Where is the Mathematics in Teacher Designed STEM Tasks?

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Promoting integrated STEM education to engage students in learning the STEM subjects and highlight the potential for pursuing a STEM career implies the need to redesign curriculum from siloed subjects to some new arrangement. While some providers have developed integrated STEM tasks, to meet the needs of students, teachers need to become designers of STEM tasks. Such tasks need to enthuse students, purposefully connect the STEM subjects, retain STEM subject integrity, and allow for deep learning. Designing tasks that include all four STEM subjects in an authentic way is challenging although some suggest this is not necessary if at least two of the STEM subjects are represented (e.g., Kelley & Knowles, 2016). Roerhig et al. (2021) argued the integration of mathematics can be difficult and should not be limited to a tool to the service of science and engineering. This argument might encourage teachers to avoid integrating mathematics into STEM tasks whereas providing students with integrated STEM learning experiences that foreground mathematics helps to promote the importance of using mathematics to solve important problems. Maass et al., (2019) advised mathematics could play a powerful role in integrated STEM tasks using three interdisciplinary practices—twenty-first century skills, mathematical modelling and education for responsible citizenship.

To support teacher design of integrated STEM tasks, a professional learning program for primary school teachers, organised by the first author and colleagues (Anderson & Tully, 2020; Way et al., 2022), provided advice and mentoring support as teachers designed tasks to trial with their students. Since teachers had varying experiences of designing integrated STEM programs, the types of tasks ranged from shorter, design focused with mathematics as a tool to measure lengths or time, to longer inquiries based on driving questions where mathematics could be used to investigate patterns and propose solutions to more challenging questions. Examples of the range of tasks will be presented.

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