

**EXPERIENCE WORKSHOP**



**THE EXPERIENCE-CENTERED  
MATH/ART MOVEMENT**  
[www.experienceworkshop.org](http://www.experienceworkshop.org)



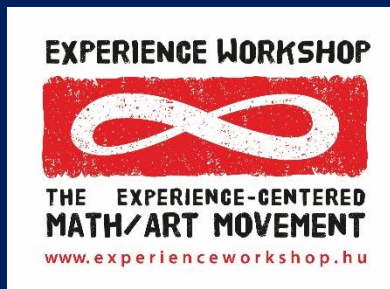
# Experience Workshop's STEAM Learning Material

## EXPERIENCE WORKSHOP'S 4DFRAME SIERPINKSI TETRAHEDRON

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University of Jyväskylä

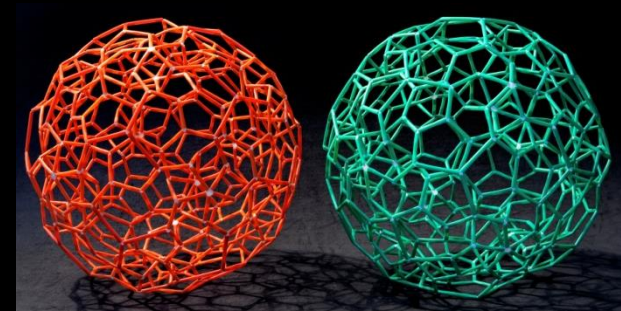


Co-funded by the  
Erasmus+ Programme  
of the European Union



# Introduction of 4D Frame

For Free Imagination and Infinite creativity



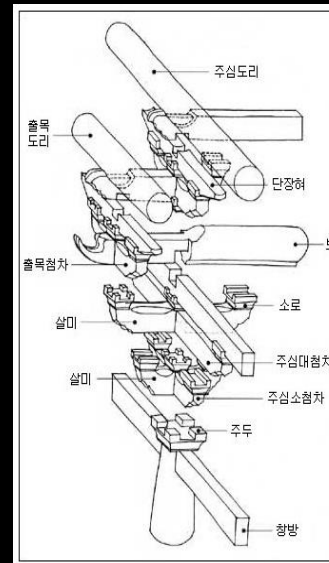


The 4Dframe educational modelling kit is based upon the analysis of building techniques utilized in the construction of Korea's traditional, wooden buildings, in which no any nails have been used.

- ❖ 4Dframe has been proved to be a very appropriate tool for developing various skills in the transdisciplinary framework of STEAM learning.



