



European Music Portfolio (EMP) – Maths: Sounding Ways Into Mathematics



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Where are we now and where are we going?

- The English national curriculum has recently undergone a number of changes
- Music is a universal language that embodies one of the highest forms of creativity
- Mathematics is a creative and highly interconnected discipline

**The national
curriculum in
England**
Framework document
July 2013



Where are we now and where are we going?

- No attainment targets
- In music, the change was designed to encourage schools to develop context specific understandings of musical progress, based on the particular musical strengths of the school
- In mathematics, there are now very specific expectations of **what** mathematics should be covered, but less detail in terms of **how** it should be taught



Where are we now and where are we going?

Consider the principles that underpin the new curriculum.

In music, children should be taught to:

- understand and explore how music is created, produced and communicated



Where are we now and where are we going?

Consider the principles that underpin the new curriculum.

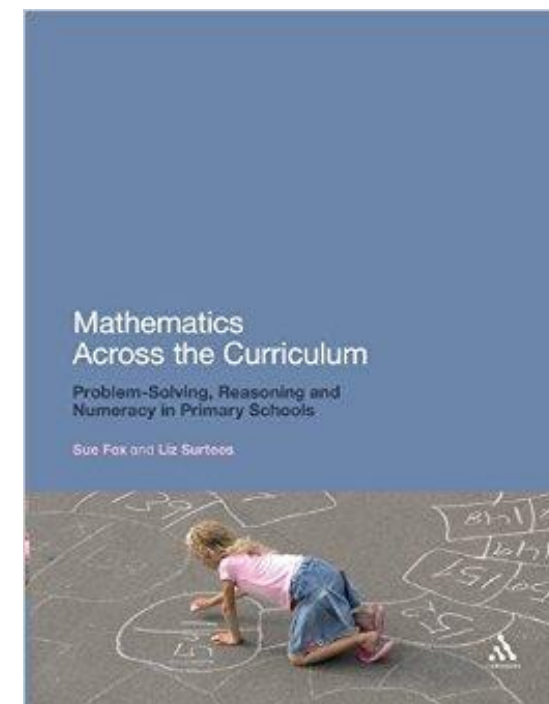
In mathematics, children should be taught to:

- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations
- solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication



Where are we now and where are we going?

- In England there is a growing interest in the teaching of mathematics across the curriculum
- Studies have shown that poor numeracy skills are more damaging than poor literacy skills
- In England, both music and mathematics are often believed to be subjects that require talents that are shared by a special minority



Why is the EMP-M project important and what are the benefits?

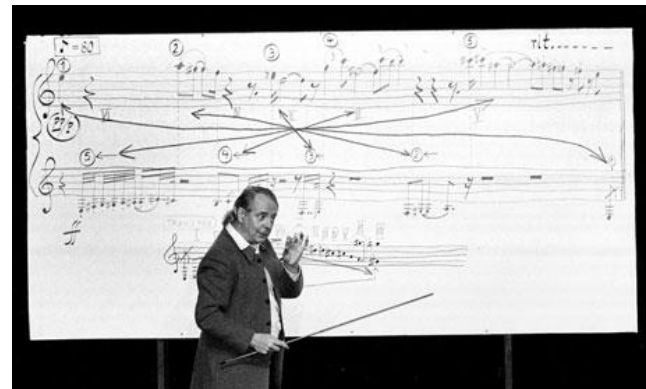
Provides us with a chance to explore ideas that were raised over a decade ago. In other words, we can seek to explore questions such as:

- Music makes significant use of symbolic representation, as does mathematics. Do we use the similarities in the ways symbols are interpreted in both subjects?
- Is the study of pattern in musical forms such as **ABA**, **AABA**, **ABAB** (leading to fugue, sonata and symphonic form) enhanced by pupils' understanding of repeating patterns in mathematics?



Why is the EMP-M project important and what are the benefits?

- It provides us with a chance to have a stronger cross-cultural perspective that will benefit our multi-cultural school contexts
- It aims to ensure that primary generalist teachers feel more confident to teach music **and** mathematics
- It aims to develop a deeper understanding of many of the structures shared by music and mathematics



NRICH: Clapping Times

For this activity, you'll need to work with a partner, so the first thing to do is find a friend! Together, count from 1 up to 20, (1,2,3...) clapping on each number, but clapping more loudly and speaking loudly on the numbers in the two times table, and quietly on the other numbers.

Now clap the five times table together up to about 30, so this time you are clapping more loudly and speaking loudly on the multiples of five and quietly on the other numbers.

If one of you claps the twos in this way and one of you claps the fives, at the same time, can you predict what you would hear?

Which numbers would be quiet?

Which numbers would be fairly loud and which would be very loud?



NRICH: Clapping Times continued...

Choose another pair of tables and repeat what you have just done.

How about the twos and tens?

Why not try the fives and tens?

Each time predict what you will hear **before** you clap - which numbers will be loud, which fairly loud and which will be quiet?



The Swiss team

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Where are we now and where are we going?

A look into the past:

Step 1: Where are the transfer effects?

1988-1991: Musik macht schule (Music makes the school), a Swiss long term Study

Ernst Waldemar Weber, Maria Spsychiger, Jean-Luc Patry

Step 2: A new understanding in interdisciplinary teaching: 2001-2004, the Mathe macht Musik (Maths does Music) - Textbooks

Markus Cslovjecsek et al. + Generalisten



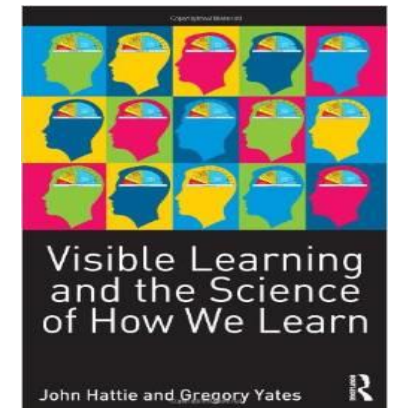
A look into the past:

Step 3: A european dimension of interdisciplinary teaching: 2006-2015, EMP-L
(languages) leads to EMP-Maths

Markus Cslovjecsek, Helmut Linneweber Lammerskitten + **Spezialisten**

Hattie, Visible Learning and the Science of How
We Learn (2013); Chap. 23, How music impacts on
learning

- Effect of background music, Mozart effect, Transfer Effects



Why is the EMP-M project important and what are the benefits?

Today's situation in Swiss schools:

- Integrated teaching is rarely used to seek a holistic approach in Music lessons
- In Maths, musical and auditory approaches only occur when dealing with particular topics

The expected benefits....

- We see opportunities for overcoming the teaching challenges of heterogeneity, gender and inclusion
- The auditory Approach: a help in all school subjects



What are the challenges we face in our country?

Lehrplan 21 (National Curriculum 21)

- A new curriculum is being introduced
- Integrated teaching forms are mentioned and valued, but not implemented consistently.

Two examples of traditional practice in Swiss Schools:

- Timetable songs (Primary School)
- Pythagoras (High School)

Lehrplan **21** |



- Multiplication songs (Primary School), 3x3 Fidimaa

7x7 Multiplication Table Song



*Seven, fourteen, twenty one, twenty eight, thirty five, forty two, forty nine.
Hey we are working hard. Only numbers missing are fifty six, sixty three, seventy.*

