

BIODIVERSITY AND INTERDEPENDENCE

First Level E&O:

SCN 1-02a

Supporting E&Os:

SOC 1-08a, MNU 1-20a, MNU 1-20b, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, LIT 1-14a, HWB 1-13a, HWB 1-20a, EXA 1-12a

Big Questions:

How do we know if something is "alive"?
What do all living things depend on?

Real World Jobs:

Zoologist, Botanist, Microbiologist,
Ecologist, Veterinarian, Entomologist

Learning Intention:

We are learning to sort living things into groups and explain our decisions.
We are exploring how all living things are linked through food chains and webs.

Success Criteria:

- We can explain the difference between living things and non-living things by using movement, growth, reproduction, sensitivity, excretion and feeding.
- We can create our own criteria for sorting living things and explain our decisions.
- We can sort living things into plant, animal and other groups using key features.
- We can understand the importance of all living things on our planet and find ways to conserve them.

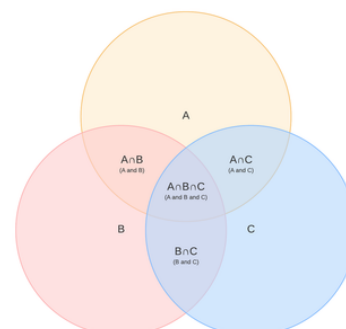
Materials:

- Picture prompts of living, non-living and once-living items (Extension: Picture prompts of plant, animal and man-made)
- 5/6 large hoops for sorting
- Key Flowchart for identifying living, non-living (<https://www.twinkl.co.uk/resource/is-it-living-or-non-living-display-poster-t-sc-460>)
- Pictorial wood-cookies/badges of simple food chain groups of producers, consumers and predators
- Blank wood-cookies, hand drills, drawing and felt pens and string

Starter Activities (20 mins):

Task the learners to use a Key Flowchart to find objects from the following categories: living, non-living and once living. You can use extended categories: plant, animal, non-living, once-living and man-made. Discuss any risks involved in picking such as spines, sharp edges, stings and hygiene. Discuss risks involved in moving around the space and looking where we are going. They may work in pairs or small groups to complete the task and return with their objects. Give a time limit and recall the learners after your given time.

Back in the circle, set up your large hoops as Venn Diagrams. Ask each group to sort and categorise their objects found into the large hoops. Use the picture prompts as labels for your hoops to support the learners. Discuss the end results as a group. Are all the objects in the right hoop? Are there any objects that could be in more than one place? Can we explain why we have placed the objects in the chosen categories?



Main Activities:

Whole Group (20 mins):

Ask the question “Where does the energy from the sun go?” Discuss how plants absorb the light energy from the sun and convert it to food energy. Plants are therefore called “producers”. Some animals then eat the food energy by eating the plant. These are called the “consumers”. Then other animals eat the animal who ate the plant. These animals are called “predators”.

Introduce a simple food chain game. Task the learners to choose a pictorial wood-cookie/badge and find their food chain team members in 1-2 minutes. Once with their team, discuss who is the “producer” of energy, the “consumer” of the energy and the “predator”. Discuss how the original energy produced becomes “less” as it travels up the food chain. The wood-cookies/badges are colour-coded for support. For example:

Red Team = Leaf Litter + Worms + Badger

Blue Team = Scot's Pine + Red Squirrel + Pine Marten

Green Team = Bramble + Dormouse + Barn Owl

Yellow Team = Rush Plant + Water Vole + Fox

Purple Team = Algae + Crab + European Otter

Orange Team = Fungi + Slug + Hedgehog

Black Team = Clover + Snail + Song Thrush

White Team = Heather + Mountain Hare + Golden Eagle

*A **food chain** is a straight path of who eats whom.*

Food chains show the feeding relationships between organisms.

*A **food web** is a large network of many connected food chains.*

Food webs show how all the food chains in an ecosystem interact.

Small Groups (40 mins):

Allow the learners to explore the natural area and choose their activities. Provide a mixture of adult-led groups and adult-initiated provocations and open-ended resources for child-led learning (see Play Provocations).

Adult-Led Activity: Make a food-chain hanging mobile using wood-cookies (tool use)

Using plain wood cookies, the learners draw a simple food chain with one living thing on each wood cookie. Then using a hand drill, they can drill a small hole in each cookie. Thread through string and make a chain in the correct order than can be hung up. If wood-cookies are unavailable, they can be substituted for cardboard circles, or paper plates.

Photo of illustrated
wood cookies hanging
in a food chain

Play Provocations:

Bug Hotels: Provide a variety of model minibeasts and natural materials for making bug hotels. These can include sticks, pinecones, brown leaves, moss, wood chips and straw.

“Living Things” Hospital: Use some broken or “injured” toy animals that need looking after in the hospital. Provide a “Hospital” sign and different “Ward” signs, using the different categories such as “Living Ward”, “Once-living Ward”, “Non-living Ward” or “Producer Ward”, “Consumer Ward” or “Predator Ward”. If possible, provide chalkboard with chalks, gauze bandages, fabric strips and trays that can be used as stretchers.

Bug Hunts: Use Identification keys and flowcharts with collecting resources such as small pots, dishes, white sheets and magnifying tools.

Plenary:

Observe, record and discuss findings and new interests in play.

Option: In their food chain teams - role play and act out the food chain story. Can they come up with another example for others to guess?

Option: Living V Non-Living Charades: act out a living or non-living thing and everyone must guess if it is living or non-living.

Story Links:

- *Uno's Garden* by Graeme Base
- *The Disgusting Sandwich* by Gareth Edwards
- *The Green Man*:
<https://loveoutdoorlearning.com/literacy/the-green-man/>

Substitute, Follow-up or Extension Activities:

- Organise a visit from your Local Ranger to talk about their job role in the environment and deliver sessions in your natural area. (DYW)
- Animal Tracking: look for tracks in your area and clues of animals visiting. Use a camera trap if you have one or ask your Local Ranger to set one up. Use a Footprint Trap to record visiting animals in your area: <https://www.nhm.ac.uk/discover/how-to-make-a-footprint-tunnel.html>
- Identify Native and Non-Native classifications and species. Become an Alien Detective: <https://invasivespecies.scot/wp-content/uploads/2025/04/1.1-Introduction-presentation.pdf>
- Investigate the impact of non-native species on food webs and the environment. Play the Non-Native game: https://invasivespecies.scot/wp-content/uploads/2025/04/3.4-Impact-of-Mink_0.pdf
- Classroom tank habitat with minibeasts such as earthworms, woodlice, snails to observe behaviours and care for.
- Conservation activities - Litter-picking, tree planting, upcycled bird feeders and bug hotels

PLANTS

First Level E&O:

SCN 1-03a

Supporting E&Os:

SOC 1-08a, SOC 1-13b, SOC 1-14a, MNU 1-01c, MNU 1-20a, MNU 1-20b, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-14a, HWB 1-13a, HWB 1-20a, EXA 1-04a

Big Questions:

How do we care for a plant?
Why are there different types of plant?