Traditional Korean Wooden Palace



Principle of Architecture



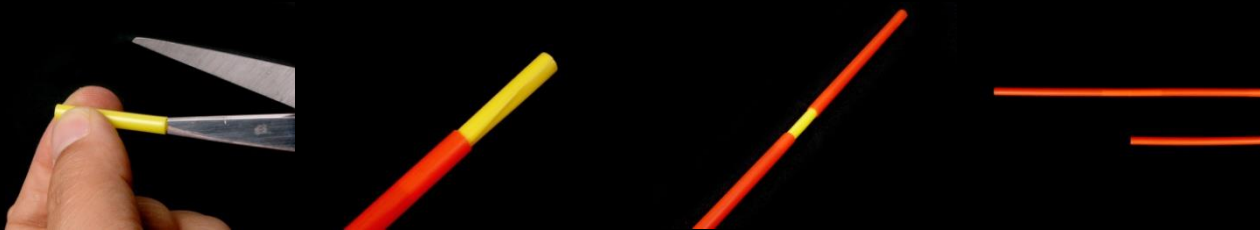
4D Frame Tube



4D Frame Connector

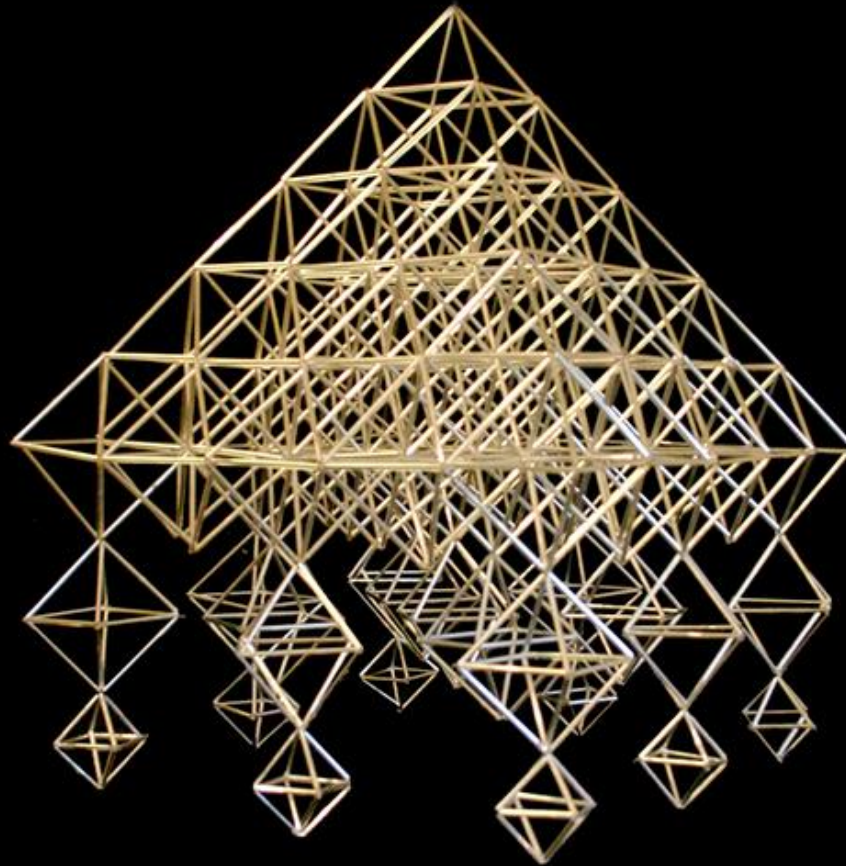


Bend, Cut & Connect!





(주) 포디랜드·포디창의연구소



The traditional Nordic  
christmas decoration:  
the himmeli

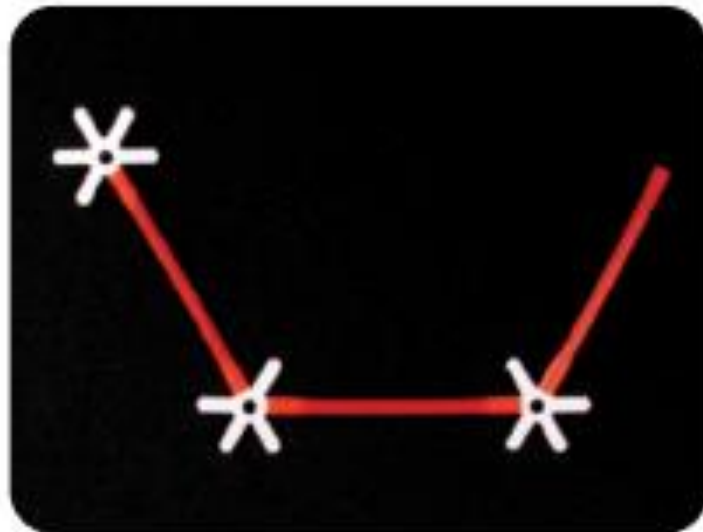




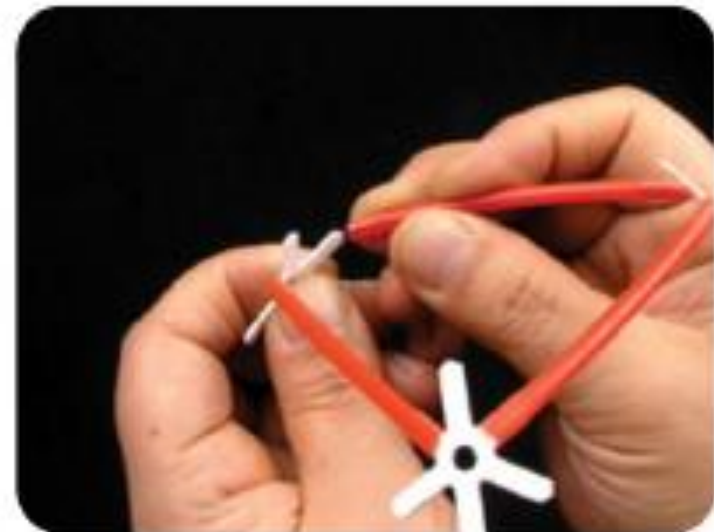




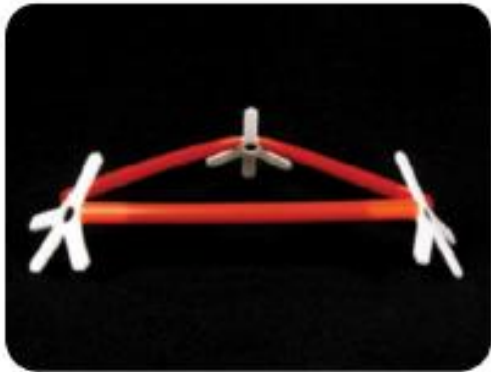




- ① Join three 7cm frames with three 6pods as shown.



