Symmetry

Topic: Symmetry

Subjects: art, computer science, mathematics

Age: 12 - 16 years

Duration: 1x mathematics, 1x nature education, 1x art education, 1x informatics

Markwords: symmetry, image processing, sighting in nature

Summary: Students learn to notice symmetry in nature, are able to draw by reflecting both in mathematics and a little more creatively in an art class. Finally, thanks to simple image processing, the student will know what he or she would look like if his or her face were symmetrical to the left or right. Many pictures, drawings and posters for the exhibition will be prepared for joint discussion.

List of materials, environments and tools: smart device or camera for imaging, computer imaging, art tools,

Detailed description of the activity, covering both teaching and learning activities:

In mathematics, the topic is studied with symmetry and reflection in a straight line, drawings are made in a notebook, etc. The science lesson explores where we can find symmetry in real life. Students must also look for and photograph symmetrical objects on their way home. They are added to a common web board or sent to the teacher, who prints them out and adds them to the billboard / poster. In the art class, drawing is also done on the themes of symmetry, again on the wall for an exhibition. Finally, it is examined whether the human face is also symmetrical. So for an IT lesson, you have to take a portrait of yourself and start processing it. The image should be taken on a solid background or used in a program / environment to remove the background (eg https://www.remove.bg/). In a canva (etc.) environment, the student creates a poster to which he or she adds a portrait image, which is copied and pasted twice more. One image remains the original, it is not changed. For the rest of the images, the left side of the image is cut off to the left of the imaginary symmetry axis, and the right side is cut off. Then the remaining half should be copied, mirrored in the opposite direction and moved as close as possible to the remaining half to create a smooth face. In this way, it is possible to see if and how much the student's face would change if it were exactly symmetrical. In addition, other visual elements must be added to make the poster eye-catching, but not obscure the purpose. The completed works will also be added to the exhibition. All together, you can explore and discuss each other's pictures, for example, whose face has changed the least, who has the most, and so on.

Learning objectives:

● the student describes what symmetry means, where it can be found whether the human body is symmetrical

● the student develops his / her digital technology skills

Assessment guide: each subject teacher chooses whether and how to assess.

Suggestions for the facilitator: The subject teachers really enjoyed the activity. Easy to plan, quick to carry out, but the end result was very exciting.

Author and Contact: Gätlin Juhken, gatlin.juhken@ruhnu.edu.ee