Project in Citizenship and Mathematics
Project No. 2017-1-UK01-KA201-036675

Co-funded by the
Erasmus+ Programme
of the European Union

Playing and making mathematical games and crafts: Spaces for coming together

Project in Citizenship and Maths PiCaM

Project Kit description

This activity provides an opportunity to think about teaching and learning mathematics in a different way. It aims to create spaces, inside and outside the school context, for children of diverse backgrounds and abilities to collaborate and share experiences amongst themselves and with others through playing mathematical games and/or making mathematical crafts.

This toolkit includes four tasks: **Explore Mathematical Games or Crafts, Play a game! And make a craft! Become an expert?!, Share your skilfulness** and **Perform your expertise in the public sphere.** The activity requires a combination of small group work, workshop and whole class activity. It creates opportunities for playing and making as part of who we are or could become in our worldviews.

Difficulty level

Intermediate

Key competences

Mathematical, personal, social, civics, digital, languages

Subjects

Mathematics, Number, Geometry, Geography, Art, Theatre, History of civilization

Level

10-13

The eTwinning platform can help students and teachers to share experiences of playing mathematical games and making crafts in their local contexts and explore similar practices amongst youth playing and making cultures across countries.

The activities in this toolkit are from the Erasmus+ Project in Citizenship and Mathematics (PiCaM). This project provides resources to support teachers and teacher educators to develop critical global learning through the learning and teaching of mathematics, opening up creative paces for learners to come together in meaningful mathematical inquiry. Resources for classroom activities, together with guides for teacher professional development, initial teacher education and further eTwinning kits are freely downloadable from the project website: http://www.citizenship-and-mathematics.eu/

Pedagogical objectives

- to create informal curricular spaces where children can realise their responsibilities as critical global citizens
- to engage a diverse population of children with mathematics in their school settings and communities, supporting and reinforcing their sense of themselves as inquiring mathematicians
- to enact ideas derived from Philosophy for Children (P4C) to create opportunities for critical thinking, communication, collaboration and creativity

- to help build classroom relationships which could work towards creating a participatory, caring and inquiring community
- to look for patterns and connections, to become organised and to work in systematic ways
- to recognise the political and ethical dimensions of mathematics (as in creativity)

Orientation Introduction

Explore Mathematical Games or Crafts

Have a number of mathematical games or crafts available for children to experience and explore. Children in small groups choose one game and one craft to focus on in more depth. They spend time in learning how to play the game and make the craft (reading instructions, watching video tutorials and so on) and note down what they have learned.

In addition, using the internet or other sources, they can locate information concerning the cultural grounding or significance of the game or the craft they have chosen. They can also wonder how these games or crafts have changed over the years and how they are being used today, by young people, by the market, in industry, in digital cultures?

Play a game! And make a craft! Refine your techniques! Become an expert?!

The children will concentrate on developing their own skilfulness in playing their game or in making their craft. Allow plenty of time for the children to spend playing, working slowly and carefully so that they capture the details of the movements in rules and patterns and as such to refine their techniques or strategies and develop their skills.

Can you break the rule to change the game?! Having learned the rules or the pattern of the game or the techniques involved in making a craft, children can move into a final stage where they can become bold by breaking the rules and trying to create an innovative game or craft that reflects their own capacity to recreate their own structures!

This can be presented in eTwinning platform orally or visually by telling a story or by making a video as a description of what, how and why. Also, children can create a suitable algorithm that unpacks step-by-step the process and denotes the rules or patterns necessary to be followed.

Communication Collaboration

Share your skilfulness

Being able to perform a refined technique in the context of game or craft is what characterises a skilful expert. In this activity the emphasis is on sharing our expertise with each other rather than using it to compete against others. Invite your classmates for friendly games or craft-making workshops, include experts and novices, try to learn from each other. Invite people from the community who might have some expertise with the games or crafts you encounter and share experiences.

An outcome of this task can be the creation of an exhibition or forum in eTwinning platform presenting small groups experiences.

Perform your expertise in the public sphere

This task focuses on bringing the mathematical games and crafts into the community itself. It involves the creation of hybrid spaces in the public sphere of the urban landscape where children can safely perform and share with others their expertise in playing games or making crafts. You can share your experience using the eTwinning platform or you can organize a common event with your partners.

Evaluation & Assessment

Discuss the experience as a whole and try to help the children identify what new things they have discovered and what these experiences meant for them or how they made them feel. Try to explore how they relate to the mathematics involved in the context of playing games and making crafts. Ensure that children with diverse skills, competences, ideas and participation are being equally celebrated.

Follow up

Learning in this activity can be extended to both younger and older students. For younger students, games and crafts can be carefully chosen to fit the kinaesthetic and cognitive competences of the early years. Emphasis on slowing down the process of playing and making might create problems for some children who might be impatient or cannot coordinate their body movements, use of hands or gestures. In these cases, one may need to mediate to scaffold and facilitate the process. Older children may be able to gain confidence by appreciating the relative connections amongst cultural and cognitive processes as they are all linked in the act of performing the game or making the craft.

This activity is adapted from 'Playing and making mathematical games and crafts', one of 7 classroom activities from the Project in Citizenship and Mathematics (PiCaM). The complete resource for 'Playing and making mathematical games and crafts' is available in the resources section of the PiCaM website http://www.citizenship-and-mathematics.eu/