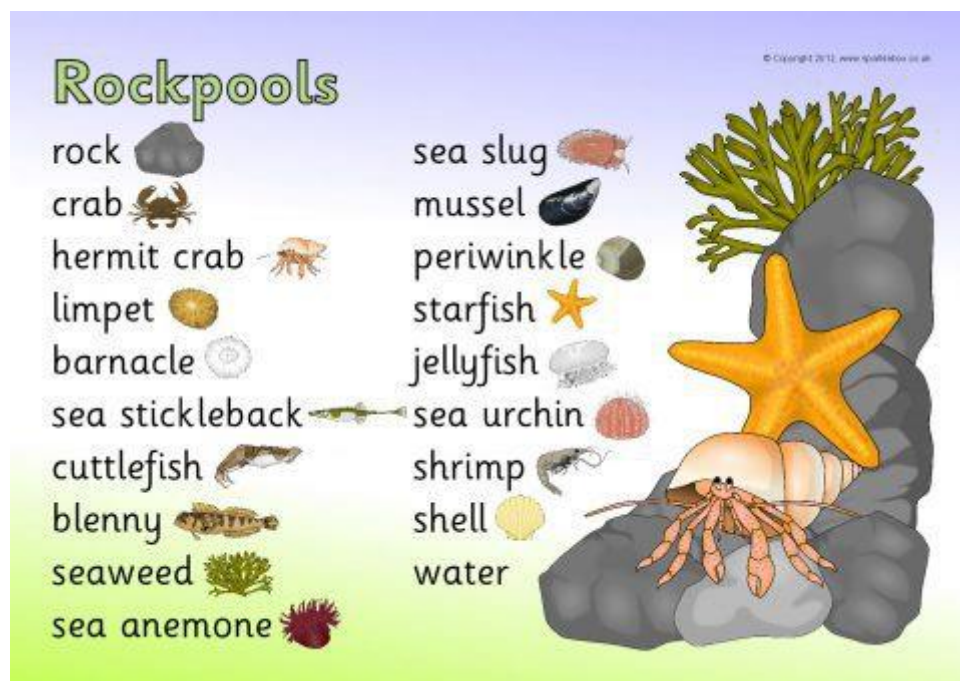
Activity- Rock pooling, exploring sea life and habitats.

Learning Opportunities: Opportunities for children to learn about living things and their habitats. They learn how to care for and respect living things. This activity could be extended to visit the rock pools at different times of the year to see the different creatures found.

Holistic Development: Language, Literacy and Communication and Physical Health and Well-Being.

Resources: Fishing nets, clear containers so the children can observe the creatures clearly, books and identification keys, magnifying glasses, non-slip footwear and waterproof clothing.

New Curriculum Links: This links to the Being Curious and The World Around Us progression steps within the Science and Technology Area of Learning and Experience (Welsh Government 2020b).



(Source: Sparklebox, no date).

Measurement

Activity- Exploring and climbing rocks.

Learning Opportunities- This gives the children an opportunity to explore size. They could measure the size by the amount of time it takes to climb the different ones and compare or by how many steps it takes to cross one compared to another. The children could also look for natural materials on the beach such as different size sticks to measure the height/width of the rocks. Let the children explore but support the children if invited to engage by asking questions for example 'How many sticks do you think will make the same size as that rock? It can introduce relevant mathematical language such as bigger than, smaller than, taller and wider. It also supports the concept of shape. Children also learn to listen to rules and boundaries and how to be as safe as possible.

Holistic Development: Physical Health and Well Being, Language, Literacy and Communication.

Resources: Appropriate footwear and meter sticks.

New Curriculum Links: This links to the Geometry progression steps within the Maths and Numeracy Area of Learning and Experience (Welsh Government, 2020a).

Section 3**RISK BENEFIT ASSESSMENT**

Location / Activity:	The Beach	Date:	September 7 th 2021
Assessor:	Racheal Stein	Review date:	January 7 th 2022