Real World Jobs:

Botanist, Ecologist, Horticulturalist,
Gardener, Farmer, Florist, Forestry

Learning Intention:

We are learning about what plants need.

Success Criteria:

- We can create an experiment to grow plants in different conditions using light, water, air, soil and heat.
- We can observe and measure the outcomes of our experiment.
- We can create a report or presentation to present our findings on how plants grow.

Materials:

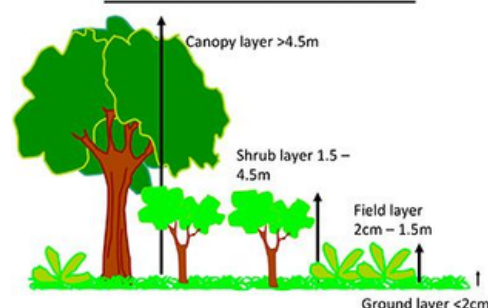
- Pre-prepared A4 card stock with four horizontal strips of double sided tape stuck across the card for each learner
- Plant and tree ID charts
- Collected tree seeds such as acorns or hazel nuts (try to collect only one type of tree seed for the experiment)
- 8 empty pots/upcycled cartons for planting
- Compost/soil

Starter Activities (20 mins):

Introduce to the group that we can look at our environment as different levels or layers to explore. Our feet are on the "Ground Layer". From the Ground to our shoulders is the "Field Layer". From our shoulders to about the top of tree trunks where branches start is the "Shrub Layer". Where tree branches start and the foliage of trees mostly begin and higher is the "Canopy Layer".

We are going to explore the different layers by collecting samples on a Sample Board, A Sample Board (piece of card) will have four horizontal strips of double sided tape running across the card. Each strip of double sided tape represents each of the layers: Ground, Field, Shrub and Canopy. The learners will explore their area by collecting small samples of plants to stick on the appropriate layer on their Sample Board. They can extend this by using identification charts to ID their plant/tree sample and labelling them on their Sample Boards,

Structure of a Woodland.



Main Activities:**Whole group (10 mins):**

Discuss how trees have grown in the area. Are all of them tall? Are some shorter than others? Why could there be different sizes and heights of tree? Are all of the trees the same species or are they different? Are some trees more important than others?

We are going to create an experiment on your site by planting native tree seeds in upcycled cartons or pots. You can collect your own tree seeds in Autumn such as acorns or hazel nuts (<https://www.norfolkwildlifetrust.org.uk/sites/default/files/2024-03/Trees%20from%20seeds.pdf>). Try to only collect and use one type of tree seed for this experiment.

Some background information about the different types of trees found in Scotland and their uses: <https://treesforlife.org.uk/into-the-forest/trees-plants-animals/trees/>

Small Groups (30 mins):

Allow the learners to explore the natural area and choose their activities. Provide a mixture of adult-led groups and adult-initiated provocations and open-ended resources for child-led learning (see Play Provocations).

Adult-Led Activity: Planting seeds and placing in different conditions

In small groups, plant a couple tree seeds in each pot or upcycled carton. Place each pot/carton in different conditions: two without light, two without water, two without air, two without soil. Ask the learners how we should present the findings over time. Could we present them using charts, posters, photographs or drawings?

Observe and monitor over several weeks and record observations. Allow the learners to present their findings at the end of the experiment.

Please note: Trees are slow growers and using tree seeds emphasises this and the importance of why protecting our trees is vital as replacing them is not “a quick fix”. If you do need a quicker alternative use a wildflower seed instead such as Red Clover or Yellow Rattle.

Photos of native tree seeds
planted in pots under
different conditions

Play Provocations:

Artist Inspiration: Andy Goldsworthy - using photo prompts of Andy Goldsworthy's artworks in nature, allow learners to create their own artwork using nature on site.

Hapa Zome: Provide hammering tools (hammers, stones, small logs), scraps of plain white fabric (cut up bed linen works well), and planks of wood or solid surface to work on. Hapa Zome is the art of hammering plant material onto fabric to "print" the natural dyes within the plant material.

Plant Shop Role Play: Provide empty pots and containers, chalk boards and chalk, trays and planks that could be used for shelves.

Plenary:

Observe, record and discuss findings and new interests in play.

Discuss with the learners the results of the planting and what worked and did not work. Explain to the learners that we controlled the conditions for these plants but ask what can affect these conditions in nature?

Story Links:

- *Wangari's Trees of Peace: A True Story from Africa* by Jeanette Winter
- *The Oak Tree* by Julia Donaldson
- *Tree Stories:*
https://owlsotland.org/resources/tree_stories/

Substitute, Follow-up or Extension Activities:

- Tree Cycles: Looking at identifying the different lifecycle stages of native trees in Scotland. Identifying the different trees from seed, shoots, buds, leaves, twigs, flower and bark throughout the seasons. Creating a timeline from seed to tree.
<https://www.woodlandtrust.org.uk/blog/2019/06/tree-lifecycle/>
- Leaf Slides: Use cardboard window frames and stick different leaves within the windows so that you can hold the window frame up to the light and observe the leaf structure in more detail.
- Tree Measuring: Learn how to estimate and measure the height and age of a tree using a variety of techniques - <https://owlsotland.org/resources/tree-measuring1/>
- Halloween STEM: Read the story *Pumpkin Jack* by Will Hubbell. Carve and keep a pumpkin over the year. Make sure you keep some seeds with it. You can either keep it in a tank in class, in a flower bed or polytunnel. Allow the learners to observe and record the pumpkin rotting, decomposing and re-growing over the year.

WATER

First Level E&O:

SCN 1-05a

Supporting E&Os:

SOC 1-08a, SOC 1-14a, MNU 1-01c, MNU 1-20a, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, HWB 1-09a, HWB 1-13a, HWB 1-20a, EXA 1-04a, EXA 1-13a

Big Questions:

How many times do you think water can be recycled?
Who drank our water before us? Who will drink our water after us?

Real World Jobs:

Water Engineer, Meteorologist,
Water Technician, Farmer,
Gardener, Ecologist

Learning Intention:

We are learning about the water cycle.

Success Criteria:

- We can find out at what temperature water boils, freezes and melts through experiments.
- We can use the appropriate units of measure to describe temperature.
- We can use the terms "evaporation" and "condensation".
- We know that (pure) water boils at 100C, melts at 0C and freezes at 0C.

Materials:

- Bucket (3 quarters filled with water)
- Photos of different stages of the water cycle: steam rising (evaporation), clouds forming (condensation), rain falling (precipitation), lakes and oceans (collection).
- A large bowl
- A flask of hot boiled water
- Cling film
- Ice cubes
- Various dishes/containers
- Thermometers
- Timers
- Paper and pencils for recording data

Starter Activities (10 mins):

Ask the learners: how much water do we have available to us in the world? take note of any answers and then use this visual model to re-discuss and explain.:

- Fill a bucket 3 quarters full of water. The whole bucket represents the Earth. The water represents how much water is present on Earth.
- Cup your hands and scoop up some of the water. This is how much water is FRESH WATER on Earth,
- Let the water in your hands drop back into the bucket. The water left on your hands represents the amount of CLEAN WATER available to humans.

