Practical Pre-School Books

Developing Early Science Skills Outdoors

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Observing

Children who are encouraged to look closely at the world around them develop a sense of curiosity, which motivates them to want to find out more. Furthermore, giving children opportunities to observe objects and living things helps them to develop a basic underlying knowledge of what the world is constructed of and how things work.

This means learning the vocabulary and language needed to name objects and living things, as well as to label features and describe happenings. It also means being encouraged to hone in on individual details and identify similarities and differences.

Observation involves the following skills:

- Being curious about the features of the natural and man-made environment
- Being able to identify places, objects, materials and living things
- Being able to describe the features of places, objects, materials and living things
- Being able to make comparisons and identify similarities and differences
- Being able to find links between different pieces of information.

In the early years children should be provided with opportunities to observe a wide range of natural and humanly-constructed phenomena. Of course, the outdoor environment provides an abundance of both. The following activities aim to spark an interest and get children looking closely at everything around them.

Activity 1: Busy spinners

Type of activity: Adult-led, small groups.

Resources: Magnifying glasses, digital camera.

What to do: Take the children out early on a dewy autumn morning to look for spider webs. Stop to look closely at each one. Ask the children to describe the structure of the web. Do they know how spiders spin them? Encourage the children to look closely at the webs and spiders using magnifying glasses. Can they describe what they see? Watch the spiders working and encourage the children to name their features and talk about how they move. Take photographs, print and laminate them to display.

Key vocabulary: Spider, legs, body, head, eyes, crawl, web, spin, dew, pattern.

Extension ideas: Use information books and the internet to find close up images of spiders and find out why and how they spin webs.

Find some spider webs and spend time watching the spiders.

HOME LINKS

Encourage parents to take their children out on nature walks. Ask them to take photos of what they see and send these in with their children to share with the group. Otherwise challenge them to complete a scavenger hunt and give them a list of objects to find.

Activity 2: Then and now

Type of activity: Adult-led, small groups.

Resources: Strips of black card, double-sided sticky tape, scissors, natural materials, digital camera.

What to do: Take the children outside in late summer and ask them to collect some natural objects such as leaves, seeds, twigs and flowers. Give each child a strip of card with a piece of double-sided sticky tape stuck across the centre. Invite the children to stick their objects along the strip on the card. Talk about the children's collections. Help them identify and name the objects and encourage them to describe how they look, smell and feel. Mount the strips on a display board, take a photo of each strip and save it for later.

After several weeks, print off the photos and take the strips down from the display. Then bring the children together to compare the photo with the strip as it looks now. Encourage the children to describe the differences they can see. Allow them to touch and smell the objects on the strip and ask them if they notice any difference in how the objects feel and smell. Can any of the children explain what has happened to the objects?

Key vocabulary: Leaf, green, brown, soft, dry, brittle, seed, round, hard, flower, colours, shrivelled, dead, decayed, rotten.

Extension ideas: Pick fruits, leave them to decay and observe what happens.

Activity 3: Salt sparkle art

Type of activity: Adult-initiated, during independent play.

Resources: Black sugar paper, paint brushes, salt, bucket, plastic tubs, food colouring.

What to do: Invite the children to help mix a large amount of salt into a bucket of warm water. Once the salt has dissolved, pour the solution into several bowls and add different coloured food colouring to each one.

Give the children black sugar paper for them to paint on with the coloured salt water solutions. Put the pictures out in the sun to dry and watch the water evaporate to reveal coloured sparkly salt pictures.

Key vocabulary: Water, salt, dissolve, mix, colour, dry, evaporate, sparkle, shine.

Extension ideas: Invite children to dip fingers into clean salted and sugared water and taste the difference.

Activity 1: Little ice gems

Type of activity: Adult-initiated, during independent play.

