

Projects involving Mathematics and Arts

This file contains a short description of several activities involving Mathematics and Art which I have promoted during the last decade. My name is Andreia Hall and I am an Associate Professor at the University of Aveiro, Portugal.

The Mathematical Circus Project

My most recent project is the Mathematical Circus, a joint project with people from Lisbon. We perform mathematical shows (mainly mathematical magic tricks with a circus flavor induced by the presence of a mathematical clown) in schools or science museums. In this project Mathematics becomes interwoven with the performing arts. More information can be found at <https://www.facebook.com/CircoMatematico/>, <https://circomatematico.wordpress.com/>.



Story-telling with a mathematical flavor

I created a set of stories with some mathematical content coupled with mathematical activities. For these stories I built some scenarios and I went to schools to perform a two-stage activity for children age 5 to 10. First I would tell a story and then I would engage the children in some mathematical activities. Altogether I performed more than 50 sessions. I published a book in 2009 with a couple of these stories.





Professional Development Courses

I have taught several Professional Learning Courses for Primary and High School teachers. All these courses took place at the University of Aveiro and were acknowledged by the national scientific and pedagogical committee for teacher's professional development (Conselho Científico-Pedagógico da Formação Contínua). The ones linking Mathematics and Art are listed next:

2015 --- *Rosettes in every way* (25h: teachers from 1st to 12th grade).

In this course we explored rosette symmetries. Teachers had the opportunity to create two practical projects: one using ceramics and another using patchwork. Some examples:



2014 --- *Lets do patchwork with mathematics: recursions and other topics* (15h; teachers from 1st to 12th grade).

In this course teachers were free to explore several mathematical topics and were asked to create a practical work through patchwork. The photo below shows some examples using recursions (fractals).



2013 --- *Stories with a mathematical flavour* (15h; pre-school and primary school teachers)

In this course teachers were asked to create their own stories involving Mathematics. In this course Literature was linked with Mathematics.

2013 --- *Lets do tiles with mathematics* (25h; teachers from 1st to 12th grade). We did Escher type tessellation. Some examples:



2012 --- *Mathematics, where are you?* (25h; pre-school and primary school teachers)
In this course several mathematical topics were covered. One of them was symmetry and teachers explored the topic with their students. Examples of works performed by students at schools, during the course:



2012 --- *Mathematics in the hands of a potter* (25h; primary school teachers)
In this course primary school teachers had the opportunity to make ceramic pieces with a mathematical content and a practical use for their students. Teachers explored several mathematical games, geometric solids among others. Some examples are shown next.



2012 --- *Looking for the mathematics of patchwork: friezes and wallpapers* (25h; high school teachers)

We explored the 7 groups of symmetry of friezes and the 17 groups of symmetry of wallpapers and performed at least one quilt using each type. Some examples:



2011 --- *Mathematics, where are you?* (25h; pre-school and primary school teachers)

In this course several mathematical topics were covered. One of them was symmetry and teachers explored the topic with their students. Examples of works performed by the teachers (biscuits on the left and paper dough bijou pieces on the right):



Art works through patchwork

I like very much to create mathematical quilts some of which I have already presented at some Bridges Conferences (2010, 2011, 2012, 2016) and a ESMA conference (2016). Some examples:



Squares within a square



Rep-tiles



Voronoi diagrams