

SOUNDING MATHEMATICS: HOW INTEGRATING MATHEMATICS AND MUSIC INSPIRES CREATIVITY AND INCLUSION IN MATHEMATICS EDUCATION

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Short description of the workshop: aims and underlying ideas

In this workshop, participants will be introduced to the principles underpinning our integrated approach to the teaching of mathematics and music, within the context of “low threshold, high ceiling” tasks. Participants will have the chance to engage with a number of activities from the Comenius Project “EMP-M – Sounding Ways into Mathematics” (2013-2016). The activities will explore patterns and relationships in mathematics and music, and issues with communication which are common to both curriculum subjects. These will provide the opportunity for participants to experience how each of these curriculum subjects can be learned together and truly integrated in order to support learning and deeper understanding within and across both domains. We hope that the participants will be surprised and inspired by the potential for mathematics and music learning. In our project we have been collaborating with teachers from different disciplinary backgrounds. Experience in CPD Courses and in classrooms has shown that in the same learning situation, learning can go in different directions for different learners. When we are prepared for different and diverse thinking paths the unexpected is what makes teaching motivating and exciting. It is almost unbelievable what children can teach us when we take the risk of presenting them with questions and problems we do not have the answer to before we start.

Planned structure:

Insert the planned structure of the Workshop here after leaving ONE empty line below the abstract. Please use this style for the timetable and insert necessary rows. Due to technical reasons the timetable shall not exceed 10 rows.

Planned timeline	Topic	Material / Working format / presenter
0-15	Introductory activities exploring place value, pattern and rhythm. This will be followed by a discussion of aspects of beauty in both mathematics and music.	Participants will engage in all the activities. Markus Cslovjecssek will lead this part of the workshop.
15-35	We will present a short introduction to the ‘EMP-M Sounding Ways into Mathematics’ project and the	Video and presentation with opportunities for questions

	background literature which informed our approaches. This will include some discussion of how teachers have used and adapted the ideas they have taken from the project.	Caroline Hilton and Markus Cslovjecsek will share this part of the workshop
35-75	We will start with an exploration of Steve Reich’s ‘Clapping Music’. We will consider whether it is easier to ‘hear’ or ‘see’ the patterns. We will try a number of activities that have been developed within the project. This will be a very active part of the workshop.	Video and active engagement in activities Caroline Hilton and Markus Cslovjecsek will share this part of the workshop
75-90	We would like to end with a discussion to provide time for reflection and questions	Discussion Caroline Hilton and Markus Cslovjecsek will share this part of the workshop

References

Still, K., & Bobis, J. 2005. The integration of mathematics and music in the primary school classroom. In P. Clarkson, A. Downton, D. Gronn, M. Horne, A. McDonough, R. Pierce, & A. Roche (Eds.), *Proceedings of the Annual Conference of the Mathematics Education Research Group of Australasia. Building Connections: Theory, Research and Practice* (pp. 712-719). Sydney: Mathematics Education Research Group of Australasia Inc.

Zeki, S., Romaya, J. P., Benincasa, D. M., & Atiyah, M. F. 2014. “The experience of mathematical beauty and its neural correlates”. *Frontiers in human neuroscience* 8.

If you want to find out more, look at our publications on the European Music Portfolio – Maths: Sounding Ways into Mathematics website (<http://maths.emportfolio.eu/index.php>)