# The Art of Looking at Public Art and Architecture with Mathematical Eyes

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*This presentation is based on the ongoing project "The Art of looking at public art and architecture with mathematical eyes" conducted 2018-2019 in Sweden. The project aims to encourage math students to learn math through experiencing and exploring art and architecture in Lund. A second aim is to engage students in discovering the history and culture of their hometown. The session starts with a presentation of the project "Math-Art Walks", followed by an introduction to art, sculptures and buildings near the conference location.*

## Introduction

In 2015, I participated in the ALM22 Conference in Washington D.C. having the theme" Opening Our Math Eyes To See Math In Everything We Do". All the inspiring keynote speeches and presentations I got to take part in opened my "math-eyes" as well. Back in Sweden, I started to work out a project proposal, The Art of looking at public art and architecture with mathematical eyes. I was granted a scholarship from Gudrun Malmers Foundation and a teacher colleague, Bengt Eklund, joined the project that started in 2018.

The project aims to encourage students to see, discover and learn math through art and architecture while learning about the culture and history of their home town. In practice, this is done by "Math-Art walks" with the support of a study compendium that I developed based on the Swedish mathematics curricula (Skolverket, 2012, rev.2017), ZalayaBáez´s (2004) classification of mathematical sculpture, and art history. The relationship between art, architecture and mathematics is expressed in the aims of the mathematics curricula of adult education, compulsory school, and upper secondary school. For example, teaching mathematics in compulsory school should aim at:

> helping the pupils to develop knowledge of mathematics and its use in everyday life and in different subject areas. Teaching should help pupils to develop their interest in mathematics and confidence in their own ability to use it in different contexts. It should also provide pupils with the opportunity to experience aesthetic values in mathematical patterns, forms and relationships. (Skolverket, 2012, rev. 2017).

The upper secondary curriculum in mathematics describe that:

> Teaching should cover a variety of working forms and methods of working, where investigative activities form a part. Where appropriate, teaching should take place in environments that are relevant and closely related to praxis. Teaching should give students the opportunity to communicate using different forms of expression. In addition, it should provide students with challenges, as well as experience in the logic, generalizability, creative qualities and multifaceted nature of mathematics. teaching should provide students with challenges, as well as experience in the logic, generalizability, creative qualities and multifaceted nature of mathematics. (Skolverket, 2012).

My intention with the project is to visualize how integrating local art and culture in formal math education may open, not only "Math Eyes", but "Math-Art-Culture Eyes".

## Method

As my practice is in the city of Lund, I have chosen to focus on public art and sculptures found here. All in all, the project includes 76 sculptures and buildings. To create a structure for the Math-Art Walks, the city has been divided into 20 geographical areas. For each sculpture and building, we have compiled general information about the object and tasks that, as a whole, cover many of the knowledge requirements that the students encounter in their courses. Engaging in a Math-Art Walk requires from an hour up to a day depending on how many objects are included in the walk. I have developed a compendium to be used during the walk comprising a short description of art movements, ZalayBáez´s classification of mathematical sculptures, a set of tasks associated to each sculpture and building, and a response template.

Overall, the first and last task for each sculpture and building are identical. The first task is divided into smaller exercises. In the first, the students have to mention the name of the sculpture or building, who made it, when it was made, if it is site-specific, and what they think the artist or architect wanted to express. For the sculptures, the students also have to describe the art work with words, marking those they find mathematical. They are encouraged to identify the art movement (ism) and to find the mathematics in the object by using ZalayaBáez´s classification. The last task is to formulate a mathematical exercise involving the sculpture or building. In between the first and last task, there are specific tasks with different mathematical content.

## Lessons learned

I would be very grateful for comments that can develop and improve the project as well as your thoughts about if you could bring the concept of the project to your workplace.

## The presentation

The session starts with a presentation of the project and ZalayaBáez´s classification scheme of mathematical sculptures, exemplified with artwork from Lund. After that, I will go into details of one building and two public artworks in Lund whose mathematical tasks include the use of

digital tools. Finally, I will show you a way to put together material for a concluding art exhibition, if you only have a few hours.

## References


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