Exploring Geometrization in Arts

Integration

21st Century Theme: Global Awareness

Concepts for STEAM Disciplines	**Mathematics** Polygons Spatial reasoning	**Science Education** Environmental awareness Sustainability
	Technology GeoGebra	**Arts** Geometrization in arts

Prerequisite Knowledge

Mathematics
Geometric concepts such as polygons, symmetry and spatial reasoning.

Science Education
Basic understanding of environmental sustainability and the importance of recycling.

Information Technologies
Basic use of GeoGebra.

Arts
Basic colour theory concepts such as primary and secondary colours, complementary colours and colour schemes.

Learning Outcomes

Grade Level: 11- 14 years old
Duration: 250 minutes

Learning Outcomes for Mathematics
Understand and apply geometric concepts such as polygons and symmetry in the creation of their artwork.

Learning Outcomes for Science Education
Understand the importance of environmental sustainability and the use of recycled materials in art.
Explore how geometry and symmetry are applied in the natural world and in technology.

Learning Outcomes for Information Technologies
Use graphic design software such as GeoGebra to create digital artwork.
Combine photography skills with digital tools to create artwork

Learning Outcomes for Arts
Use recycled materials to create sustainable artwork.

Real Life Situation

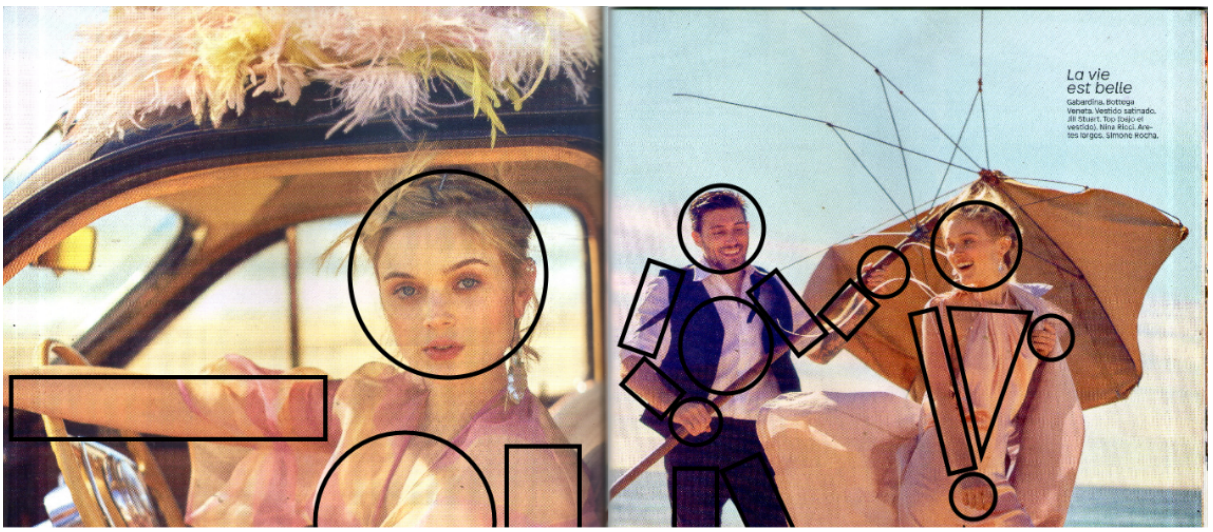
Problem Situation
The school has received an invitation: 'Create sustainable art using recycled materials and geometric shapes. Showcase your vision for a better world at our community-wide exhibition.' Let's get to work!

Materials

- GeoGebra software
- Computers or tablets with internet access
- Rulers or measuring tools
- Recycled materials such as cardboard, paper, plastic bottles, or cans
- Scissors
- Glue
- Paint or markers (optional)
- Cameras or smartphones

Resources
https://www.behance.net/gallery/19857215/The-Cow-Study-
Pictures at the end of this document