The approximate percentages are:

97% salt water

2% fresh water

1% clean water for all of our human needs

Main Activities:

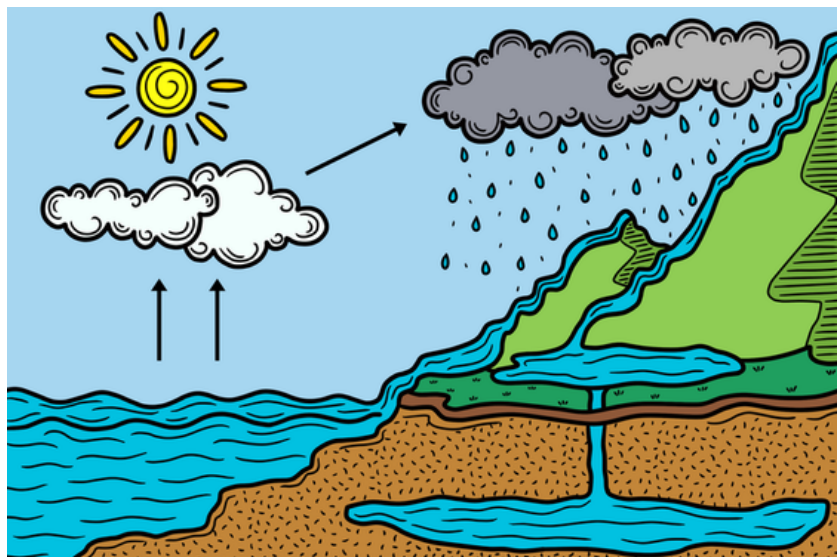
Whole group (15 mins):

Ask the learners: Did you know the water we drink is the same water that dinosaurs drank over 200 million years ago?!

We collect water from the Water Cycle for our human use. What is the Water Cycle? Use the learners responses, ideas, answers and photo prompts to discuss the processes of the Water Cycle: evaporation, condensation, precipitation and collection. What naturally heats the water up to evaporate? What cools the water down to condensation?

- Demonstrate using a large bowl. Pour hot water from a flask into the bowl. Explain that water boils at 100C, however this water is now not boiling anymore so it is less than 100C. We should still be able to see steam coming from the bowl, therefore water can evaporate from hot or warm water that is not boiling hot.
- Cover the bowl with cling film. If it is a cooler day, you should immediately see the water condensing on the cling film. You can speed up this process by placing an ice cube on top of the cling film surface. Show the learners that by cooling the water we are condensing it. When more water condenses it increases in volume and weight and then starts to drip back down, just like when clouds become more dense and heavy with moisture, they will eventually pour rain. The rain then collects in lakes and oceans and the cycle continues.

Empty the hot water out and use air/room temperature water in the bowl. Recover with cling film and leave in a sunny location to demonstrate the simple and natural heat of the sun.



Small Groups (30 mins)

Allow the learners to explore the natural area and choose their activities. Provide a mixture of adult-led groups and adult-initiated provocations and open-ended resources for child-led learning (see Play Provocations).

Adult-Led Activity: Measuring temperature using units

Using various dishes or containers of water or ice cubes, place in different locations around your site - for example, in shade, in full sun, in partial shade, on a natural surface, on a man-made surface. Measure the temperature of the water/ice at the start. Return after 10 minutes intervals and record the temperature again. Note any observations and changes. The learners can use timers to keep track of their 10 minute intervals whilst at play in between recordings.

Play Provocations:

Terrarium Bottles: Make and plant a terrarium inside a plastic bottle. The terrarium demonstrates how the water cycle provides for an ecosystem -

<https://cubscoutideas.com/2447/how-to-make-a-terrarium/>

Water Play: Provide a variety of buckets, containers, bottles, tubes, funnels, jugs, ladles and sponges with water/snow/ice.

Water Colours: Provide water colour paints, paper and brushes. Notice the evaporation process as paintings dry.

Plenary:

Observe, record and discuss findings and new interests in play.

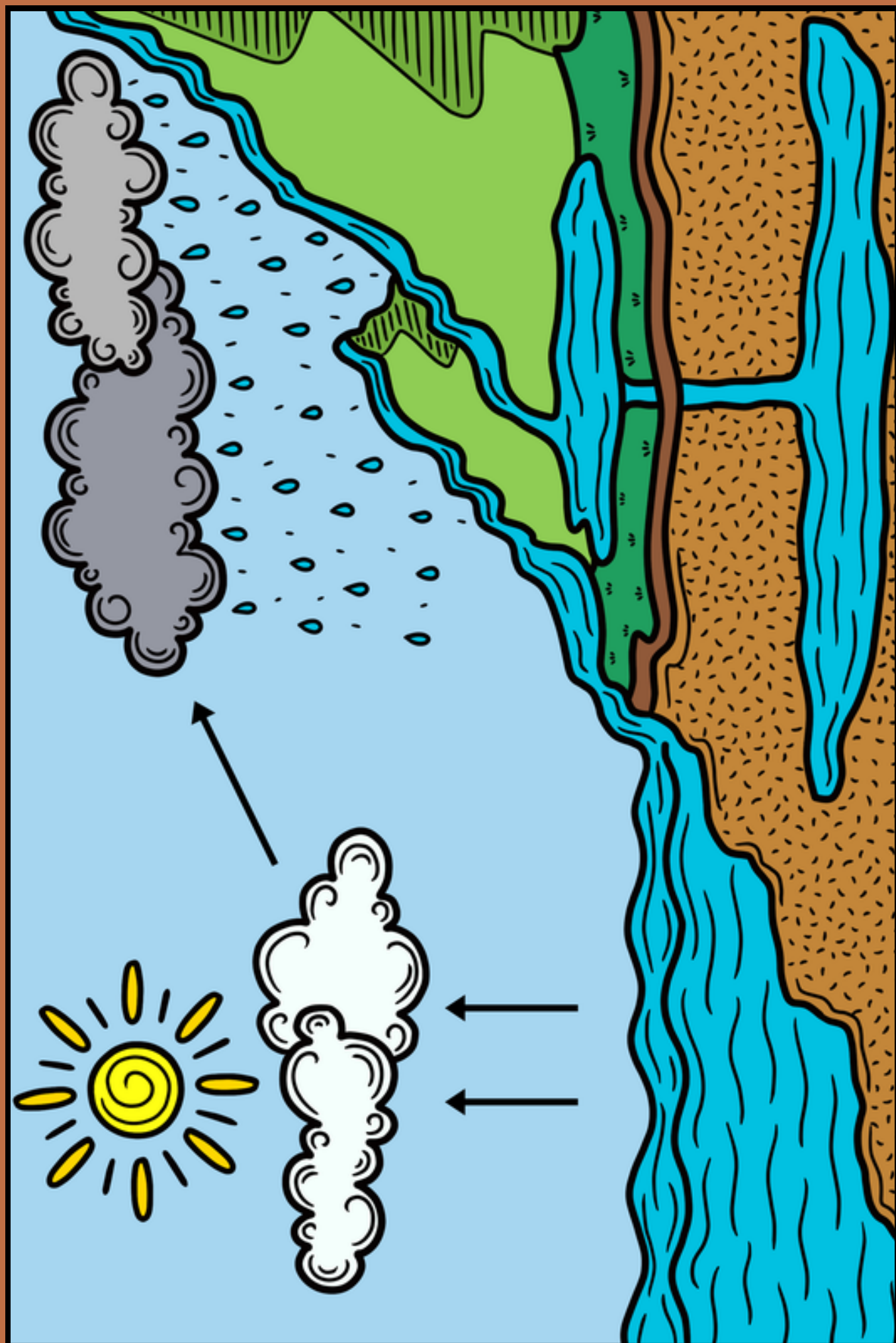
Return to the bowl of water you placed out in a sunny location. Notice and discuss how much water has evaporated and condensed just from the heat of the sun.

