

**Teaching and Learning
with Living Heritage**

**A Resource kit for
teachers**

Traditional decorative patterns in mathematics classes in Poland

Age of students: 13 years old

Poland is rich in decorative traditions involving motifs and ornaments, often seen on traditional costumes and objects around the home. By researching regional variations of these patterns and comparing them to local ones, students were introduced to different ICH elements. These were then used as examples to teach about symmetry during mathematics class.

Learning objectives

Mathematics: Teaching students about symmetry, with a focus on:

- ▶ Identifying symmetrical figures;
- ▶ Drawing axes of symmetry;
- ▶ Explaining why a figure is or is not symmetrical.

Objectives related to the ICH element:

- ▶ Understanding and appreciating the regional diversity of patterns and techniques used to decorate objects and clothes ;
- ▶ Raising awareness of the importance of safeguarding ICH.

Preparation

Description of the ICH element and the way it is practised today:

Traditional costumes (*stroje ludowe*) in Poland vary by region. They are not worn in daily life but rather on special occasions such as festivals, marriage ceremonies and religious holidays. The rich decorations of the costumes and other home objects reflect different regional identities and social statuses. The ornaments are made using various decorative techniques including embroidery and painting. The school project introduced patterns from four regions in Poland - Kaszuby, Lowicz, Podhale and Lubelszczyzna.

Linkages between the ICH element and the school subject:

Traditional costume ornaments usually include symmetrical plant-related and/or geometric designs, meaning that students could be taught about symmetry by examining the patterns in traditional regional costumes.

Involvement of learners in the preparation of the activity:

Prior to the lesson on symmetry, students conducted online research and examined the literature available to learn more about different traditional costume patterns. They also interviewed family members about traditional objects they had at home and the meaning of the specific patterns used in their decoration. Students brought the patterns they identified to school and gave a presentation in front of the classroom about the origin of the pattern they had chosen and the story behind the specific costume or object.

Involvement of bearers and local community in the preparation and/or implementation of the activity:

A local folk group, Leszczyniaczy, was consulted during the research phase. The members informed students about traditional patterns, embroidery techniques and the distribution of patterns across different regions. Most importantly, students interviewed family members about traditional objects found at home and their patterns, which served to strengthen intergenerational dialogue and ICH transmission.

Description of the activity

After conducting research online and consulting a local folk group, the teacher realized that the majority of the traditional ornaments are symmetrical, making them ideal for a mathematics class. She divided students into four groups and had them study traditional patterns from four selected areas of Poland (Kaszuby, Lowicz, Lubelszczyzna and Podhale regions). Students examined publications in print and on the internet, including online videos. The task was to respond to two questions: First, what kind of patterns come from each region? Second, students were asked to identify the objects, plants and colours that made up the patterns. The pupils were then invited to bring a picture or a drawing of a pattern of their choice and present the findings of their research to their colleagues at school.

Each group presented their findings and showed the region in which the patterns are used on a map of Poland.

3 After acquainting students with these specific figures, the teacher introduced the concept of symmetry, axes of symmetry and symmetrical

figures. Students were asked to practise by working on the patterns they had brought and the teacher's copies. They gave examples of shapes with no axis of symmetry and ones with one or multiple axes of symmetry. For each pattern, students determined whether they were symmetrical, drew the axes of symmetry and found the geometrical figures contained in the patterns, identifying them by their English names. Students also wrote the formulas for the areas of selected patterns.

Then, as homework, students were asked to find a traditional object with a specific pattern at home and to learn as much as they could about it (what was it used for, how long it had been in the family, the meaning of the pattern, etc.). They then recorded a short video about it or produced a poster or presentation on the object. Students who couldn't find an object at home designed and drew their own patterns inspired by examples from the classes.

The results were exhibited in the main school hall for all students to admire and learn about regional traditions in decorating objects and clothes.

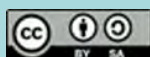
Learning outcomes

The evaluation of the learning objectives was conducted using a test on symmetry and geometrical shapes and in a group discussion in which students were asked to reflect on the activity. Students discussed what they learned about their family traditions. In general, students found that learning with ICH was very useful since

it involved a creative approach and allowed them to connect to their family stories. Thanks to their motivation, the activities accomplished all of the curriculum objectives while raising awareness of the importance of appreciating and safeguarding decorative traditions in Poland.

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