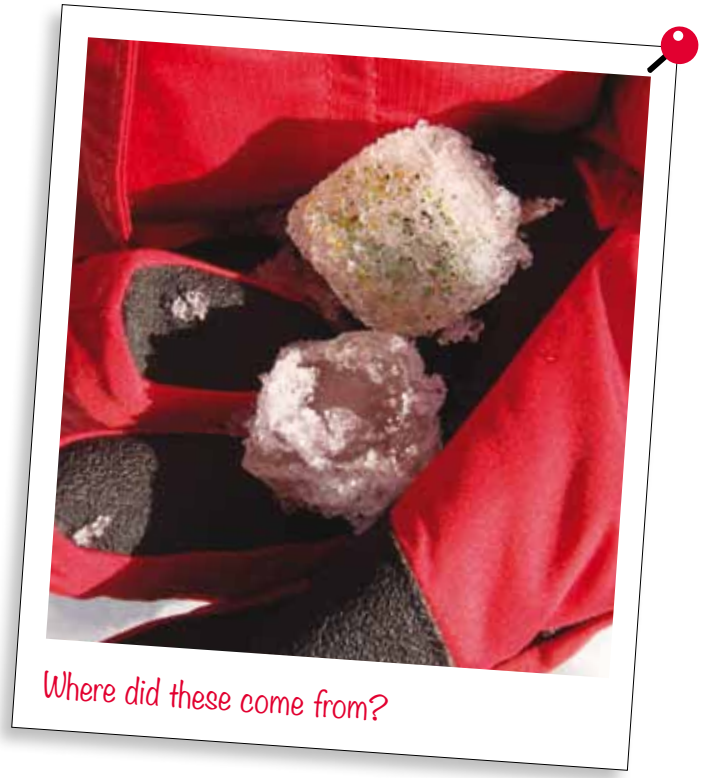
Resources: Snowy weather, ice cube trays, food colouring, glitter, metallic craft shapes.

What to do: Fill some ice cube trays with water. Add colouring and sparkly materials and freeze overnight.

The following morning before the children arrive throw them into a snowy patch so they sink in. Take the children out to play in the snow and wait for them to discover the ice cubes.

Key questions: What are they? Where did they come from? What are they made of? How were they made? What do you think will happen if we leave them there?

Extension ideas: Challenge the children to make their own little ice gems.



Where did these come from?

Try…

…displaying open-ended questions on the inside of windows facing out into the outdoor area. These are useful prompts that practitioners can refer to when talking with the children and sustaining shared thinking.

Activity 2: Shadow monsters

Type of activity: Adult-led, small groups.

Resources: Sunny weather, dark card, scissors, bamboo sticks.

What to do: Cut some monster shapes out of dark card and attach them to bamboo sticks. Take the monsters outside and stand them in the sun so that they cast a shadow. It helps if you have a soil or grass patch that you can push the stick into next to a tarmac area where the shadow will show up clearly. Otherwise snow is a great surface for making shadows. Take the children outside to look at the shadows and see if they can explain how shadows are created.

Key questions: Where do shadows come from? Can you make a shadow? How do you think a shadow is made?

Extension ideas: Allow the children to move the sticks around and see what happens to the shadows. Go out and look at the shadows later in the day to see if they have changed at all.

Activity 3: Fake flowers

Type of activity: Adult-initiated, during independent play.

Resources: Realistic fake fabric flowers, real flowers planted in boxes or borders.

What to do: Before the children arrive at the setting go outside and insert some fake flowers amongst the real ones in the flower boxes or borders.

Invite children to help you with some weeding and wait for them to discover the fake flowers.

Key questions: How do you know they are not real? What are they made of? What is the difference between these two flowers? How do these flowers look/feel/smell compared to those? What do you think might happen if we leave them there?

Extension ideas: Leave the fake flowers in the flower bed to see what happens when the other flowers start to die off. Provide craft materials inside for the children to make their own fake flowers.

Don't forget to think about…

…giving children time to think. Fast-paced questioning puts off less confident children and gives others less time to formulate a considered response. Introduce 'thinking time' or 'wait time' after questions to give children a chance to think.

Enhancing continuous provision

Provide toys and equipment that will enable children to explore a range of scientific inventions and discoveries. Provide a range of resources that will inspire them to create inventions of their own.

Display pictures depicting some of the 'big ideas' of science. Hang laminated photo books on easels and display pictures in sheds or inside windows facing out. Lay out a picnic blanket and provide information books for the children to find out more.