Story Links:

- *We Are Water Protectors* by Carole Lindstrom
- *A River* by Marc Martin
- *The Water Hole* by Graeme Base
- *The Rhythm of the Rain* by Grahame Baker-Smith
- *Once Upon a Raindrop: The Story of Water* by James Carter

Substitute, Follow-up or Extension Activities:

- Water painting on tarmac/paving and draw around with chalk. Observe the evaporation process leaving just the chalk lines behind. Snow/ice painting in sketchbooks with paint.
- ECO Schools Saving Water campaigning
- Water Cycle Quiz: <https://www.scottishwater.co.uk/Help-and-Resources/Document-Hub/Careers-and-Education/Water-Cycle-Education-Pack>
- Tree of Life: Role play the structure of a tree trunk and how water travels up and down the capillaries. 2 children stand still in the middle as the Heartwood (core) of the tree trunk. 4-5 children stand around the Heartwood in a circle facing outwards. They are the Sapwood and must swish their arms up and down to demonstrate water moving up the tree from the roots. Another group of children stand in a circle around the Sapwood, holding hands and facing inwards. They are the protective Bark. Any remaining children can form the Roots lying down on the ground with their feet towards the Bark. The Root children can swish their arms to show the roots taking up water from the ground to the Sapwood.



SOUND

First Level E&O:

SCN 1-11a

Supporting E&Os:

TCH 1-09a, TCH 1-10a, SOC 1-14a, MNU 1-20b, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, LIT 1-14a, HWB 1-20a, EXA 1-04a

Big Questions:

How do we hear and control sound?
What is the importance of sound?

Real World Jobs:

Sound Engineer, Musician, Sound Designer, Audio Visual Technician, Production Engineer, Composer

Learning Intention:

We are learning about sound.

Success Criteria:

- We can demonstrate how sounds can be made higher or lower pitch by altering tightness, length, width or thickness or other physical characteristics of the sound source.
- We can explain that sound is caused by vibrations in a material.

Materials:

- Bowl of water and a pebble/stone
- Sit Spot Map template
- Different sized tubs, bowls, tins, boxes, containers
- Different sizes and thickness of elastic bands that can fit over some of the containers and tubs
- Empty lidded cartons, tins, or cardboard tubes.
- Sturdy paper and craft paper
- Adhesive tape
- Marker pens or paints with brushes
- Colourful yarn
- Plastic and/or metal bottle tops (6-8 each)
- Sticks (collected or cut if sustainable)
- Small tacks, 2-3 cm long with a flat head
- 1 larger nail, with a diameter slightly bigger than the tacks
- Hammer

Starter Activities (10 mins):

Ask the learners how does the sound of our voices travel to be heard? Discuss their answers and ideas. Demonstrate using a pebble dropped in a water bowl how sound travels as waves lengths of vibration much like the ripples in the water.

Using a tub with different thicknesses of elastic bands, demonstrate how you can alter the pitch of sound higher and lower. Thinner elastic bands will create a higher pitch. Thicker elastic bands will create a lower pitch. You can also demonstrate how hitting two thinner sticks together creates a higher pitch compared to hitting two thicker sticks together.



Starter Activities (Cont.):

Ask the learners to place two fingers on their neck close to where their vocal chords are at the very back of our throats. Tell them to make a humming sound and notice what they feel with their fingers. Our voice box or “larynx” works by having two bands of smooth muscle called “vocal cords”. These vocal cords vibrate when air passes through them creating sound. These sound waves then travel into our ears where they bounce onto our “ear drum” inside our ears creating vibrations. These vibrations are then turned into electrical signals which are sent to our brains to tell us what we have heard.

Main Activities:

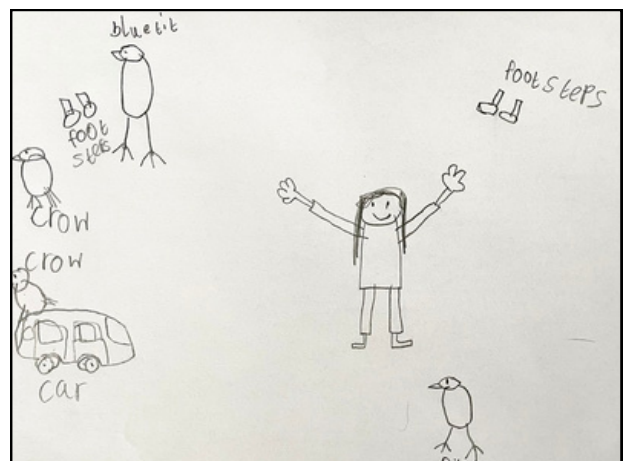
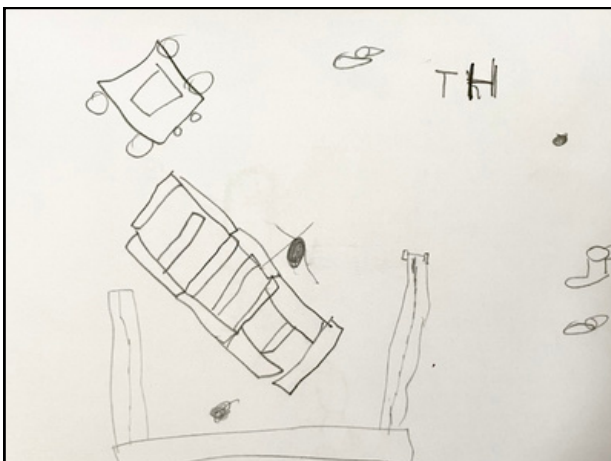
Whole group (15 mins):

Task the learners to find a “sit spot”. This is a spot on your site where they will spend 5-10 minutes sitting, listening and recording what they hear. It is important that the learners understand that this activity needs them to be quiet like “silent snails” so that they can use their listening skills to hear as many sounds as possible.

Once they have found their “sit spot”, they will record what they hear on a “sound map” (see Sound Map template). Sounds that they hear close by, they will draw or write in the inner circles towards the direction of the sound. Sounds that they think are further away, they will write or draw in the outer circles towards the direction of the sound. Some learners will find having a sense of direction and distance trickier than some others and may find it helpful to close their eyes and point towards the sound first, before recording it on their maps.

