

## Mathematics and body entangled in workshops with art

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*Keywords: Visuality, cartography, philosophy of difference, new materialism.*

### Introductory words

The aim of this poster<sup>1</sup> is to highlight the embodied nature of mathematical activity through of arts-based activities in classrooms. Our Research Group in Contemporary Studies and Mathematics Education<sup>2</sup> has been creating and performing art workshops with grade 5 children, in which mathematics appears in its materiality, entangled with body and mind. With them, and through a posture of cartographic research, visualities of a material culture of mathematics are exercised and resonate as an effect of “a material memory of things read, heard or thought” (Foucault, 1994/2006, p. 147).

Concerning cartographic research, we draw inspiration –among other authors– from Deleuze and Guattari, who propose a cartography approach that goes beyond simply representing a territory, and instead focus on creating connections and lines of flight that can open up new possibilities for existence and thought. This approach emphasizes the importance of embodied knowledge and experience over universal objectivity, encouraging us to use our senses and bodies to explore and create knowledge.

Moreover, a workshop is not intended as a controlled experiment, but rather as a process of studying and creating to find space and time for experimentation with art and mathematics. Art images are not used in the workshop solely as a means of motivating learning of mathematical concepts or to identify their representation in art. Instead, the process of observing and contemplating art images enables the expression of “visualities”, shaped by culture and discourse over time, and influence how we perceive the world, especially in the context of mathematics (Flores, 2013). This process occurs in the “in between, in the interstice or in the disjunction of seeing and speaking” (Deleuze, 1988/2005, p. 124).

### Body-space-eye

Among the workshops developed by our group, we present an example of a workshop inspired by abstract art, entitled *Colorrítmos* (colors and rhythms) and mapped by Kerscher (2018). The aim of this workshop was to experiment with notions of space, volume, shapes, and geometric solids, as well as colors, sounds, and rhythms, by distributing various materials in small cardboard boxes without imposing predetermined quantities or techniques. Two different sizes of boxes were used, and the

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<sup>1</sup> The poster presented at the conference can be accessed at: <https://gecem.ufsc.br/imagens-do-labirinto/poster/>.

<sup>2</sup> Group of Contemporary Studies and Mathematical Education (GECM). Federal University of Santa Catarina, Brazil. [www.gecem.ufsc.br]

materials used included bottle caps, rice, and stones. This approach allowed for experimentation with ways of dividing, distributing, fractionating, providing, and quantifying.

One of the tasks during the workshop was trying to fit a large, irregularly shaped stone into a smaller, regular-shaped cardboard box. This required us to consider space while searching for the right fit, revealing that mathematical concepts are grounded in sensory and physical experiences of the world and are not merely mental abstractions. It is often assumed that space is a mental construct and that objects occupy specific spaces in the world. This is due to the Cartesian notion that space is an objective, fixed entity, independent of the human body that occupies it. However, Deleuze criticizes this dualistic view of space and advocates for valuing the experience and subjectivity in its construction, as well as emphasizing the political and social dimensions of space as a field of struggle and transformation.

## Final words

There is, thus, a lived experience of mathematics, that occurs through the unique encounters that arise from engaging in mathematical activities with art. This means that understanding mathematical concepts involves physical interaction with materials and objects, as well as with other people, and that this interaction plays an important role in learning and teaching mathematics. Therefore, we have focused our attention on a series of discursive practices that regulate and control the body, eye, thought, and action, revealing the material aspects of mathematical concepts. In summary, all of this prompts us to question, on the one hand, the conventional views of mathematics as abstract and static, the established beliefs regarding the relationship between mathematics and the body (e.g. the dualistic approach between body and mind) and, on the other hand, the canonical ways of doing research that seek to problematize teaching and learning processes in mathematics.

## Acknowledgment

We thank the Brazilian agency, CNPq, for the financial support to the first author.

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