

EXPERIMENTING WITH THE *environment*

The great outdoors offers great opportunities for scientific discovery, says **Jennifer Smyth**...

What an educational opportunity! Inside a nursery there may be wonderful books, superb toys and brilliant resources, but nothing there can possibly match the range of opportunities to be found outside. And isn't the outside world what we are seeking to introduce to our children?





There are superb gardens attached to many of the settings I visit, but in the UK some of us are half-hearted in our approach to teaching children about the environment. We have nothing to equal the German *waldgarten* (forest kindergarten) movement – and when I have shown trainees the Teachers TV video on outside play in Scandinavia, many of them have shivered in horror. There is a maxim in Norwegian nurseries that there is no such thing as bad weather, only bad clothing. And, sure enough, there are their three- and four-year-olds, picking logs from the icy edges of frozen lakes, or building igloos from compacted snow, with glowing cheeks inside huge fur-lined body-suits.

We can always make the excuse that in Norway they know their winters are going to be cold whilst in the UK any day of the year might be frosty, boiling hot or tipping down with rain (and sometimes all three). But let's assume we can get outside; what shall we do?

Rain or shine

For a start we can look at all this weather. Is it raining? Let's set up some buckets and beakers and see how much. Is it windy? Let's watch some flags fly, or set up some beach windmills and see how fast they go round. Cloudy? How much of the sky is covered? What shape are the clouds? Are they moving? And, best of all, is it sunny? Let's look at shadows. Our own shadows are best, because they follow us around. And what does our shadow do when we raise an arm? Or a leg? Can we stand still, on a particular paving-stone and get another child to mark where our shadow ends? If we come back in an hour's time, is it still in the same place? What about marking where the shadow of a pole or a climbing-frame is at different times of the day?

Back inside the classroom, we can imitate the movement of shadows using a torch in a darkened area. This is the beginning of a very important concept for children: that the position of the Sun in the sky changes



during the day. It looks as if the Sun is moving, but actually it is the Earth that is spinning – a difficult idea for a child (or indeed, anyone) to grasp, but it is never too early for children to start thinking about this area of understanding. It is also very important for children to learn from an early age that looking directly at the Sun can cause damage to their eyesight.

Counting and planting

There is a huge amount of number-work that children can find outside – from counting the number of paving stones in a path, bricks in a wall or pebbles they can find in the soil, to the petals on a flower, the branches on a tree

or the number of leaves that have fallen – and there are lots of different types of leaves, so sorting them into different piles is a really good exercise. Are all the leaves in one pile the same size and colour?

Planting seeds is another great outdoors activity. Can you grow some of your own vegetables? Some rural schools have extensive gardens where plants can be cultivated, but even urban schools can usually find the space for some raised beds. The installation of the latter can be an excellent opportunity for parents to become involved. Perhaps a parent will give an afternoon a week to help the children tend the plants? This worked very successfully in

TIP

Work on shadows can be imaginatively extended to devise shadow puppet plays. I saw a very successful Christmas shadow puppet show developed by a PGCE student last year with a group of three-year-olds; the 'awe and wonder' we strive to achieve in our teaching was very apparent in the children taking part in the activity.



TIP Don't forget large animals, especially birds. You'll find a variety in any garden, but you can encourage more by setting up feeders in the trees, or even putting up a bird-table (another great project for parents). Try different types of food on the table and see if that attracts different birds. Can the children record the different types by taking pictures of them with a camera?

Perhaps children could build a bird-table as an idea for where a wooden table might be erected. Or children can build furniture for themselves, or for adult visitors. They could even be encouraged to try out new designs for a play area, with climbing frames, see-saws and crawl-tunnels, and so give early encouragement that the environment is there for active interaction rather than passive consumption.

In the summer, how about a Quadro pool? With the addition of a liner that slides over the plastic tubes, such a pool is more robust than other temporary pools and can be used for a great range of activities. Children can build paper boats and see how many pebbles or marbles they will carry (have a net on hand for fishing marbles out of the pool once the boat has sunk). Alternatively, put together two plastic bottles using elastic bands and you have a stable floating base on which children can build masts and sails. You can even put another elastic band around the necks of the bottles, and put in a piece of plastic as a winder – the boat will have just enough energy to get to the other end of the pool.

Another way of moving boats through the pool is by tying lengths of string to them. Build a tower out of Quadro and place it at the end of the pool; lead string over its top, and then tie a small pot to the end. With a couple of pebbles in the pot, it will descend to the ground and pull a boat through the water. If you have two towers and two strings, you can race two boats against one another and give children an introduction to the idea of fair testing – should the towers and pots be the same height, should there be the same weight in each pot? Test out their ideas by seeing what happens if you do change things around, e.g. putting more weight (more marbles) in the pot should make the boat move quicker.

my setting: an urban school in the middle of a large housing estate in London. Many of the children had little experience of gardens or growing plants and as with many early years activities this was another excellent means of involving parents/carers/grandparents in the life of the school/nursery. Some local authorities run garden competitions, and it is

always useful to investigate as organisations such as the Royal Horticultural Society (which manages gardens in many parts of the country) run small garden competitions as well.

Apart from plants, there are lots of interesting animals to investigate in the environment. Bees and butterflies will appear if you plant flowers such as buddleia. On autumn mornings, there will be a profusion of spider's webs to admire. Creating a giant spider's web back indoors provides an imaginative place to hang the children's own spider creations. The web is also very useful as part of a Halloween corner. Snails provide a great counting exercise, as do the number of worms in a spadeful of soil. If you have some logs in the garden, keep them as damp as possible and they will soon be colonised by wood-lice. Encourage the children to be confident in the presence of invertebrates, to handle them with care and to overcome feelings of dislike and revulsion (not always easy, when practitioners also feel the same way!). It is obviously important that children are equipped appropriately to handle these mini beasts – surgical disposable gloves are wonderful for these occasions.

Boat race!
The environment offers opportunities for more than just observation. One of the great features of the waldgarten is that shelter-building, with branches and turf, is one of the curriculum activities. You may not want to drag trees and branches indoors, but a product like Quadro offers great opportunities for building in the grounds.

Nurturing knowledge

Growing plants from seed is a classic nursery activity. In spring-time, the nurseries I visit have every available window-ledge filled with pots of seedlings, the young plants all curving towards the light from the window. One interesting extension children can try is to build 'light-boxes' for their seedlings. They will need a cereal box (or similar), with one of the long walls cut away. Cover the three remaining interior walls with kitchen foil, as smoothly as possible. Now grow the seedling in a pot on the window-ledge inside the box – the foil will reflect sunlight onto the side of the seedling away from the window, so the plant will grow without curving (it should grow taller too, as it receives more light; but that is an effect the children can investigate themselves by growing some plants with the boxes and some without).

Experiments like this introduce the idea of creating fair testing at an early age, helping to create a foundation of scientific understanding that will be very useful later on in children's school lives.

findoutmore
Jennifer Smyth teaches science in the Department of Education at London Metropolitan University. She is the author of *Enhancing Early Years Science* published by Trentham Books.