STEAM Activity	**Ask** In the first class, the teacher will introduce the concept of sustainability and its importance in our daily lives. Use real-life examples such as recycling, reducing waste, and conserving energy to help students understand the concept. The teacher will start a discussion with the students about: ● Ask students to brainstorm and share their ideas about what sustainability means to them and why it is important. ● Encourage a class discussion about the impact of human actions on the environment and how we can make a positive difference through sustainable practices. ● Ask students to reflect on their own behaviours and identify ways they can contribute to sustainability efforts in their homes, schools and communities.
	Research As part of their research, they will be asked to look for examples of sustainable art created using recycled materials and geometric shapes. They will also be gathering information on the history and techniques of geometrization in art. In preparation for the project, students are encouraged to bring in a photograph or select an image that they want to geometrize.
	Imagine The teacher will facilitate a group discussion where students will be asked to share their understanding of the concept of geometrization in their own words. They will be encouraged to discuss any examples of geometrization they have seen or heard of and share the photographs they have brought in for the project in a digital format. The teacher will guide the discussion to ensure that all students have a clear understanding of the concept and provide additional examples if needed.
	Plan Using the GeoGebra software, the students will import their chosen photograph or image and use the polygon tool to create at least three different polygons of their choice over the image. They will experiment with different polygon shapes and colour schemes to create their own unique geometric art based on their chosen photograph.
	Create After completing their assignments, the students will print them out and use different recyclable materials to create their own works of art by decorating them.
	Test The students will hold an exhibition showcasing both the original photo and their newly created artwork. Additionally, they will give a brief presentation on the recycled materials used in their projects
	Improve For this activity, the teacher may select images where symmetry is a prominent element, or choose more complex images for the students to work with.
Materials	This part will be decided by the teacher and students according to their ideas
Test	This part will be completed by the teacher.
Improve	This part will be completed by the teacher after the lesson plan is implemented in the classroom.



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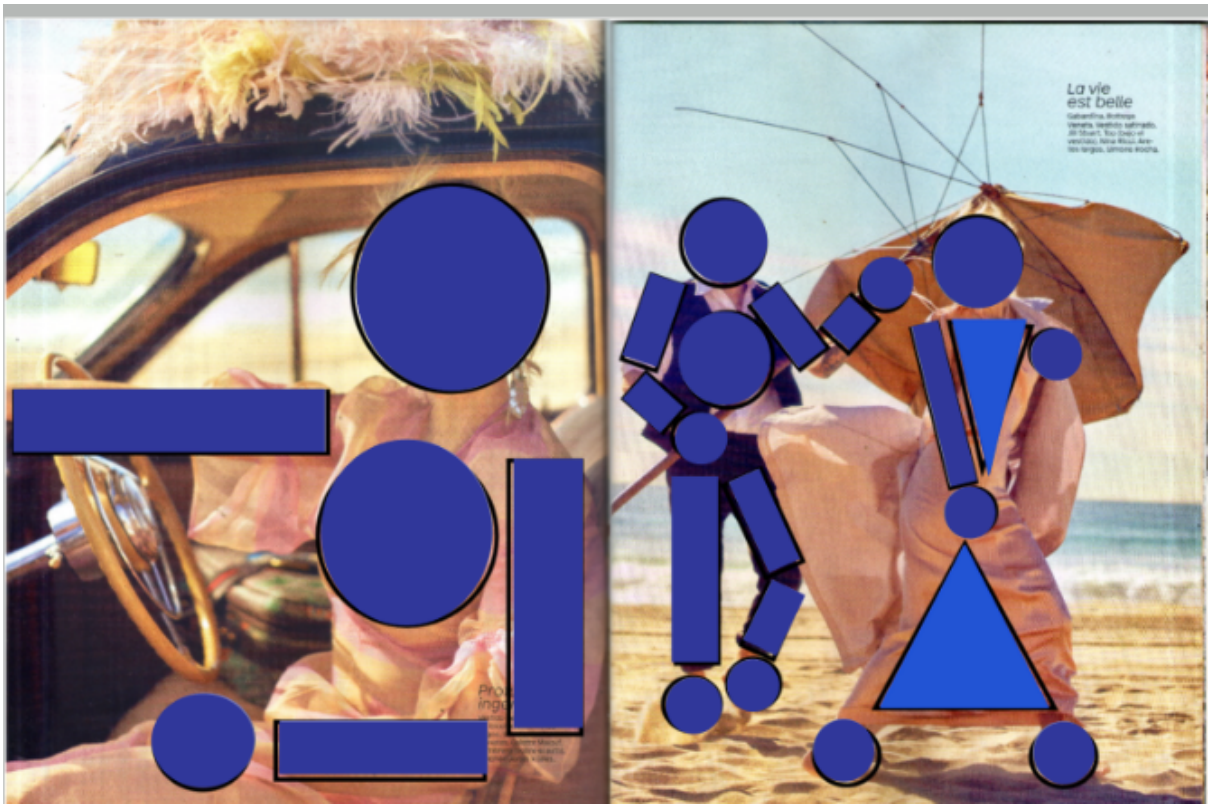

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https://artperceptionslab.com/es/1280px-doesburgcow-2/