



## MAPPING OUR WORLD WITH MATHEMATICS

### Project Kit description

The activity explores the history of European colonisation through studying maps and globes. The ways in which representations can intentionally or otherwise mislead is addressed.

This toolkit includes three tasks: **Getting to know the globe and each other**; **Mapping the globe**; and **Which map is best?** It provides opportunities for students to examine global issues, to consider inequalities and to explore the legacy of colonialism. Through engaging with the activities and sharing their responses with students in partner countries they explore their local country in its historical and geographical place in the world through the mathematics of mapping and statistics.

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 spaces 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 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 work towards creating a participatory, caring and inquiring learning community
- to understand how maps as representations of the globe reflect our histories including the history of European colonialism
- to share insights and reflections with children from other countries

### Difficulty level

Intermediate

### Key competences

Mathematical, personal, social, civics, digital, languages

### Subjects

Mathematics/ Geometry, Social sciences, Geography, History

### Level

10-13



## Orientation

## Introduction

### Getting to know the globe and each other

Students get to know the globe, initially through informal, exploratory group discussions, then responding to the prompts: What questions can we ask about what we see? Which of these questions can we use mathematics to explore? They find the original PiCaM project countries Romania, Portugal, Greece, Germany and England on the globe. The globe tells us the relative size of countries, the shape of countries and the relative distance between them.



In small groups, each student is dealt a [statement card](#). With the other ten cards face up on the table, each card is read aloud, with students listening carefully to solve the puzzle and match the cards. Was the result surprising? Students use the globe to check their results and take a photograph of their results.

How far are these countries from each other? Can you use string and the globe to estimate the distance? What can you discover about the countries in your partnership? Students share their questions and their findings on the eTwinning project space, responding to questions from partners.

## Communication

## Collaboration

### Mapping the globe

Explore how maps of the world can both tell us things but also sometimes mislead us. This is linked to when and where they were made and by whom. To make maps, we have to move from a curved surface to a flat one. Why would people want to do this?

Study [six maps](#) (hyperlink to maps). Discuss how each map has been made. For each map, note which properties of the globe are retained and which ones are lost: in what ways is each map **like** the globe and **not like** the globe? Think about lines of latitude, lines of longitude, how near and far countries are from each other, directions, relative sizes and so on. Other ideas can be found in the PiCaM resource [Mapping our world with mathematics](#) (hyperlink to resource). Write down some of the things that you notice.

Discuss when Map 3 was made and by whom and draw out that this was the beginning of European global exploration which later led to colonialism. (The Mercator map was published in 1569 and was used throughout the European colonial period. It shows Europe as much bigger in relation to the southern continents than it really is. It is excellent for nautical navigation because it preserves direction.)

What can we learn from Map 5?

What is special about Map 4, the Peters map? It was published in Germany during the 1970s and is promoted by UNESCO. It preserves area so countries and continents are more realistically portrayed. Use the video at <https://www.good.is/articles/map-of-the-earth-is-kind-a-wrong> which shows some powerful images of the limitations of the Mercator map and shows clearly how the



map affects our perceptions of the world. You can compare the size of Greenland and India on a globe and then notice the difference in how their size is represented by the various maps.

What does Map 6 tell us about our assumptions? Does Map 6 make you think about the world differently?

### Which map is best? Think, commit, justify, reflect

Which do you think is the best map? Take time to think on your own and make a decision. **Think** about which is best and **commit** yourself to an answer.

Choose six places around the classroom and designate them Map 1, Map 2 and so on. Ask the children to move to the place for the map they have decided is the best. At each location, the children discuss why they think their choice of map is the best. They then **justify** their choice to the rest of the class. The children share ideas and listen carefully to each other. Now **reflect**. Does anyone want to change their mind? Write down your final choice and the justifications for your choice. They can share their choices and the reasons for them with eTwinning partners. This may lead them to **reflect** again.

### Evaluation & Assessment

Ask the children to discuss in groups what they have learnt from the project and to share this with the whole class. Each child should then write or draw or photograph about something they have learnt. The group then combine these to make a poster. Alternatively, you may wish to create a P4C discussion using the overall project as the initial stimulus: what questions arise for you from the Mapping our world with mathematics project?

### Follow up

Possible extensions are: exploring further questions raised by examining the globe in the first task; studying the history and current state of a chosen colony following discussions in the second task; studying the history of the nation state and discussing groups marginalised by the concept, for example, in Europe the Roma and the Sami; representing the data from the third task in other ways, for example, by pie charts.

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