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
Filling and emptying buckets at the shoreline.	Exploring volume and capacity by filling and pouring. Introducing mathematical language such as more and less. Promoting health and wellbeing by communicating their thoughts, following rules and boundaries and learning to keep safe. Promoting their physical development by bending, stretching and carrying.	- Falling in the water. - Wading out to far. - Being bitten/stung.	Children and adults.	- Rules and boundaries about how far they can go into the sea. - Increasing the staff to child ratio, possibly one to one. - Wearing life jackets. - First aid kit and first aider present.	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
Making marks in the sand to observe tides.	Developing their understanding of safety and tidal dangers. Mark making using natural materials such as sticks found at the beach. Developing their scientific knowledge about gravitational forces causing the tides. Promoting physical development by bending and fine motor skills also.	- Falling in the water. - Being bitten or stung. - Splinters from sticks. - Sharp sticks in other's eyes.	Children and adults	- Setting out rules and boundaries about not going out into the sea. - Increasing staff ratio. - Wearing life jackets. - Explain about certain creatures that they may see that could sting or bite such as jelly fish. - Watch a video to explain about tides. - Having a first aid kit and first aider present.	L
Jumping in the waves	Counting and exploring numbers, sequencing and cardinality. Promoting gross motor skills by running and jumping. Promoting the children's understanding of their movements in different environments have different consequences. Feeling the temperature of the water.	- Falling in the water. - Being bitten/stung.	Children and adults	- Setting out rules and boundaries about how far out in the sea they can go. - Increasing the staff to child ratio maybe one to one. - Wearing life jackets. - First aid kit and first aider present.	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
Collecting loose parts such as shells and sticks	Children can explore what different materials can be used for, how they feel, what they look like, similarities and differences. Exploring counting (cardinal and ordinal numbers) measurement and weight. Could support a schema.	• Going further than they should. Collecting unwanted items such as rubbish/ glass. • Putting things in their mouths. • Throwing pebbles and sticks.	Children and adults.	• Setting out rules and boundaries about how far they can go to explore. • Golden rule, nothing in mouths. • Explain that there can also be things on the beach that should not be picked up such as dirty rubbish, glass and sharp objects.	L
Building Sandcastles.	Exploring properties of dry versus wet sand. Exploring 3D shapes, surface area, symmetry, measurement and associated mathematical language.	• Getting caught in the tide. • Broken equipment.	Children and adults	• Rules and boundaries about how far they can go to explore. • Check all equipment for breaks and damages. • To be aware of tidal changes.	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 in differing Weather Conditions.	Exploring the environment in different weathers at different times of year will allow the children to see and feel differences in appearances, textures, temperatures and living things. Exploring vocabulary such as wet dry, windy and stormy. Learning about risk associated with weather for example thunder and lightning and higher tides.	- Stormy conditions could cause very high tides. - Very wet and windy conditions could make it hard for children to explore. - Children could become very cold or suffer sunburn or sun stroke in hot conditions.	Children and adults	- Check weather forecast, postpone in extreme conditions. - Suitable clothing, sun cream and fluids.	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
Climbing Rocks.	Explore size and measurement, shape and associated mathematical language such as big, small, wide, narrow. Promotes gross motor skills in physical development such as climbing, stretching, jumping and spatial awareness.	Slipping on the rocks/ getting stuck on the rocks.	Children and adults	- No climbing in very wet weather. - Rules and boundaries about how far up the rocks they can climb. - Suitable clothing and footwear. - First aid kit and first aider present.	L
Exploring Rock Pools.	Exploring and identifying living things and learning about their habitats and why they are important. Learning respect and care for sea creatures. Physical development such as bending and stretching.	- Slipping on the rocks. - Being bitten or stung. - Tidal changes.	Children, adults and living things.	- Suitable clothing and footwear. - Avoid climbing in very wet weather. - Be mindful of tidal times and changes. - Show respect and kindness to creatures.	L

Section 4

White (no date) shares in her vision and values that young children achieve greater developmental outcomes by having opportunities to experience play outdoors that stimulates and excites them. The facilitators to this are adults who have knowledge and who indulge in the awe and wonder as passionately as the children they care for. White goes on to say that it is a children's right to have these enjoyable outdoor experiences. Bilton (2010) supports this and says that children who have access to outdoor experiences are developing in all areas and that when observed the enjoyment that children get from these experiences can be seen on their faces. Similarly, Rosenow and Wirth (no date) state that they have witnessed the difference that being outside in nature makes to children's holistic development. However, they also state that there are a lot of children that do not have access to this opportunity. This is due to wide open spaces that were available years ago now being built upon and developed. Even the space they play on outdoors at schools or settings are empty safe surfaces and that the cotton wool culture has removed children's ability to explore with curiosity. However, they say that practitioners can turn this around and enable the outdoor environments for children to experience once again exploration, discovery and curiosity.