Return together and compare results. How many sounds did everyone hear? Were all the sounds natural? Were any sounds human-made? Were there any sounds of living things? Were there any sounds from non-living things? Which sound seemed furthest away? Which sound seemed closest?

Higher pitch sounds have shorter wavelengths and use more energy to travel. Lower pitch sounds have longer wavelengths and use less energy to travel, therefore they can usually travel longer distances. Does this relate to the sounds we have heard and recorded on our maps?



Main Activities (Cont.):

Small Groups (30 mins)

Allow the learners to explore the natural area and choose their activities. Provide a mixture of adult-led groups and adult-initiated provocations and open-ended resources for child-led learning (see Play Provocations).

Adult-Led Activity: Making Music Instruments

You can choose which instruments you want to make depending on your resources:

Shakers (Page 25 - <https://owlsotland.org/resources/music-in-the-woods/>)

Using lidded containers or cardboard tubes. Fill your container half way, with a variety of natural materials such as seeds, leaves, small sticks, stones and cones. Seal the container with the lid and tape to secure. If using cardboard tubes, seal both ends with paper and tape. Cover the container with paper and secure with tape. Decorate with pens or paint and enjoy!

Stick Jingles (Page 17 - <https://owlsotland.org/resources/music-in-the-woods/>)

Use a flat log or chopping board as a surface for hammering onto. Using the large nail and hammer, hammer a hole into each of the bottle tops. Choose 6-8 bottle tops and a sturdy stick. Using the smaller tacks, hammer two bottle tops back-to-back onto one end of the stick. You don't want to hammer the tack too deep as you want the bottle tops to be able to move about and jiggle. Continue hammering the rest of the bottle tops in pairs evenly around the stick. Decorate the handle of your stick jingle with some coloured yarn or paint.

Photos of instruments

Play Provocations:

Jar Xylophones: have a variety of different sized jars. These can be filled with water, or natural materials like leaves, mud, stones, sand and/or cones. Use chopsticks to “play” the jars to reduce the risk of breaking the glass. Allow the learners to experiment with the different jars and materials and the effect on the pitch of the sounds produced.

Provide a variety of boxes, tins and containers with elastic bands, straps, bungee cord and strings to make instruments.

Provide some postal tubes cut to different lengths and sizes to use as “boom sticks”.

Plenary:

Observe, record and discuss findings and new interests in play.

Showcase and share the instruments everyone has made.
Create a performance!

Story Links:

- *The Sound Collector* (animated series narrated by Keira Knightley available at <https://www.youtube.com/@thesoundcollectorTV>)
- *The Sound Collector* poem by Roger McGough
- *Wild Languages of Mother Nature* by Gabby Dawney

Substitute, Follow-up or Extension Activities:

- Create more instruments from Music in the Woods by OWL Scotland - <https://owlsotland.org/resources/music-in-the-woods/>
- Mystery Sound Boxes: hide different natural and human-made objects in some small boxes or lidded tubs. Can we guess what is making the sounds?
- Micro:bit Sound Meters: using BBC Micro:bits and the built in sound meters can we record the volume of sounds in different locations of our site.
- String and Cup Telephones: can we make a string and cup telephone and do they actually work? What happens when we shout or whisper down the telephone? What happens if we add another telephone to the line? What happens if we use different types of string?

Sound Map

ME

Name: -----

THE SENSES

First Level E&O:

SCN 1-12b

Supporting E&Os:

SOC 1-14a, MTH 1-17a, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, LIT 1-14a, HWB 1-09a, HWB 1-13b, HWB 1-15a, HWB 1-16a, HWB 1-20a, EXA 1-04a

Big Questions:

What is the importance of our senses?
What happens when there is a barrier to one of our senses?

Real World Jobs:

Police, Military, Sommelier,
Masseuse, Textile Designer, Food
Critic, Chef, Surgeon, Pilot

Learning Intention:

We are learning about our senses.

Success Criteria:

- We can use our senses to detect information around us.
- We can explain how our senses keep us safe.
- We can explore the reliability and limitations of our senses and discuss impact.

Materials:

- A variety of adjectives written onto slips of paper or flash cards
- Blindfolds (optional)
- Long length of rope or a selection of sticks/stones
- Oats
- Ear bands or ear defenders (optional)
- Stuffed animal toy

Starter Activities (10 mins):

Task the learners to go on a Adjective Scavenger Hunt. Write a selection of adjectives onto slips of paper. For example: hard, soft, sticky, squishy, stripy, rough, smooth, cold, wet, dry, strong, straight, bendy, twisty, hairy, fuzzy, spotty, smelly, yellow, brown, green, pink, crunchy, sloshy, feathery, crackly, fresh.

Give each learner or pair, an adjective and they must find 2 different natural objects to go with their word. Set a time limit of 3 minutes to find their objects and then regather to look at and discuss what everyone has found. How did we use how senses to select the objects? Did we use touch, smell, sight or hearing? Can any of our objects go with someone else's word as well as our own word? For example: Sweet Cicely leaves are green and feathery but smell like liquorice.

Main Activities:

Whole group (20 mins):

Choose from the following activities to suit your site and needs:

Blind Walk (trees and rope)

Set up a couple rope obstacles by making rope trails through your trees. Make sure that you have assessed the risks of each course, The rope should be at waist or chest height for your learners and involve leading them through some obstacles. Explain the risks to your groups. Provide blindfolds and explain that each group is going to follow the rope. They will need to feel the rope and stay in contact with the rope at all times. They will follow the rope to the end wearing a blindfold. To reduce the level of difficulty, you can pair up the learners so that only one is blindfolded whilst the other is the “guide”, who helps them by giving instructions. You can also remove the use of blindfolds and just have them close their eyes.

Meet a Tree (no ropes)

In pairs, one learner has their eyes closed or blindfolded. The other learner must choose and “guide” their “blind” partner to a tree or bush. The “blind” partner must feel the tree or bush and try and remember the details of what it feels like, building a picture in their minds. The “guide” must make sure the “blind” partner does not get injured by the tree/bush in the process. Once the “blind” partner has had enough of feeling the tree/bush, the “guide” must guide them back to their starting position and spin them gently 3 times. The “blind” partner can now open their eyes or remove their blindfold and they must try to identify the tree/bush that they visited.

Meet a Stick/Rock (no trees)

Similar to Meet a Tree except using a choice of 3 objects (sticks or stones). The “guide” chooses one of the 3 objects for the “blind” to feel. The object is then returned to the group of 3 and when the “blind” has removed their blindfold or opened their eyes, they must guess which of the 3 objects it was that they had felt.

Questions to discuss at the end: How did it go? Did they help each other? What was harder or easier without sight? How did we stay safe?

Small Groups (30 mins)

Allow the learners to explore the natural area and choose their activities. Provide a mixture of adult-led groups and adult-initiated provocations and open-ended resources for child-led learning (see Play Provocations).