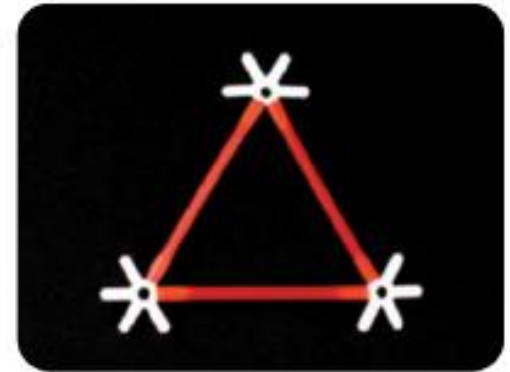
- ② Join the open end to form a closed triangle. As you join, leave a foot in between.



③ At each vertice, one foot should face upward and three feet downward as shown

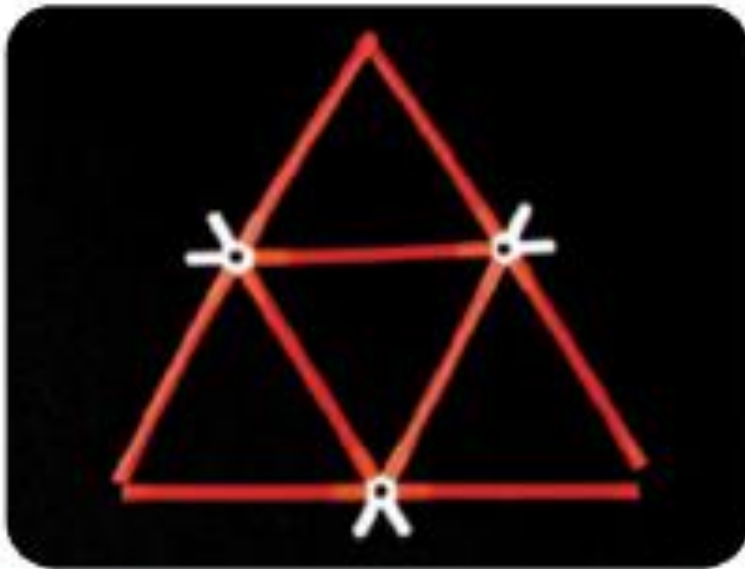


④ With ③ at the center, join frames to all the remaining feet of pods

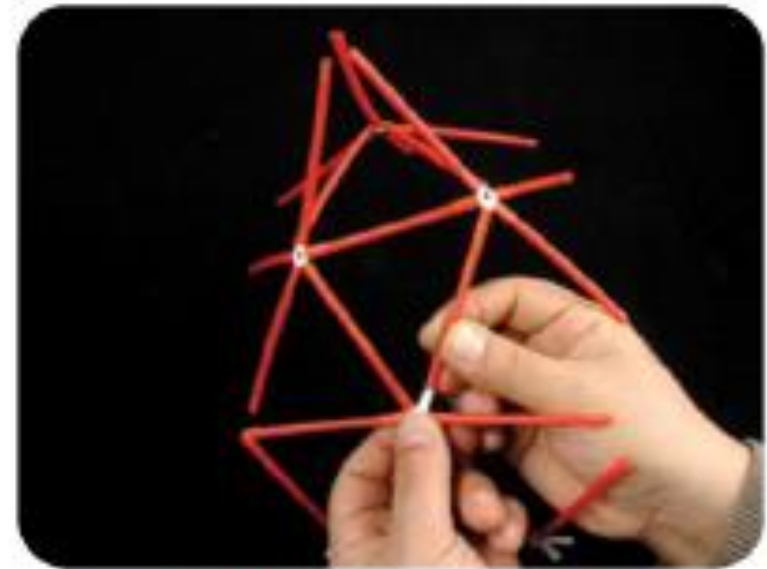


⑤ Make another triangle just like ④.

