

# Fizz, bang...

Increasing numbers of early years settings are recognising the importance of STEM subjects within an early years curriculum. **Charlotte Goddard** speaks to one



Clockwise from top left: jumping raisins; outdoor balancing; bouncy eggs

**S**mall children are natural scientists, driven by an innate desire to explore, question and understand the way things are. Many settings are now focusing more on STEM (science, technology, engineering and maths) subjects in order to support children's drive to understand the world around them – and sometimes adding 'the arts' to their explorations, given the importance of creativity in exploring these subjects (see panel overleaf).

Settings across the UK took advantage of British Science Week in March to organise fun activities to help children explore science, technology, engineering and maths sessions. Among them was

Outstanding-rated Alyth Kindergarten. Part of the North Western Reform Synagogue in North London, the setting was established in 1970 to provide pre-school progressive Jewish education.

The setting celebrated British Science Week with a wide range of activities, but also prioritises STEM throughout the year. 'Every week we run a different specific science-focused activity,' says afternoon school team leader Natalija Kosec. 'But we also believe science should be part of everyday activity. We might go out on a nature hunt, or to look at daffodils, or children might like to play with magnifying glasses and tweezers.'

During the week, Alyth decided rather than delivering one

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**MORE INFORMATION**

- **NDNA and British Science Week pack**, <https://bit.ly/2Hnkw88>
- **The Royal Institution Experimental:** films of fun, easy and cheap science activities, <https://bit.ly/2dBBnGj>
- **Institute of Civil Engineers pre-school and Reception pack**, <https://bit.ly/2HKwLZu>

afternoon science session a week, it would run three to five experiments every day. 'We had an amazing response, the children loved it,' says Ms Kosec.

**EXPERIMENTS**

For inspiration, Ms Kosec turned to the NDNA's website, where she was able to download an activity pack themed around exploration and discovery, and Pinterest. The youngest children taking part were two and the oldest four.

So, explains Ms Kosec, 'We made sure that we included activities that didn't need instructions, where children could just explore, like playing with lights.'

**Bouncy eggs**

One experiment that the children

particularly enjoyed was creating bouncy eggs. 'You put the eggs in vinegar for 24 hours and the acid causes the shell to dissolve,' says Ms Kosec. 'The egg becomes more plastic-like, and the children can bounce it. It eventually breaks, but then they can play with the yolk and see what that feels like.'

### Fireworks and raisins

A 'magic milk fireworks' activity saw children adding soap to a mix of milk and food colouring, and witnessing the resulting colour explosion, while 'jumping raisins' allowed children to make raisins dance by adding baking soda and vinegar to water. The resulting bubbles of carbon dioxide carry raisins to the top of the liquid, then burst and allow them to sink.

### Fizzy and glittery potions

Another particularly successful activity was making fizzy, glittery potions, which gave children a hands-on experience of the properties of different materials such as baking soda, vinegar, glitter and washing-up liquid, and how they combine with each other.

'The children made them by themselves, it was very messy, but they loved it,' says Ms Kosec. 'Children learn the most when they try something, and they learn from trial and error, so it doesn't have to go right first time. For example, we tried the Mentos and Coke experiment, where the Coke and mints react together to create a gas which causes the liquid to spray upwards, but we didn't put enough soda in and it didn't work – so we learned you sometimes have to change what you are doing to make something work.'



The 'walking rainbow' activity involved mixing colours in a new way

### Walking rainbow

An activity called the walking rainbow allowed children to explore mixing colours in a new way. Children filled glass jars with water and added different colours to each using food colouring, then placed a folded strip of paper towel so it had one end in one jar and the other end in another. They were then able to watch red water moving along the paper strip and mixing with the yellow water in the second jar to create orange.

The activity demonstrates the way water can move against gravity due to capillary action, but for young children the aim might be to demonstrate the mixing of primary colours to create secondary colours.

### BOYS AND GIRLS

The activities were particularly successful in engaging girls in the setting, says Ms Kosec. This is an important aspect of STEM work, considering only 35 per cent of girls choose maths, physics, computing or a technical vocational qualification, compared with 94 per cent of boys at age 16, according to gender equality organisation WISE, and more than nine in ten STEM apprenticeship achievers are men.

'There are some girls who will only play in the role-play area,' Ms Kosec says. 'One in particular who never engages with teacher-led activities in the afternoon was so keen to be part of it.'

Engaging children with STEM does not require particular training or equipment. 'We had basic equipment like tweezers and pipettes, torches and trays,' says Ms Kosec. 'All in all, we spent about £10 for the week on things like baking soda, vinegar, some daffodils.'

## Broadbrush

### Settings must not let art and design fall down the agenda, says creative arts consultant **Anni McTavish**

While many settings are doing great work, some are uncertain about the place of Expressive Arts and Design in early learning, and the breadth of experiences that it encompasses. One of the wonderful things about art is that it enables a setting to express who they really are, and how they link with the community.

Art experiences can take place throughout a setting. I recently worked with Sheringham Nursery School and Children's Centre in Newham, London on a wide variety of exciting arts experiences to support and inspire new learning. On one occasion, during a torrential rainstorm, we explored paint in the puddles, and the musical sounds of raindrops splashing down from the roof.

Another setting I know was facing challenges linked to SEN and behaviour, and felt it was important to make lunchtime relaxed. They laid the tables with tablecloths, mats and plants, and played calm music. This was a creative experience in the way it was set up, and it had a huge impact on children's social development.

Practitioners may lack confidence when it comes to art, especially if they have missed out on creative experience themselves as children. I encourage them to develop an eye for art by looking at buildings or shop windows and thinking about what they like about them, or by drawing children's attention to the patterns of leaves above their heads. Having an artist come in and work with a setting can also be inspiring.

### GOALS AND ASSESSMENT

A plus-point of the current EYFS is that 'being creative' is seen not just as an 'art experience', but also as a characteristic of learning. This makes it easier for practitioners to understand that creativity spans all areas of the curriculum. However, I am horrified at Government moves to focus more on literacy and maths in early years and to perhaps omit some areas of learning from the EYFS Profile. Already, EAD often seems to be considered last in settings, and this could make it easier for art to drop off the radar.

Arts Council England is consulting on developing a creative quality standard for early years settings, and there has been talk of a need for more defined goals, but I believe EAD should be kept broad. Assessing EAD requires a focus on the process, rather than just the finished product. It is also important to recognise the broad range of experiences that can be involved.

It is as if the Government is ignoring research about how art often teaches skills that other subjects can't. And if a child misses out on some stages of development – such as developing a willingness to try new things – they will find it harder later on. Practitioners can help overcome parents' anxiety about 'school readiness' by explaining how early explorations with paint and glue lead to mark-making, drawing and writing.

→ **Creative Thinking and Learning Project by Anni McTavish, <https://bit.ly/2HmMqkS>**