Adult-Led Activity: Tracking Walk

Set up a tracking trail with oats. Hide a stuffed toy animal on your site and create a trail of oats from your animal to a designated starting point. To increase difficulty, reduce the amount of oats you use in some areas of your trail and increase the amount of oats in other parts. The learners must take turns in small groups to start at the beginning of the trail and follow it to find the animal. You may wish to place this activity slightly further away from the main groups at play so that the discovery of the animal is not obvious to the next groups that follow. To increase difficulty, reduce one of the senses such as hearing using ear bands or defenders.

Questions to discuss at the end: How did it go? Did they help each other? What was harder or easier with hearing limited? How did we stay safe?

Play Provocations:

Artist Inspiration - Andy Goldsworthy: Making artwork using natural materials and finds. Provide photo prompts of Andy Goldsworthy's artworks to inspire the learners.

Clay Nature Prints: Provide clay and natural finds to make imprints and patterns in the clay. These can be made into tiles, pinch pots or saucers.

Provide paper and wax crayons/oil pastels for leaf and bark rubbings

Provide a variety of containers and water for a Potion Making Station. You can include natural food dyes and utensils.

Plenary:

Observe, record and discuss findings and new interests in play.

Discuss the impact of limiting our senses such as sight and hearing. How does it impact our actions and safety?

Story Links:

- *Mole's Sunrise* by Jeanne Willis
- *Good-night Owl!* by Pat Hutchins
- *Arlo: The Lion Who Couldn't Sleep* by Catherine Rayner
- *The Detective Dog* by Julia Donaldson
- *I Can Eat a Rainbow* by Olena Rose

Substitute, Follow-up or Extension Activities:

- A Wolf in Sheep's Clothing Game: Have a piece of cloth for each learner to tuck or pin onto themselves so that it is still clearly visible. Three of the pieces of cloth have been sprayed with a safe perfume or essential oil. The learners with the 3 "smelly" cloths are the "wolves". The rest are the flock of "sheep". The learners must sniff out the "wolves" hidden amongst the flock of "sheep" by trying to sniff the cloths to find the three perfumed ones.
- Senses Counting Poem: Write a 1-5 poem involving the senses and counting. Use the structure - I **hear one** singing bird. I **taste two** wild raspberries. I **feel three** fuzzy leaves. I **see four** wild children. I **smell five** woody sticks.
- Sensory Poem: Write a 5 line poem using all 5 senses and adjectives. Learners choose a sit spot to look and listen to their surroundings. Use the structure - I <sense> a <adjective> <noun> <verb>. For example: I hear a lonely sparrow twittering. Complete for all 5 senses into a journal or sketchbook and illustrate it.
- Haiku Poem: Write 3 lines using the syllable structure 5-7-5 and the senses. Example:

*I see flower clouds,
Floating on tips of green fronds,
Where I can rest calm.*

WEATHER

First Level E&O:

SOC 1-12a

Supporting E&Os:

SOC 1-08a, SOC 1-14a, MNU 1-01c, MNU 1-20a, MNU 1-20b, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, HWB 1-13a, HWB 1-20a, EXA 1-04a, EXA 1-06a

Big Questions:

Why are forecasts important?
How does our weather effect our climate?

Real World Jobs:

Meteorologist, Fishermen, Sailor,
Farmer, Firefighter, Windfarm
Engineer, Pilot

Learning Intention:

We are learning to measure and record weather.

Success Criteria:

- We can use instruments to measure and record at least two different weather elements (temperature, rainfall, wind direction).
- We can discuss our opinions on how weather affects living things.

Materials:

Precipitation Gauge

- 5 large plastic bottles with lids
- 1 small plastic bottle with lid
- 5 small plastic yoghurt pots
- 2 wooden barbeque skewers
- Plastic carrier bag
- Ruler
- Permanent marker pens
- Duct tape
- Sellotape
- Scissors
- Hole puncher
- Drawing pins/tacks
- String
- Plastic straw
- Modelling clay
- Rubbing alcohol
- Water
- Food colouring
- A variety of thermometers
- Cloud viewers: <https://www.metlink.org/wp-content/uploads/2020/11/cloudwheel.pdf>

Starter Activities (10 mins):

Discuss with the learners all the different ways we can find out about the weather such as TV reports, online reports, social media, apps, gauges and even looking out of the window or standing outside. Ask the learners, what does the term “forecasting” mean?

Forecasting: means to predict or calculate what is likely to happen in the future, usually as a result of looking at the data or information available.

Discuss with the learners: Are weather forecasting reports always accurate? Can we design some ways to record the weather and compare to the local weather reports?

Main Activities:**Small groups (30 mins):**

In small groups, allocate a each group different weather type to measure and record. Each group should be given the resources to help them create a method to measure and record the weather type given.

Precipitation Group

Make a rain gauge and use cloud viewers to record the cloud shapes and measure precipitation.

VIDEO - How to make a rain gauge: <https://youtu.be/Rh18GMwwV4M>

1. Cut a large plastic bottle about two thirds up so that you are separating the funnel part from the main bottle.
2. Place a vertical strip of duct tape on the main part of the bottle.
3. Mark on the duct tape a scale using a ruler and permanent pen. Where the bottle stops curving at the bottom make that the starting level at 0.
4. Turn the funnel part of the bottle that's been cut off, upside down and place in the top of the main part of the bottle so that water is funnelled into the bottle. Secure in place with duct tape.
5. Fill the bottle with water up to the starting level 0.
6. Place in an open location and record measurements regularly.
7. Use cloud viewers to record the cloud shapes together with precipitation levels:
<https://www.metlink.org/wp-content/uploads/2020/11/cloudwheel.pdf>

Photos of rain gauge,
anemometer, wind sock and
bottle thermometer

Wind Group

Make an anemometer to record wind speed and a wind sock to record wind direction.

VIDEOS -

How to make an anemometer: <https://youtu.be/Lhp944IrRcY>

How to make a wind sock: <https://youtu.be/kiU3ZBJeqU0>

- 1.Fill a large bottle with some water to give it weight for stabilisation and close with the lid on.
- 2.With a drawing pin/tack, poke 4 holes into the side of one yoghurt pot evenly spaced apart.
- 3.Poke 2 holes into the side of the 4 remaining yoghurt pots evenly spaced apart.
- 4.The yoghurt pot with 4 holes is the centre piece. Place the wooden barbeque skewers through the holes so that they form a cross with the yoghurt pot in the centre.
- 5.At each end of the skewers, and using the 2 holes, place each remaining yoghurt pot so that each yoghurt pot is pointing in the same direction. Secure with tape.
- 6.Using a drawing pin/tack, pin the bottom of the central yogurt pot to the lid on top of the bottle. Check that the pots spin easily on top of the bottle.
- 7.Place in a open location and record the number of spins in 1 minute. You may want to add coloured tape to one of the yoghurt pots and use it as a count marker.

- 1.Cut the top and bottom off a large plastic bottle to create a plastic ring.
- 2.Using the hole puncher, punch holes around the plastic ring evenly spaced apart.
- 3.Cut the plastic carrier bag into streamer strips.
- 4.Fold each carrier bag streamer into half and thread the loop through a hole in the plastic ring. Thread the ends through the hoop so that the streamer is secure. Repeat for all the punched holes on the plastic ring.
- 5.Hole punch two holes at the opposite end of the streamers on the plastic ring evenly spaced apart. Attach string so that the wind sock can be hung up.
- 6.Hang in a open location and watch which way the wind blows the streamers.
- 7.Record the direction of the wind.