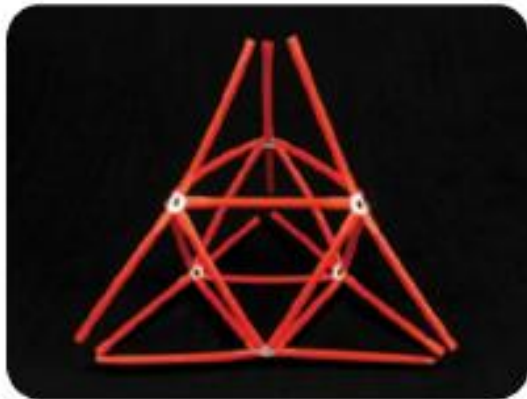




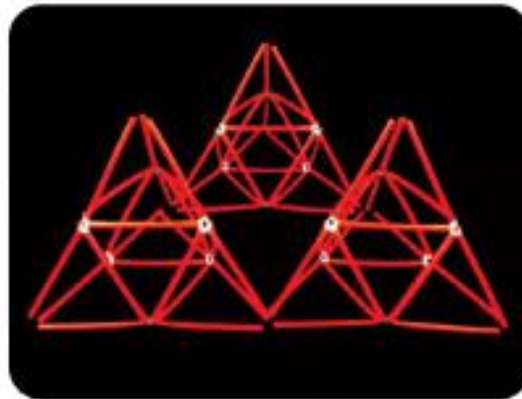
⑥ With ⑤ at the center, join two frames at each vertex to make three more open triangles around,



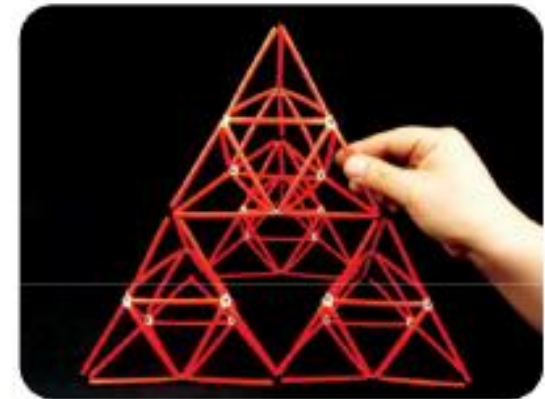
⑦ With ⑤ at the base, join ④ to the top,



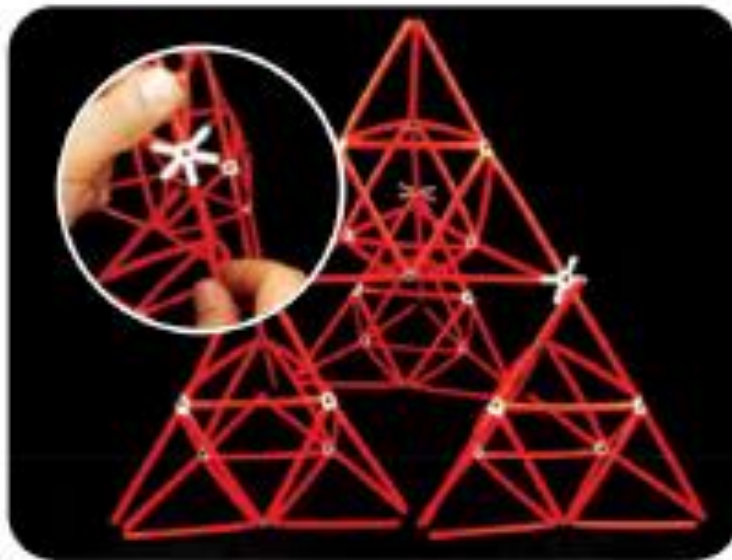
⑧ The first phase of Sierpinski is now complete! The open vertices will be joined later.



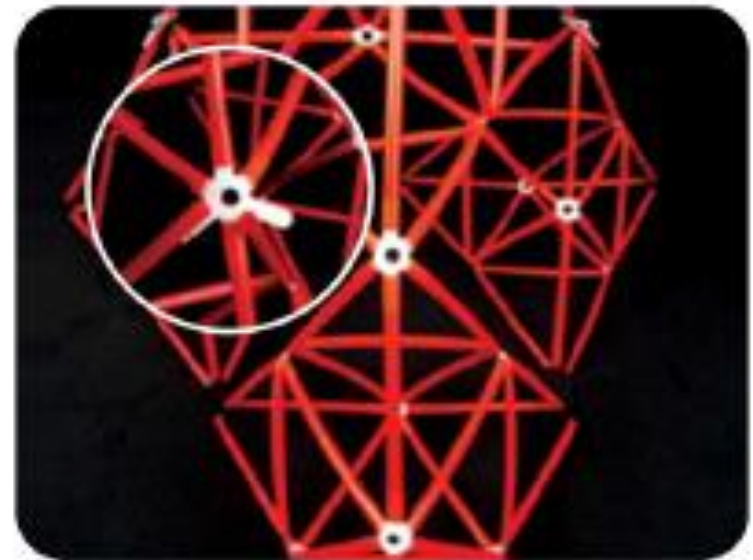
⑨ Make three more these sets of ⑧.



