

## Models and analogies

The theme for this issue takes us all on a journey to successfully tackle the often-tricky challenge of teaching abstract science concepts, which can be one of the toughest tasks for the primary practitioner. This issue not only offers some supportive pragmatic advice, but also some welcome insightful, challenging and creative activities. I am also delighted that there is more than a touch of celebration of primary teachers and their science teaching!

For the 'In conversation with...' piece in this issue, Kate Sutton talked to Dr Claire Lee from CERN. A leading expert on particle physics, Claire is a strong advocate not only for women in science, but also for the use of analogy in her teaching about her work, in particular her ground-breaking investigations into the world of neutrinos. No stranger to supporting outreach science on social media, she has also been adept at using familiar primary teaching props like LEGO to model some of the most complex and abstract scientific concepts involved in particle physics – a very fitting interview for our theme.

Tackling abstract concepts in primary science is taken up in three distinct ways in the articles by Paul Tyler, Leigh Hoath and Juliet Edmonds. Paul presents a highly practical way of helping children learn about abstract concepts – including space – through the use of interactive digital simulations, models and analogies. These include the highly innovative interactive online modelling resources from Professor Carl Wieman's Physics Education Technology (PhET) project at the University of Colorado Boulder. Leigh's article gets us to reflect on what we need to consider when helping children learn about large and abstract concepts. She reminds us of the need for child-centricity, and the importance of language awareness, among other things, when teaching difficult ideas. Juliet's piece then considers the use of children's own expressive creativity as well as the cognitive domain to support their acquisition of challenging concepts. Although distinct aspects on the teaching of

abstract concepts, together these three dovetail into useful holistic food for thought.

Some thought-provoking innovation in primary science with an emphasis on the written word is the basis of the article from Andrea Hughes. She took a lead role in a school-based project, developing a storybook to teach science. Andrea questions the accepted wisdom surrounding the choice of books we use to teach and support the acquisition of science concepts by children.

Of course, science concept acquisition purely for the sake of recounting it has been recognised as outmoded for some time. With a blossoming of the socio-scientific imperative now conspicuously prevalent in much of good primary science teaching, it is important that any science learned by children should, ultimately, be of some social value and be capable to being put to everyday use. In her work with the BBC, primary teacher Charlotte Smailes introduces us to a brand new and innovative eco-resource, *The Regenerators*. Her discourse on its rationale and impact upon her practice

is noteworthy. In a similar vein, Eleonora Hristova and Verity Jones and her colleagues offer their own views and advice on the place of children utilising science concept learning in modelling sound eco-practice towards a better environmentally balanced and more sustainable world.

Finally, and in one way very much from a personal viewpoint, it was great to hear that the prestigious Alexander Award from the Association for Science Education, was won recently by a fellow primary practitioner. Awarded annually to a woman or group of women, for making a significant contribution to STEM education of girls or women in situations of scarce resources, it is of major significance in the field. This year's recipient, Katie Wylie, is inspirational as a model of good primary science teaching and her story is a worthy analogy when it comes to describing to others all that is best in supporting children's attainment in the field.

**Robert Collins**

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