

THE USE OF GECLA PROGRAM FOR STUDYING PLANE SYMMETRY

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Abstract

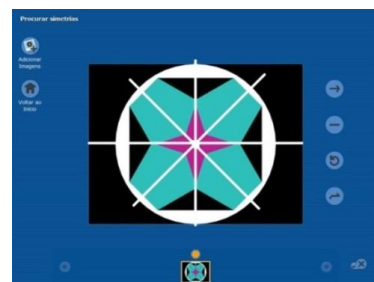


GeCla is an interactive program to generate and mathematically *classify* symmetries, hence its name. It can be useful for teaching a variety of topics on symmetry, and also allows for the possibility of a ludic use, by enabling competitions between students at different educational levels. It attempts to be attractive and accessible to students of various levels of education.

This freeware is available for Mac and Windows – www.atractor.pt/mat/GeCla/index-en.html –, and a tablet version (both for Android and IOs) is being prepared.

The following features are available on the program:

- *Find symmetries*, an interactive search for the symmetries of a given image.
- *Classification*, in which the user is supposed to find all the symmetries of a given image, identifying its symmetry group (among a finite number of possibilities).
- *Generation of rosettes, friezes and patterns* allows the user to create his/her own images: patterns, friezes or rosettes, by choosing one of the different types of symmetry. When saving the images, the program writes encoded information about the existing symmetries in the corresponding image files. Such information can be read, later on, by one of tools of the program, and when the help mode is selected, the user will be warned of possible mistakes in real time.
- *Competition*, one of the interesting features of *GeCla*, allows for the possibility of holding competitions between different teams. This tool has a great didactic potential, as it allows, for instance, the promotion of competitions among students (at different educational levels) from the same school or from different schools, even if they are located in different countries.²



¹ Atractor is a Portuguese non-profit association for the popularisation of Mathematics.

² A competition between Portuguese and Italian students has already taken place.



Atractor designed a version of GeCla for younger students, namely at the Primary School level, the GeCla Mini.

In this workshop, we intend to explore the main features of the GeCla program.

Remarks about the technical facilities

If there is an open wireless system available, the best option would be that the participants take their own laptops with GeCla installed. In this scenario, and for conducting GeCla's competitions, it would also be important to have Dropbox installed on the participant's computers. So, it would be necessary to warn the participants for the convenience of taking their laptops with GeCla + Dropbox to the workshop.

Taking into account that some of them might not bring them, it would be important to have GeCla installed on some computers in the workshop room. To run competitions with GeCla, it is also necessary to have a shared folder among the players. For this purpose, the best solution would be to have Dropbox installed on the computers, so that all participants have access to the same folder.

In order to address the technical issues related to the workshop, I'm available to contact the person responsible for computer management.