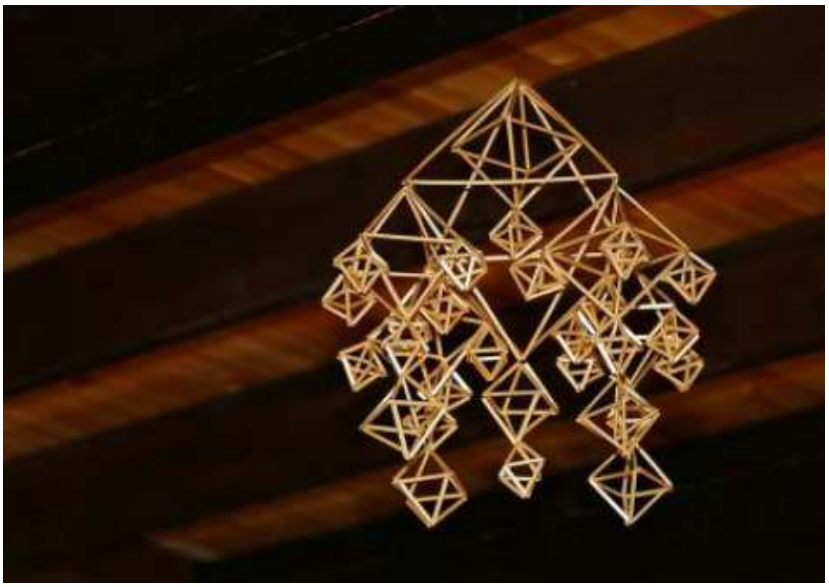
The Hidden Item / Exploring Geometry and Cultural Heritage with Himmelis and 4Dframe / Platonic Solids and Finnish Himmelis: A STEAM Approach

(description)

This 3-hour workshop aims to blend mathematical concepts with Finnish cultural heritage, focusing on the construction of himmelis using Platonic solids. Utilizing the 4Dframe toolkit, participants will engage in a hands-on, experience-oriented activity that bridges the gap between mathematics and traditional Finnish art, fostering a deeper appreciation for both.

A himmeli is a traditional Finnish ornament that is typically hung above the dining table during the holiday season, especially Christmas. The word "himmeli" derives from the German word "Himmel," meaning heaven or sky, reflecting its ethereal, skyward-reaching design.

