



## INTRODUCTION

Following the publication of the Summary of Proceedings report on the 2020 conference earlier this year, the Organising Committee were charged with producing a report on the key recommendations arising from the conference.

This report offers a series of recommendations concerning the school curriculum, the relationship between science and the citizen and suggestions for enhancing the science education experiences of young people.

The recommendations mirror the wide range of views expressed at the conference and are not necessarily those of the Conference Organising Committee. It is likely that the Scottish Science Advisory Committee will touch on many of these issues when it reports to the Scottish Executive later this year.

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Conference Organising Committee

## The curriculum

- ◆ The science curriculum is overcrowded and dominated by factual knowledge.
- ◆ Summative assessment dominates what happens in classrooms.
- ◆ Science education must offer clear progression from 5 to 18, avoiding the fault line in both content and methodology at age 12.
- ◆ Teachers and teaching must move away from traditional methods and should pay more attention to learners, their interests and voices.
- ◆ Separate science subjects can create curriculum barriers for learners.
- ◆ Opportunities, for example in engineering or earth sciences, don't easily find an audience.
- ◆ Learners are motivated more by personal involvement than by "whizz-bang" 'wow' demonstrations. The Science Challenge is such an example.
- ◆ Funding for science equipment needs to be adequate to cover investment in new kit but also the cost of replacement and repair.
- ◆ A drive is needed to ensure graduates are attracted to science teaching and remain there once qualified.
- ◆ The management and leadership role of Principal Teachers ought to be recognised and not under-mined.
- ◆ Technician support should not be undervalued. Adequate career structure and remuneration is required for a skilled force of science technicians.

## Science Education beyond the classroom

- ◆ Out of school enrichment activities ought to be an entitlement for all learners and for all teachers.
- ◆ Such activities are not evenly available. Learners in more distant locations need to be offered these experiences.
- ◆ Stronger links between providers, teachers and learners are needed to ensure that specific needs of all parties are met.
- ◆ Out of school providers would benefit from mutual collaboration, to share ideas and to reflect on strengths of provision and build on best practice.
- ◆ Taking children out of school is problematic. Bringing science into schools is likely to be more achievable.
- ◆ The crowded curriculum militates against such enrichment activities.
- ◆ A restructured curriculum might integrate such events into the learning journey for all pupils.
- ◆ Visiting science experiences are essential in helping turn young minds towards careers in science and engineering.
- ◆ Discrete school subjects militate against collaboration across sciences and between sciences and technology. There are barriers here which need to be dismantled.
- ◆ Extended research projects will find a place but only if the curriculum is engineered to allow space for them.

## Science and the Citizen

- ◆ A radical rethink is needed to assess the purpose of science education.
  - ◆ Teachers and schools need to be engaged in such debate.
  - ◆ Models of a new science education ought to be created, shared and debated in order to ensure that forward-looking change can be planned for.
  - ◆ Science education must move forward taking with it a society which understands the arguments for, and direction of, change. Parents, employers, teachers and politicians need to share and understand the new visions.
  - ◆ An education in science ought to include an understanding of the key ideas from science (the science content) as well as those cultural elements which define science as a way of understanding the world (the ways of science).
  - ◆ The 'public understanding of science' movement must strive to ensure that the broader view of science, beyond the traditional knowledge-bound stereotypes, is conveyed across all areas of society.
  - ◆ The debate, together with emerging changes, will need to feature in new programmes of initial teacher education as well as in CPD for all teachers.
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