Activity

- *Paving* -

Educational Goals

- Observe and create friezes and pavings
- Become aware of the presence of mathematics in arts

Key Feature of the Targeted Competency

- To mobilize and apply concepts and processes appropriate to the situation (C2)

Concepts Used

- Isometric figures
- Observing and producing regularities using geometrical figures
- Observing and making pavings using reflection and translation

Materials

- Escher's paving illustrations
- Graph paper
- Crayons
- Ruler
- Scissors
- Premade shapes (optional)
- Craft cardboards (optional)

Targeted Academic Levels

Elem Cycle Two Cycle Three

Targeted Competency

C2

Mathematical Field Concerned

Suggested Teaching Formula

Time Required
Approximately 30 minutes

Suggested Process

Step 1: Introduction (5 minutes)

Briefly present to the students the artist M.C. Escher: he is a Dutch artist who was born in 1898 and died in 1972. He worked and lived in Italy and Switzerland, among others. He had started studying architecture but stopped relatively early to specialize in visual arts. Escher used mathematics a lot to create artworks. He is well renowned for his numerous pavings and paintings representing impossible constructions and worlds.

To give the students an idea of this artist's creations, show them a few pavings among the ones you will find on his official website (http://www.mcescher.com/gallery/symmetry/).

Step 2: Creating pavings (20 minutes)

In order for the students to create their own paving, ask them to choose shapes, then to draw them, placing them side by side to completely cover a sheet of paper. Careful, there should not be blank spaces in between the shapes! Ask them to colour their shapes, making sure their creation is symmetrical. To start with, suggest simple shapes such as squares and triangles. However, the more skilful ones can also try to use abstract shapes or animal shapes, as Escher did in his work.
An interesting variant could be to use shapes cut out of cardboard that the students could glue on a sheet, putting them together.

We suggest that you take pictures of your students' creations and send them to us. We are curious!

Step 3: Reviewing the activity (10 minutes)

To review the activity, ask the students to present their paving and explain how they did it. Enumerate with them places of everyday life where we can find pavings: ceramic, floors, wallpaper, fabrics, etc.

To go further…

You can use envelopes to make the pavings: take a closed envelope and draw a line that links the four corners of the envelope, then cut following this line and unfold the envelope. The shape created can be used as a base for a paving.

Short on Time?

Here are some suggestions for an "express" creation:

→ Choose a paving example on M.C Escher's website and ask the students to reproduce it.
→ Prepare cardboard shapes already cut out that the students will only have to put together or patterns printed onto sheets that the students will only have to cut out and put together.
→ Ask the student to complete a paving already started (printed) on a sheet.