⑩ Arrange the four structures from ⑨ as shown.

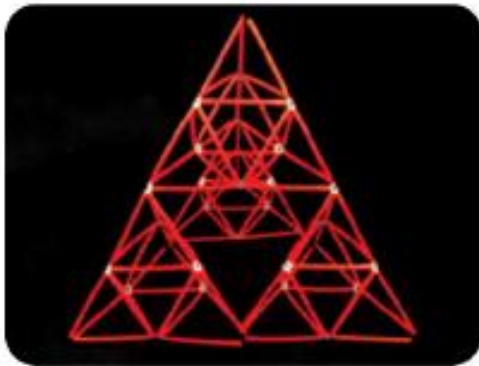


⑪ Join the open ends by using 6pods.

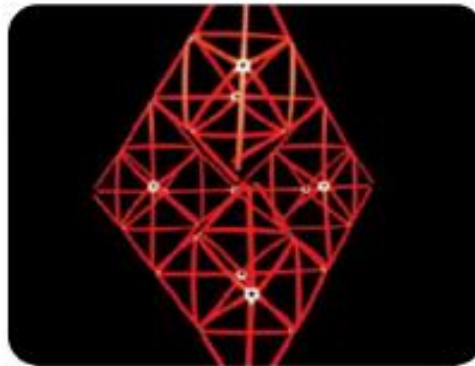


⑫ Join all open frames in open feet of pods on both the first floor and second floor so that no foot remains unattached.