Bruton and Thornton (2010) state that children's scientific and mathematical learning comes from their own interests. Therefore, the adult through their observations should be able to identify children's interests and provide resources and an environment that sparks interest and challenges them to further their scientific learning. Rowan (2018) describes this as supportive of the Reggio Emilia Approach, where learning is child led. Children follow their own interests, adults observe and provide 'provocations' that encourage the children to explore further. Gribble (2017) states this approach teaches them to become confident communicative learners who learn to become creative through a variety of ways including maths and science. The children are valued and listened to and the children's questioning gives an opportunity for both adults and children to learn together. This sustained shared thinking is important because it allows the children to take the lead and allows the adult to support by using sustainable questioning and encourages metacognitive talk (Brodie, 2016). This is derived from socio constructivist theorist Vygotsky, who believed that children learn through language, communication with others around them and by being supported by a knowledgeable adult who helps to further their learning known as The Zone of Proximal Development (Conkbayir and Pascal, 2014). However, Purdon (2014) in her paper on practitioners' perspectives of sustained shared thinking states that SST does have some implications such as practitioners having enough time to dedicate equally to each child and that due to group sizes others may interfere and disturb the process which led to a feeling that more training on SST is needed especially for new practitioners.

Bruton and Thornton (2010) go on to say practitioners could enable settings garden areas by ensuring there are areas with trees, plants and soil that can encourage children to look for living things. Ensure there is also free space to move around, sand and water areas with different containers and tubes and a tap for the children to access running water for themselves. Materials such as wood, sticks and tarpaulin can

encourage den building. Tovey (2013) says by providing this sort of Froebelian environment with open ended resources adults are providing an exciting learning environment which helps to cement the children's understanding of the natural world and its element of curiosity. However, White (2014) explains that going beyond the settings garden offers so much more potential. Adults should allow children to explore the local natural area at their own pace. It offers opportunities to explore other natural materials in the real world, that may not have been seen in their garden. White adds it offers an opportunity for children to become familiar with their community and an awareness of what else is around them, exploring signs, numbers and size by looking at big buildings, small buildings, tall trees, rocks and so much more. Outdoor natural environments provide endless learning opportunities.

Forest schools is one such approach that believes in giving children opportunities to have real life experiences in a natural environment such as woodland to encourage the holistic development of the child, which is child-led whilst the children are once again scaffolded by knowledgeable adults (Forest school association, no date). According to Knight (2013) The Forest School Approach is closely linked to the Steiner approach, whereby the adult provides an interesting enabling environment that takes advantage of the natural materials found in the outdoors to aid children's exploration, discovery and therefore scientific, mathematical and holistic learning. Knight goes on to say uneven ground, Sticks, stones, acorns, creatures and water all offer opportunities for the children to build, count and learn about surfaces and materials and so much more.

The outdoor environment that is pictured and focused on within this portfolio is The Beach. The Beach offers the opportunity for children to connect with nature and develop through experiences at a place that offers a unique learning environment (The Wildlife Trusts, no date). Horvath (no date) states that by allowing children to explore this area they are learning about the changes that can be seen, they are carrying out investigations, discovering facts and engaging in sustained shared thinking. Activities that can be carried out at the beach such as the activities detailed in this portfolio will allow children according to Horvath to develop sense of number through counting the natural materials whilst encouraging mathematical language. She says they will see and feel shapes, surfaces and create patterns. The water and sand will offer opportunities to explore measurement, weight, volume and texture. The sea and rock pools will offer opportunities to learn about living things and their habitats, she says it has endless opportunities. Warden (2012) states for young children visiting the beach for the first time it is a very sensory experience that promotes early scientific discoveries. The children move from soft sand to wet sand to the gentle waves, feeling with their feet and hands the different materials and how they change.

However, Pranzini *et al.* (2017) says that the beach also carries risk and states that children account for over half the drownings that happen and almost all the total sand coverings, putting them in the most at risk category and so children's safety at the beach must be the top priority. Gill (no date) agrees that safety is important but there must be a balance enabling the children to experience freedom to explore. Gill states that the desire to explore and investigate themselves is an innate part of children's childhoods right from the very start. However, the worry of something going wrong

takes over which results in children missing out on experiences where they get to experiment, learn about safety and the chance to become resilient individuals.

Fulton (2014a) supports the benefits for children when they take risk in the outdoors. He states that they need the opportunity to assess their own risk and therefore safety allowing them to test boundaries and develop resilience. He goes on to say therefore practitioners who will be already aware of carrying out risk assessments should also consider the benefits that taking risk provides and carry out a risk benefit assessment as has been carried out in this portfolio.

