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Contributed talk: The Development of a Maths Toolkit for Physicists

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The physics course at Sheffield Hallam accepts a range of mathematical expertise as a prerequisite. To enable this position, we deliver a dedicated maths module (as many courses do) which provides all the foundational knowledge students will need in order to complete the course. Despite this we have consistently encountered students struggling to put this maths into practice when they move on to topics which require them to do so. This talk discusses the steps we have taken recently to provide bespoke maths support for our students. The main output of this intervention has been a 'maths toolkit'which can be used as a self-signposting resource to enable students to troubleshoot their own difficulties.
This sort of development is not new in and of itself, however, through research into our students'attitudes to mathematics we have found that there is a distinct lack of understanding that the maths they are studying is a tool to be used in performing the science of physics rather than a series of esoteric oddities that they must learn for their own sake. With this in mind, we have intended our toolkit to act not only as a technical support resource, but also a way to change student attitudes to maths in the service of physics - to see it as a tool to be used akin to spanners for an engineer This project has been student led at all stages. We discuss the findings of our research into student opinions of maths, as well as how they engage with the material they are provided. We then touch on the disconnect between how students compartmentalise maths and how we intend for it to be used by them can inhibit learning and increase maths anxiety. Finally we discuss the mechanics of putting this toolkit together.

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