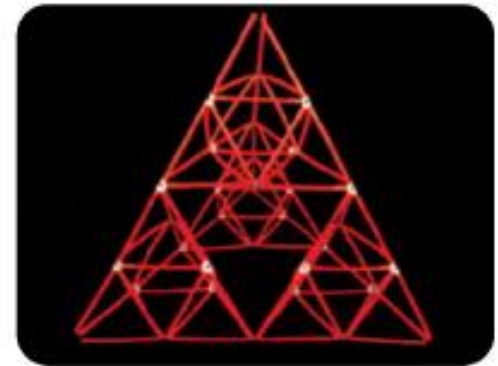




⑬ Now all are connected,

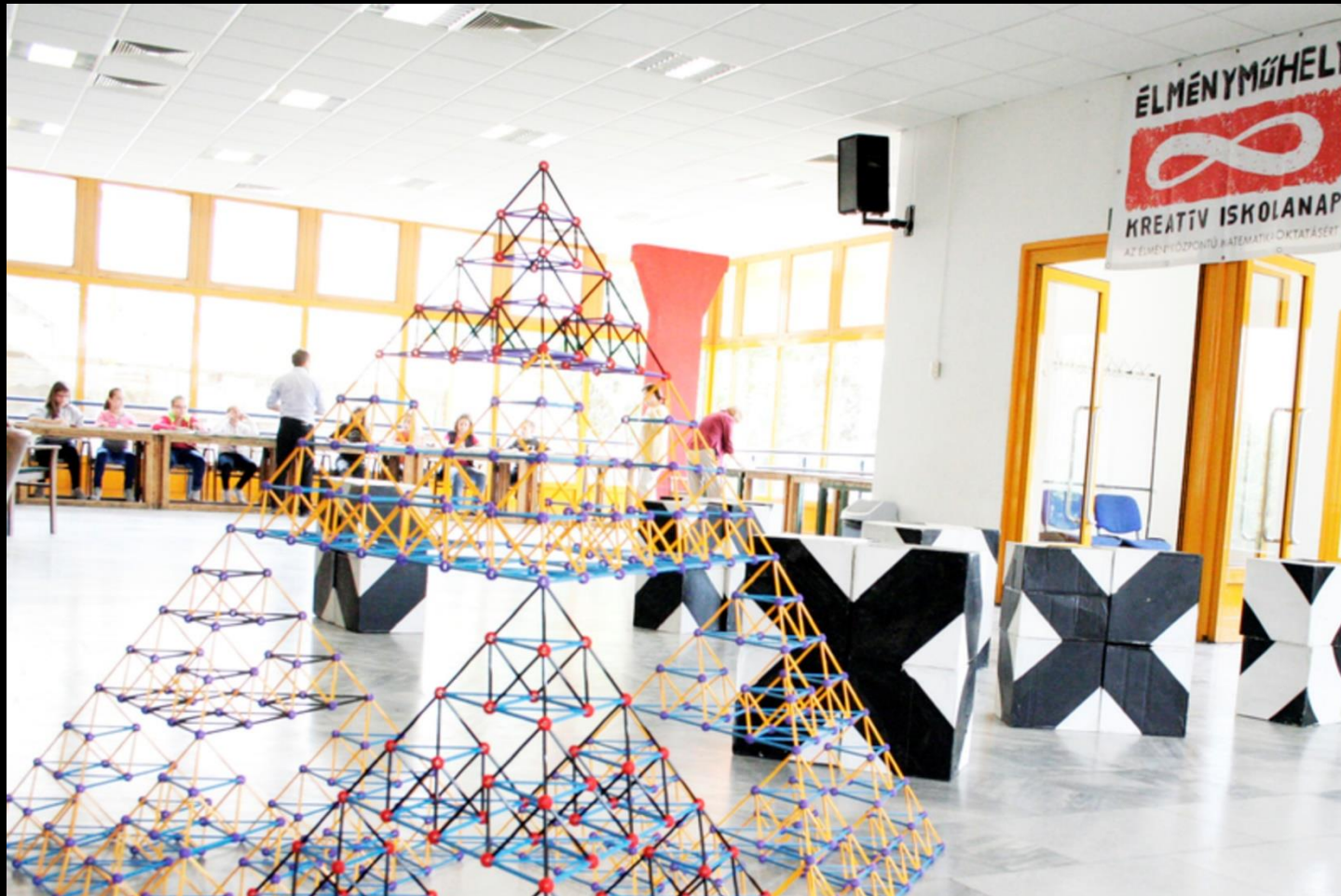


⑭ Turn around the base and connect the remaining open frames with open pods,



⑮ The second phase of Sierpinski is now complete! And you can also continue on in the same way to build the third and fourth phase of Sierpinski triangle,



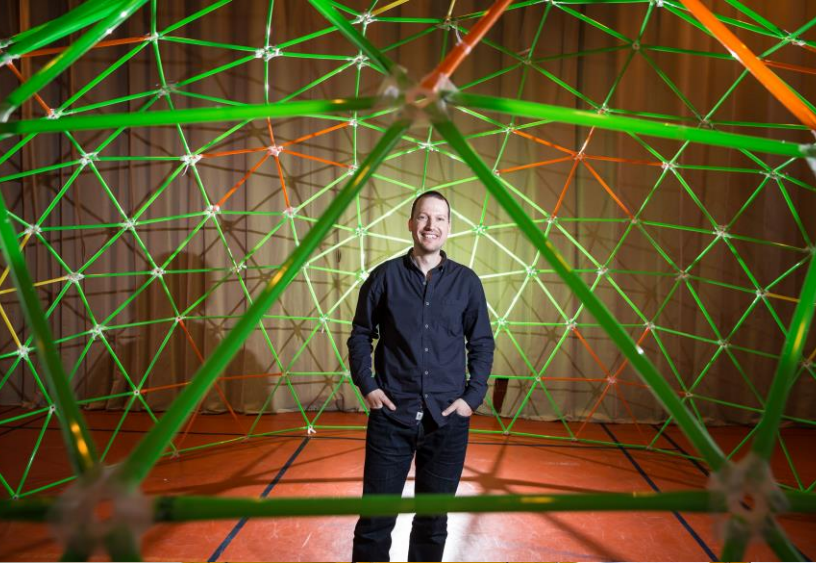




Work in pairs or in small groups! Work as a team of engineers!

You need to solve a given problem within a given amount of time, based on a given amount of resources:

- Set goals
- Make plans
- Do tests
- Record the thinking / design process
- Do more with less



Interested in STEAM? Looking for support in connecting mathematics & art in education? Do you have a good idea?

Contact us: [info@experienceworkshop.org](mailto:info@experienceworkshop.org)

Website: [www.experienceworkshop.org](http://www.experienceworkshop.org)

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