

Critical thinking in science

I think it is fair to say that this start to the academic year is like no other. Seeing this from both sides as an educator and a parent I know that the logistics are many and tensions run high. One of the things that people seem to find hardest to manage is the uncertainty – and not unsurprisingly so.

This issue sees the first of a series of articles that have evolved from the ASE's 'In conversation with...' interviews. If you have not seen them, they are a must! This opening one starts with Professor Sir John Holman, who led the discussions with a number of scientists. In forthcoming issues we will hear from these scientists: Dr Jess Wade in the 'Gender in science' issue, the Nobel-prize winning chemist Professor Ben Feringa and Professor Chris Lintott, presenter of BBC's *The Sky at Night* among other things. I am delighted that they took the time to speak to us, but also that these articles will appear here in a primary-age-phase publication. The one aspect that was consistent across the interviews was the respect they held for primary teachers and their ability to shape the futures of the children they teach. Teachers are described as being powerful and as having the potential to 'light the fires that others can nurture to last a lifetime' (Professor Sir John Holman). This really did make me think again about what we do in schools and how influential we can be, often without realising that there is a real power behind what we do.

Sir John also discusses the need to embrace uncertainty – which is easier said than done in many aspects of life. Again, it really made me think about how uncertainty in science is so important. It is uncertainty that yields new discoveries, some answers and definitely more questions! This makes me wonder what we are doing in our science teaching to ensure that such uncertainty

is welcomed, used positively in challenging ideas and thinking, pushing children to see science as far more than knowledge and facts.

I also wonder what role the media plays in this – both social and in relation to the broader press. We have heard the term 'the science' used so much, as if it is an answer, a thing, a single entity to be guided by, rather than recognising the uncertainty that 'the science' is based on. Social media allows views to be aired that are then affirmed by like-minded followers, which make the views more concrete than before. Does this create more of a dichotomy of views rather than discussion of ideas? Does there have to be one right answer or stance? It feels

as if the curriculum, media and the ability to share perspectives so easily and widely, almost push people into having a stronger and less open stance than before.

One thing I hope we teach children about science is that it is a changing body of knowledge and that it is all right to think one thing, which shifts to thinking another. Uncertainty is difficult to invite in, but one of the key aspects of teaching and learning science has to be encouraging the children to listen to the different points, engage meaningfully in discussion and not be instantly

dismissive of alternatives that are, to them, 'wrong', because they don't align with their own initial thoughts.

Science can teach us so much. I am sure we agree on that. Having the confidence as teachers to embrace uncertainty is another big step, but one that will support children in developing their view of what science is. So where there is uncertainty elsewhere in life, which is proving to be a bit of a stone in your shoe, let's see it as a positive in learning!

Leigh Hoath

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