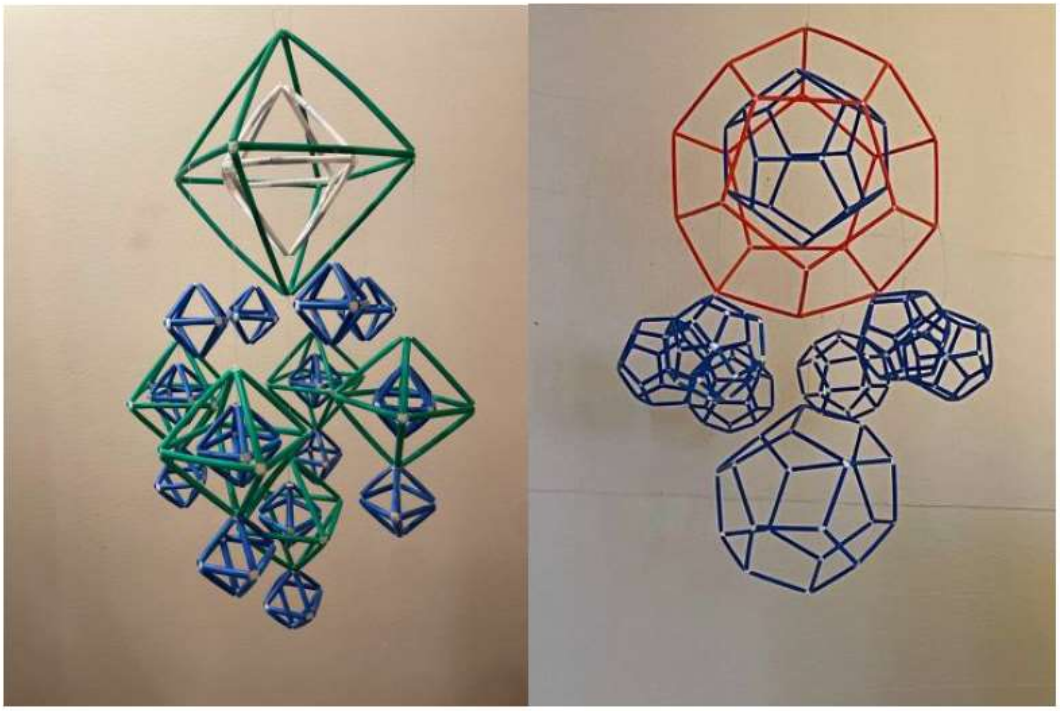


Historically, himmelis were made from natural rye straw, meticulously cut into uniform lengths and threaded together to create elaborate, symmetrical geometric shapes. These structures range from simple designs to highly intricate, multi-tiered forms, showcasing an array of geometric patterns that play with light and shadow. The complexity and size of a himmeli were often seen as a symbol of the maker's skill and patience.

In addition to their decorative purpose, himmelis were traditionally believed to bring good luck and ensure a bountiful harvest in the coming year. They were typically hung during the winter and left up until Midsummer to bring prosperity to the household.

In modern times, the making of himmelis has seen a revival as both a cultural craft and an artistic expression. They are now made using various materials like modern straws, metal, and wood, transcending their traditional roots to become a versatile element in contemporary home décor. Himmelis continue to be a cherished part of Finnish heritage, symbolizing craftsmanship, beauty, and a connection to nature and the past.

In this workshop design we recommend to use Experience Workshop's 4Dframe STEAM toolkit, but it can be substituted with the above mentioned traditional materials:



Description of Activity

Participants will engage in a step-by-step process of constructing Platonic solids using the 4Dframe toolkit. After mastering these basic geometric forms, they will progress to creating more complex structures inspired by traditional Finnish himmelis. The activity encourages exploration, creativity, and discussion about the intersection of mathematics, art, and culture.

Lesson Outline

- Introduction (30 minutes): Overview of the workshop, STEAM education, and the significance of Platonic solids and himmelis in Finnish culture.
- Hands-On Activity (90 minutes): Guided construction of Platonic solids followed by himmeli making using the 4Dframe toolkit.
- Reflection and Discussion (30 minutes): Sharing of creations, insights on the learning process, and discussions on the cultural and mathematical aspects of the activity.
- Wrap-up (30 minutes): Summary, feedback, and potential applications of the concepts learned.

Additional Documents

- A detailed guide to Platonic solids and their properties.
- Historical and cultural background of Finnish himmelis.
- STEAM education resources and references.
- Source of this workshop content: Piila, E. Paying Homage to Folk Art Using Platonic Solids.

Goals

- To understand the geometric principles of Platonic solids.
- To learn about the cultural significance of Finnish himmelis.
- To develop hands-on skills in constructing geometric shapes using the 4Dframe toolkit.
- To appreciate the interplay of mathematics and art in cultural expressions.

Workshop Outputs

- Individual or group-constructed himmelis.
- A brief presentation or reflection on the cultural and mathematical insights gained.

Required Materials

- 4Dframe toolkit (plastic straws and connectors).
- Reference images and diagrams of Platonic solids and traditional himmelis.
- Instructional guides for basic himmeli construction.
- A brief history of himmelis and their cultural significance in Finland.

Additional Notes

- The workshop should be interactive, with facilitators encouraging dialogue and sharing of ideas among participants.
- Consider the diverse backgrounds of adult learners and adjust the content to suit varying levels of familiarity with mathematical concepts.
- Emphasize the cultural transfer and international relevance of traditional Finnish himmelis, highlighting the universal language of mathematics and art.
- This lesson plan caters to adult learners, offering an engaging and culturally rich experience that connects mathematics with Finnish folk art, fostering a deeper understanding and appreciation of both.

STEAM Category: Mathematics / Art / Cultural Heritage

Source of images: Erna Piila's paper Paying Homage to Folk Art Using Platonic Solids