Temperature Group

Make a bottle thermometer and measure temperature with ready-made thermometers.

VIDEO - How to make a bottle thermometer: <https://youtu.be/oMQSaipYWiM>

- 1.Fill a small plastic bottle with half water and half rubbing alcohol. Add food colouring to colour the liquid and make it more visible. Seal with the lid.
- 2.Using permanent marker and ruler, mark regular lines on the straw and number the lines in order.
- 3.Punch a hole in the lid of the plastic bottle and thread the straw through so that it is half in the liquid and half out the bottle.
- 4.Use modelling clay to secure the straw at the lid of the bottle.
- 5.Place the bottle in a secure location where you want to record temperature.
- 6.Record at which starting number the liquid inside the straw is at. Record regularly which number the liquid moves to. The liquid should rise when warm as it expands and fall when cold as it contracts.

Play Provocations:

Small world play - Creating different climate zones using natural found materials. Use photo prompts of different climate zones such as a desert landscape, a tropical rainforest, and an arctic landscape. Provide some small world animals for each habitat type such as camels, tigers and polar bears.

Water play - Provide a variety of buckets, containers, bottles, tubes, funnels, jugs, ladles and sponges with water/snow/ice.

Weather reporter - Hang up a large map of the UK (can be hand drawn). Provide a variety of weather symbols that can be stuck onto the map. Invite the learners to perform their own weather reports.

Plenary:

Observe, record and discuss findings and new interests in play.

Present the recorded weather findings and discuss their accuracy against the local weather reports.

Story Links:

- *Where Do They Go When It Rains?* by Gerda Muller
- *The Wind Blew* by Pat Hutchins
- *One Snowy Night* by Nick Butterworth
- *After the Storm* by Nick Butterworth
- *The Little Raindrop* by Joanna Gray

Substitute, Follow-up or Extension Activities:

- Study how weather forecasts are made in more detail:
<https://www.bbc.co.uk/newsround/videos/cn81k3gd180o>
- Study how the weather affects living things around us. Observe pine cones, plants and minibeasts. Record daily and weekly data. How does a pine cone react on different days according to the weather? How do plants change with the weather? How many minibeasts and what types do we find on the surface of the ground during different weather types? We can use a hoop on the same spot to survey and record.

MATERIALS

First Level E&O:

SCN 1-15a

Supporting E&Os:

SOC 1-08a, TCH 1-02a, TCH 1-09a, TCH 1-10a, MNU 1-20a, MNU 1-20b, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, HWB 1-20a, EXA 1-04a, EXA 1-06a

Big Questions:

Are some materials better than others to use?
Are there materials for any use?
How are materials made or found?

Real World Jobs:

Engineer, Builder, Textile Designer,
Fashion Designer, Furniture Maker,
Interior Designer, Surgeon

Learning Intention:

We are learning about using different materials.

Success Criteria:

- We can sort materials into natural and human-made (synthetic).
- We can identify the properties of different materials (rigidity, flexibility, rough, smooth and waterproof).
- We can link the properties of materials to their appropriate use.

Materials:

- A variety of objects made from natural and human-made materials (synthetic). Need about 15-20 objects.
- 2 hula hoops
- Natural materials for building: sticks, large leaves, stones, pine cones, shells, wool
- Human-made materials for building: plastic tubs/containers, string, Duplo bricks, small pieces of tarp, fabric, plastic pegs

Photos materials sorted into
hoops

Starter Activities (10 mins):

Have a variety of objects on display in the centre of the circle. The objects need to be made from a range of materials that are natural and human-made (synthetic). Place two hoops on the ground near the objects. Allow the learners to discuss which objects are made from natural materials and which are made from synthetic materials. Group them using the hoops. Any objects made from both can be placed outside of the hoops. This activity can be differentiated by using different properties such as look and feel. For example, hard and soft, light and dark, rough and smooth.

Main Activities:**Whole Group (10 mins):**

Pair up the learners and ask one of each pair to seat themselves so that they cannot see the groups of objects that have been sorted in the hoops. The other pair will now secretly take one object from the hoops and hide it behind their back so their partner cannot see it. The partner must guess the object by only asking Yes-No questions about the objects properties. For example, is the object made from natural materials? Is the object flexible? Is the object soft? Is the object made from wood? Encourage the use of scientific language such as wood, plastic, bendy, stretchy, rough etc. You can allow them to ask 3-5 questions only or as many as it takes.

Small Groups (20 mins):

Challenge the groups to build using a variety of found and provided materials:

1. A small raft/boat
2. A small den
3. A fairy house

Extend the challenge by getting the groups to build 2 small “houses” - one made from only natural materials and one made from only human-made materials. Compare and contrast the builds. Discuss the pros and cons of the materials in each build.

Play Provocations:

Mud kitchen equipment - ladles, baking trays, pots and pans, whisks, metal bowls

Clay for clay play and creativity

Den building resources and materials - tarps, pegs, bungee cords, ropes

Plenary:

Observe, record and discuss findings and new interests in play.

Revisit a smaller selection of the group of objects sorted at the start and play “Odd One Out”. The learners have to choose which they think is the odd-one-out and justify their answer.

Story Links:

- *Stanley's Stick* by John Hegley
- *Otto's Ocean* by Emily Hobson-Martin
- *Eco-Wolf and the Three Pigs* by Laurence Anholt:

<https://drive.google.com/drive/folders/1RMGfCnmvYHDsw7UqnHAaQdq6YlvoqhMR>

Substitute, Follow-up or Extension Activities:

- Investigations using opaque and transparent materials, waterproof and non-waterproof materials, absorbent and non-absorbent materials. Predict the property of each material and test it out. Explain the differences in the materials and the possible potential uses of each material.
- Waterproof Challenge: create 3 stick houses with roofs made from 3 different materials. Which has the most waterproof roof?
- Decomposition Rates: Litter picking starter activity. Look at the various materials found and discuss. Create a timeline of decomposition rates and discuss the impact of rubbish and landfill. Create a litter campaign.
- Materials Salad Game: like fruit salad game but using names of materials instead.

LIFE CYCLES

First Level E&O:

HWB 1-50a

Supporting E&Os:

SOC 1-08a, MNU 1-01c, MNU 1-20a, MNU 1-20b, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, LIT 1-14a, HWB 1-20a, EXA 1-04a, EXA 1-13a

Big Questions:

Do all living things share the same needs?
What do all living things have in common?

Real World Jobs:

Biologist, Farmer, Vet, Tree Surgeon,
Botanist, Doctor, Ranger,
Conservationist, Health Visitor

Learning Intention:

We are learning about lifecycles.

Success Criteria:

- We can explain how a living thing changes at different stages of life.
- We can identify what animals, plants and humans need to grow and develop.

