

# THE LEARNED SOCIETIES' GROUP ON STEM EDUCATION

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Ms Shirley-Anne Somerville MSP  
Minister for Further Education, Higher Education and Science  
The Scottish Government  
St Andrew's House, Regent Road  
Edinburgh  
EH1 3DG

25 October 2016

Dear Ms Somerville

## **Curriculum for Excellence Benchmarks: Sciences**

I was pleased to meet with you last month to explore ways in which the Learned Societies Group on STEM Education in Scotland<sup>1</sup> (LSG) can contribute to the education reforms in Scotland. The LSG welcomes the opportunity to comment on the draft Benchmarks for Assessments in the Sciences. Given the short timeframe for initial comments, this response focuses on matters of principle underlying the Benchmarks' concept. We note that there will be ongoing opportunities to comment on the Benchmarks. In view of this the LSG is establishing a sub-group to provide more detailed comment on content of the Sciences' Benchmarks. We hope Scottish Government and Education Scotland will find this helpful.

We welcome the intention behind the development of the Benchmarks as a means of making progress on the Scottish Government's commitment of providing clear curriculum advice and on streamlining existing guidance. We are pleased to see that the Sciences' Benchmarks make clear the relationship among the Benchmarks, the Significant Aspects of Learning (which are now embedded within the Benchmarks) and the Experiences and Outcomes.

An overriding criticism of the implementation of Curriculum for Excellence (CfE) and the national qualifications is that there has been a proliferation of guidance material. We recognise that Education Scotland faces a dilemma of having been tasked with developing new guidance to help teachers interpret CfE requirements while simultaneously having to address the workload demands placed on teachers.

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<sup>1</sup> More information about the LSG is available from:

[https://www.royalsoced.org.uk/1076\\_LearnedSocietiesGrouponScottishScienceEducation.html](https://www.royalsoced.org.uk/1076_LearnedSocietiesGrouponScottishScienceEducation.html)

The rationale for the development of the Benchmarks is simplification, streamlining and clarification of existing guidance. It is however difficult to reconcile this with a document of additional guidance for the sciences which currently runs to 62 pages.

If it has not already done so, we would strongly encourage Education Scotland to engage with those with expertise in curricular theory and analysis as it develops the Benchmarks. We believe this to be very important to ensuring that the Benchmarks do not compound the difficulties teachers have experienced in using the Experiences and Outcomes in planning for learning.

As part of this, careful attention needs to be given to using appropriate processes for bringing about change. The Scottish Government and Education Scotland need to make clear what impact the Benchmarks are intended to have and how will this represent an improvement on what went before. As part of developing a strategic approach, we recommend building-in independent, high-quality evaluation, to ascertain the impact that the Benchmarks are having.

A fundamental issue that needs to be addressed is the extent to which the Benchmarks align with the original intentions of CfE, especially that which relates to enhancing the professional autonomy of teachers. The Benchmarks advise that '*practitioners should avoid overly bureaucratic or tick-box approaches*'. Yet, that is what they risk encouraging given their prescriptive and content-heavy approach, as exemplified by the draft Benchmark, below.

Experience and Outcome	Draft Benchmark
<p><b>By safely observing and recording the sun and moon at various times, I can describe their patterns of movement and changes over time. I can relate these to the length of day, a month and a year.</b></p> <p style="text-align: right;"><b>SCN 1-06a</b></p>	<ul style="list-style-type: none"> <li>• Describes the relative size of the Earth, Moon and Sun.</li> <li>• States the Earth is the planet we live on which orbits the Sun.</li> <li>• Explains that the Earth is round and spins around an imaginary line called its axis in 24 hours, providing us with days.</li> <li>• Explains how the rotation of the Earth causes day and night.</li> <li>• States that the Earth takes one year to completely orbit the Sun.</li> <li>• Explains that the tilt of the Earth on its axis as it circles the Sun causes seasons.</li> <li>• Explains that the number of daylight hours changes with the seasons.</li> <li>• States that the Moon is a large rock which orbits the Earth approximately every 28 days (a lunar month).</li> <li>• Records, observes and explains why the Moon appears to have different shapes and positions in the sky at different times.</li> <li>• Records, through safe observation, that the sun changes position during the day and gives reasons for shadows changing.</li> </ul>

The Benchmarks would appear to be at odds with the notion of ‘active learning’, which is said to be central to all stages of CfE. Active learning focusses on the development of vital higher-order thinking skills rather than merely the retention of content. We contend that the introduction of the Benchmarks, building on as they do the Experiences and Outcomes, serve to reinforce that in reality CfE is increasingly becoming a content-driven curriculum. It is interesting to note that a number of the Third Level Benchmarks<sup>2</sup> are remarkably similar to Standard Grade Learning Outcomes.

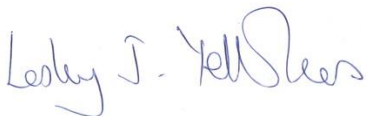
If the distinctive and innovative intentions of CfE are to be realised, then continuing effort should be focussed on building the capacity of the teaching profession so that it is able to rise to the opportunities associated with greater freedom. From this perspective the Benchmarks could be regarded as a counterproductive development.

If there are to be Benchmarks, then it will be important to ensure that realistic timescales are set to enable widespread engagement of teachers in contributing to their development. We note that the intention is to complete the pre-publication consultation and quality assurance process by the end of November. The timeframe for comments is therefore short (particularly as it coincided with the half-term holiday for teachers).

We believe that Education Scotland should not have been put in the position of having to consult on the detail of a pre-determined approach for new guidance. Rather, it should have been enabled to undertake a more expansive engagement process with teachers which focuses on supporting their needs in meeting the original aspirations of CfE.

We should be pleased to discuss further our comments with you. Please feel free to share our response with your colleagues and officials within Scottish Government and Education Scotland.

Yours sincerely,



Professor Lesley Yellowlees CBE  
Chair of the Learned Societies Group

cc. Dr Bill Maxwell, Chief Executive, Education Scotland

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<sup>2</sup> For example, see the Benchmarks under the following Es and Os for the Sciences: 3-15, 3-16 and 3-19a



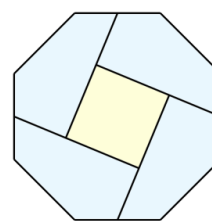
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