Area of provision	Enhancements that showcase 'big ideas' and encourage children to come up with ideas of their own
Water	Display pictures of boats and ships near the water tray. Provide books about sea transport. Provide water wheels, wind-up propeller powered toys and sail boats. Supply a box filled with plastic tubs, straws, lolly sticks and short lengths of dowel rod.
Sand	Display pictures of builders mixing and using cement with up-close images of bricks cemented together. Provide information books about construction. Provide bricks along with sand, cement powder and water for the children to mix and build with. (Ensure this is closely supervised and give the children face masks, goggles and gloves to wear.)
Construction	Provide construction kits that encourage children to invent and design, hollow building blocks, Sticklebricks, nuts and bolts, interlocking tubes, gears and cogs, LEGO, Magnetico and Mobilo.
Role Play	Space shuttle: Stick silver stars onto a black sheet of fabric and drape it over some chairs. Make a control panel by painting cardboard boxes silver, drawing on number pads and controls with permanent marker and sticking on colourful stickers. Provide information books about space travel and living in space for children to refer to and further develop the area themselves.
Investigation	Challenge the children to source items from around the outdoor area to make musical instruments. Give the children a range of battery operated toys to play with. Build a den using blackout material and provide torches to use inside.
Physical	Display pictures of children using aides designed to help them overcome physical disability, for example, wheelchairs, mobility scooters, stair-lifts, hearing aids and guide dogs. Provide storybooks such as *It's Okay to be Different* by Todd Parr and *Don't Call Me Special* by Pat Thomas.
Garden	Display pictures industrial sized greenhouses and working tractors. Provide information books about the machinery and technology used in farming and agriculture. Place solar powered lights around the garden area. Set up a miniature greenhouse next to an outdoor growing area.

Curriculum links

Coming up with ideas covers the following areas of learning and development:

EYFS	**Talks about why things happen and how things work; recognises that a range of technology is used in places such as homes and schools (UW). Will talk about their ideas and choose the resources needed for chosen activities (PSED). Uses talk to organise and clarify thinking and ideas; listens and responds to ideas expressed by others (CL). Uses what they have learnt about media and materials in original ways, thinking about uses and purposes (EAD).**
NIC	**Asks questions and talks about why things happen; is aware of everyday uses of technological tools (WAU). Shows a positive attitude towards learning; shows independence and knows when to seek help (PDMU). Talks about their work and things they have made; shares thoughts and ideas with different audiences (LL). Uses direct experiences, memory and imagination to observe and respond to the world (AD).**
SCE	**Recognises the impact the sciences make on their lives and the lives of others (S). Has the freedom to discover and choose ways to create using a variety of materials; uses curiosity and imagination to solve design problems (AD). In everyday activity and play, explores and makes choices to develop learning and interests (HW). Shares experiences, ideas and information in a way that communicates their message (LE).**
WFPF	**Thinks creatively and imaginatively; becomes aware of human achievements and the 'big ideas' that have shaped the world (KUW). Becomes an independent thinker and learner; responds to ideas and questions enthusiastically, sensitively, creatively, and intuitively; expresses ideas and feelings creatively, explaining why they are significant (PSD). Talks/communicates, spontaneously and through structured activities, for a variety of purposes, expressing thoughts, ideas and needs (LLC).**

Planning and organising outdoor science

Every setting has a different outdoor environment with particular features and limitations. A large area needs to be designed carefully to ensure the best possible use of space. On the other hand, practitioners with small outdoor areas need to think about how they can make use of nearby public spaces or the possibility of taking regular trips further afield.

When planning and organising outdoor science provision it is important to think about how the outside environment can be utilised to complement and extend the learning that is happening indoors. Outdoor provision is about taking advantage of the unique characteristics of the outside environment and using them to enhance teaching and learning. Plan physical activities that get children playing with scientific concepts and actively experiencing scientific phenomena.

Plan outdoor learning in the same detail as you would the indoor space. Draw a diagram of both the indoor and outdoor areas including permanent fixtures. Photocopy these and use one for each day of the week. Handwrite planned activities and resources onto the diagrams, ensuring you consider logistics in terms of indoor and outdoor supervision. Take account of