Materials:

- Lifecycle Badges - each lifecycle stage made into a badge that the children can wear or carry for:

Starter Activities (15 mins):

Give everyone a Lifecycle Badge that has one stage of a life cycle on it. The different life cycle groups can be colour coded to make it easier to identify each group of stages. The children now need to find the rest of their group to complete the life cycle that matches their badge. Once everyone has found their group, they need to order themselves in the correct order of the life cycle. Nominate one person from each group to describe their life cycle.

Photos

Main Activities:

Whole Group (20 mins):

Role play the lifecycle of a frog:

1. Spawn - everyone starts as a group, all curled up like a ball.
2. Hatching - everyone slowly starts to uncurl and stand up.
3. Tadpole - each learner moves about with their feet together and arms at their side.
4. Back Legs Develop - each learner shakes their legs and start to move about with their legs apart.
5. Front Legs Develop - each learner shakes their arms from the elbows down only and moves about.
6. Lungs Develop - everyone puffs their cheeks in and out as they move around.
7. Frog - everyone hops around on all four limbs, puffing cheeks in and out.

Gather the group and discuss the term: Metamorphosis.

Metamorphosis: (in an insect or amphibian) is the process of transformation from an immature form to an adult form in two or more distinct stages.

What do tadpoles and frogs need to be able to grow and develop?

<https://www.woodlandtrust.org.uk/blog/2019/04/amphibian-life-cycle/>

Play Provocations:

Minibeast Hunting - provide pots, magnifiers, nets and ID cards for hunting and searching.

Pond/Stream Dipping - looking at larvae ID and lifecycles.

Nests - use natural resources to build nests for an egg or toy/clay bird to look after.

Plenary:

Observe, record and discuss findings and new interests in play.

Story Links:

- *Tadpole's Promise* by Jeanne Willis
- *The Woolly Bear Caterpillar* by Julia Donaldson
- *Jasper the Spider* by Jules Pottle

Substitute, Follow-up or Extension Activities:

- Grow sunflower seeds and care for them.
- Classroom tank for lifecycles - keeping tadpoles or insects:
<https://www.insectlore.co.uk/> and
<https://betterplaneteducation.org.uk/factsheets/caring-for-frogspawn-and-tadpoles-guide>
- Invent and design a new creature. Create a lifecycle for this new living thing.
- Seed Study - looking at seed dispersal and the different types. Why is it so important for trees and plants to adopt different methods for seed dispersal? Collect different types of seeds and classify them: poppers, droppers, fliers, floaters, grabbers, and passers. Have definitions and ID charts.

TOPICAL SCIENCE

First Level E&O:

SCN 1-20a

Supporting E&Os:

SOC 1-08a, SOC 1-14a, SOC 1-18a, TCH 1-09a, LIT 1-02a, LIT 1-04a, LIT 1-07a, LIT 1-09a, LIT 1-10a, LIT 1-14a, HWB 1-13a, EXA 1-04a, EXA 1-06a

Big Questions:

What is sustainability?
Why is sustainability important to our lives and our planet?

Real World Jobs:

Forestry, Ecologist, Farmer,

Learning Intention:

We are learning about sustainability.

Success Criteria:

- We can discuss and give our opinion about science topics in real-life contexts.
- We can talk about how people use science in their everyday lives.
- We can describe a variety of jobs and careers which need scientific skills and knowledge.

Materials:

- Global Goals cards:
<https://scotdec.org.uk/download/life-on-land-action-cards/>
- 10 hula hoops
- Whistle/tambourine
- Timer/stopwatch

Starter Activity (15 mins):

Global Goal 15: Life on Land

Every minute an area the same size as 25 football pitches is destroyed.

Ask the group, what would happen locally and globally if we continued to cut down trees at the same rate we do now?

Split into small groups. Give each group a set of Global Goals cards:

<https://scotdec.org.uk/download/life-on-land-action-cards/>

Ask the groups to sort the cards into 2 groups: "How forest clearance affects living things in the rainforest" and "How forest clearance affects us all". They should end up with 7 cards in the "all" group. Next ask the groups to rank the cards from most important to least important. Discuss choices and decisions. How are we connected to these issues?

Main Activities:

Whole Group (25 mins):

Play the Endangered Game:

1. Hula hoops represent the "Trees". Place the hula hoops on the ground.
2. Select 2-3 learners to be "Loggers".
3. The rest of the learners are the "Creatures" who live in the forests.
4. The "Creatures" start in the hoops and must leave the hoops to pretend collect food/water. You can task them to collect one leaf/stick from the ground at a time and bring back to a hoop.
5. The "Loggers" will remove a hula hoop every 15 seconds.
6. After 2-3 minutes, blow the whistle to signal to the "Creatures" to all return home to the hoops. They will notice that they can no longer all fit into the remaining hoops.
7. Discuss how this represents how logging affects the destruction of habitats. What can we change? We still need logging for our human need for materials, so how can we solve the problem about the loss of habitats?
8. Hopefully the learners will suggest planting more trees. Select 2 learners to be the "Rewilders" who will plant trees every 1 minute to represent the long length of time it takes for a tree to grow.
9. Restart the game again with "Loggers" removing hoops every 15 seconds and "Rewilders" re-planting hoops every minute.
10. After 3 minutes, blow the whistle to signal to the "Creatures" to all return home to the hoops. They will notice that even though hoops are being replaced, there is still not enough for them all to fit into.
11. Discuss alternative solutions to the problem. If we protected half the hoops as part of a "Nature Reserve" would that make a difference? Move half of the hoops to make two groups of hoops. Make one group the "Nature Reserve" which the "Loggers" are not allowed to touch.
12. Restart the game one more time. The "Loggers" can only remove hoops outside of the "Nature Reserve" at the rate of one every 15 seconds. The "Rewilders" can still plant hoops every minute.
13. After 3 minutes, blow the whistle to signal to the "Creatures" to all return home to the hoops. Discuss what the "Creatures" notice this time. Was there more space for them to return to the hoops? What difference did the "Nature Reserve" make? Was it a good solution to the problem? Discuss the term "Sustainability":

Sustainability: *the quality of causing little or no damage to the environment and therefore able to continue for a long time.*

Play Provocations:

Build Challenge - Build a sustainable fairy city using natural materials and loose parts resources.

Stick Man - Use clay and sticks to make a stick man. Use scraps of natural fabrics and yarn to make clothing.

Small world farming toys.

Plenary:

Observe, record and discuss findings and new interests in play.

Discuss how can science and scientific skills help us become more sustainable.

What can we do in our everyday lives to reduce our own impact?

Story Links:

- *Wild Places: The Life of Naturalist David Attenborough* by Rocco
- *Greta Thunberg: Little People, Big Dreams* by Maria Isabel Sanchez
- *The Matilda Effect* by Ellie Irving

Substitute, Follow-up or Extension Activities:

- Become an Alien Detective: <https://invasivespecies.scot/wp-content/uploads/2025/04/1.1-Introduction-presentation.pdf>
- Explore more Global Goals activities: <https://scotdec.org.uk/resources/explore-the-global-goals-17-activities-for-primary-schools/>