Fulton (2014b) states that it is not only risk taking, mathematical concepts and opportunities for science that occur outside but the opportunity for children to have access to large open spaces that allows them to make big movements and therefore they are exercising both body and mind simultaneously. Some of the activities carried out at The Beach in this portfolio such as climbing rocks, collecting natural loose parts and jumping over waves at the shore according to Tinney (2021) provide opportunities for the children to develop their gross and fine motor skills by jumping, climbing, stretching, bending, pulling themselves up, picking things up with their fingers and so many more. Allowing them to also develop their senses such as balance and proprioception. Ouvry and Furtado (2019) state that this development of the vestibular system aids concentration and further to this the need for movement is present before birth and movement helps with neural connections in the brain aiding learning and development.

Beach schools follow the Forest Schools pedagogy (Plas Derw Trust, no date). First Discoveries (2017) say that the role of the adult at this outdoor natural environment is to observe the children, noting their interests and to support the children when invited to play by working together and asking questions to further their learning and development. The natural parts available in this rich environment such as shells and sticks give opportunities for the children's learning to be led by them.

In the activities presented in this portfolio the adult has added containers, buckets, spades and other items to aid the children in their exploration. All these moveable objects, including the natural materials at the beach are known as 'loose-parts'. Loose parts play are resources natural or man-made according to Nicholson (1971, cited in Gull *et al.*, 2019) which provide opportunities to create and change and allow the children's learning and activities to be child led in any environment whilst enhancing their holistic development. Ranheim (2020) explains that these loose parts are an excellent natural material to explore mathematical concepts such as sorting, size, measurement, shape, patterns and classifying. The adults could work alongside the children to collect these natural materials which can cement their connection with nature and encourage questioning and use of mathematical language. Further to this Bruton and Thornton (2010) say that the unique properties that natural loose parts hold such as colours, shapes, smell and so much more invite children to use their scientific skills of inquiry and investigation.

Furthermore, Casey and Robertson (2016) say that the natural loose parts found at the beach or in any natural environment offer a much higher level of affordance than manmade play environments. Therefore, according to Walters (2017) it is important in

these environments the practitioner does not impart their ideas on the children about what activities can be carried out using certain parts but that they allow the children to decide this for themselves. Maudsley states that children do not view the environment to see what it has to offer but by what possibilities it offers, deriving from their natural want to play (2009, cited in Early Years Educator, 2016). Early Years Educator (2016) therefore states that it is important for adults to provide experiences in these stimulating natural environments that help children to focus on their imagination rather than playing with plastic resources which are brightly coloured as these non-inspiring resources are thought to lower attention span and limit confidence and opportunity.

However, Campbell and Speldewinde (2020) in their study found that the success of children's scientific learning that was supported by an adult depended on the scientific knowledge of the adult. Overall, they found that adults supported well but in areas of scientific experience or learning that they had little knowledge of they withdrew their support. Tinney *et al.* (2020) also found in their study on practitioners' adult- child interactions that interactions that centred around investigations and concepts were not as developed as other areas of practice. They found that this can be due to practitioners' lack of scientific knowledge and practitioners' own scientific experiences as children themselves. Tinney *et al.* found that through providing practitioners with training on how they can encourage children's scientific learning through fun and engaging activities there was a change in practitioners' perceptions and ideas about embarking on sustained shared thinking and therefore scientific learning with the children in their care.

Welsh Government (2021) state that in providing the New Curriculum practitioners will need to be knowledgeable and interested and provide environments which are exciting and engaging as this results in significant experiences. They say that children should be given the freedom of time to carry out their exploration and allowed to return to what they have done to cement and refine their skills, this should be done outdoors as well as in. This resonates with Bruner's spiral curriculum, whereby children are supported by knowledgeable adults to return to their learning to attain a deeper understanding each time which furthers their development (Conkbayir and Pascal, 2014).

However, the challenges of this are due to the fast-paced world that we live in, children do not often have the time to play freely, to explore and use their own skills to do so (Casey, 2007). Patte (no date) explains that one of the reasons for this is too much structured time into a child's day and he states that children should be allowed double the amount of free unstructured play time in comparison to structured activities for the holistic development of children and this is underpinned by article 31 of the UNCRC that states every child has the right to play freely (Unicef, 1989).

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