

EXPERIENCE WORKSHOP



**THE EXPERIENCE-CENTERED
MATH/ART MOVEMENT**
www.experienceworkshop.org



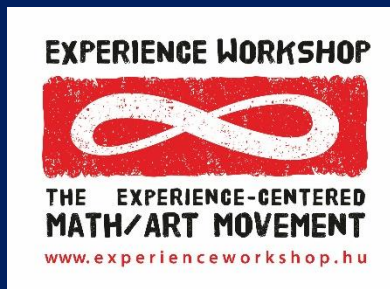
Experience Workshop's STEAM Learning Material

4Dframe SNOWFLAKES

Dr. Kristóf Fenyvesi
University of Jyväskylä

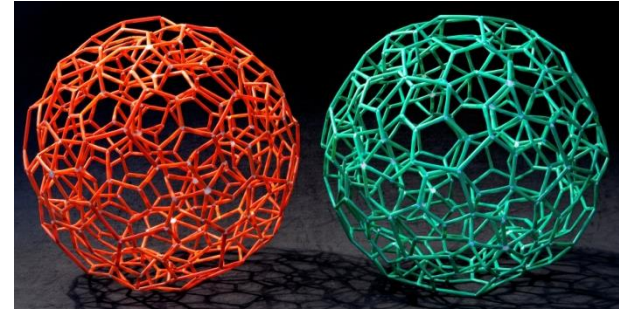


Co-funded by the
Erasmus+ Programme
of the European Union



Introduction of 4D Frame

For Free Imagination and Infinite creativity

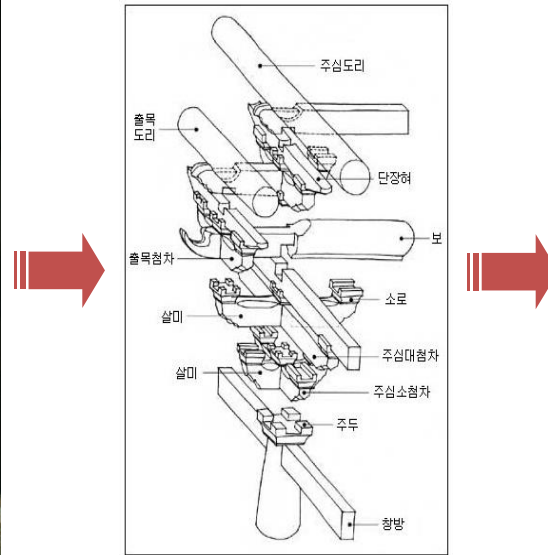


The Brand : 4D Frame

- ❖ 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

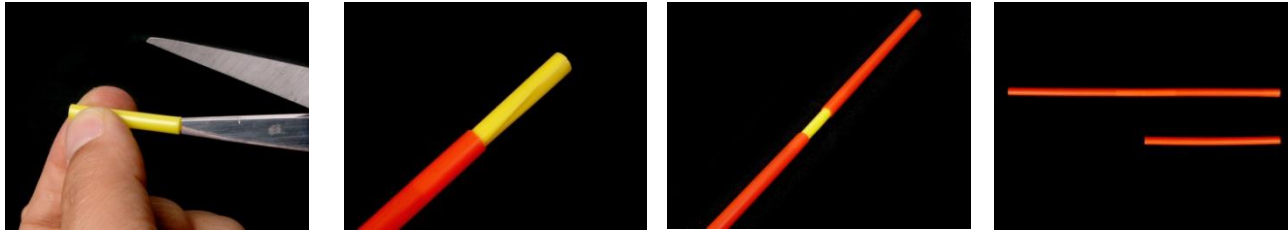


4D Frame Connector

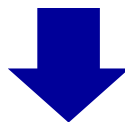
Character : Flexibility



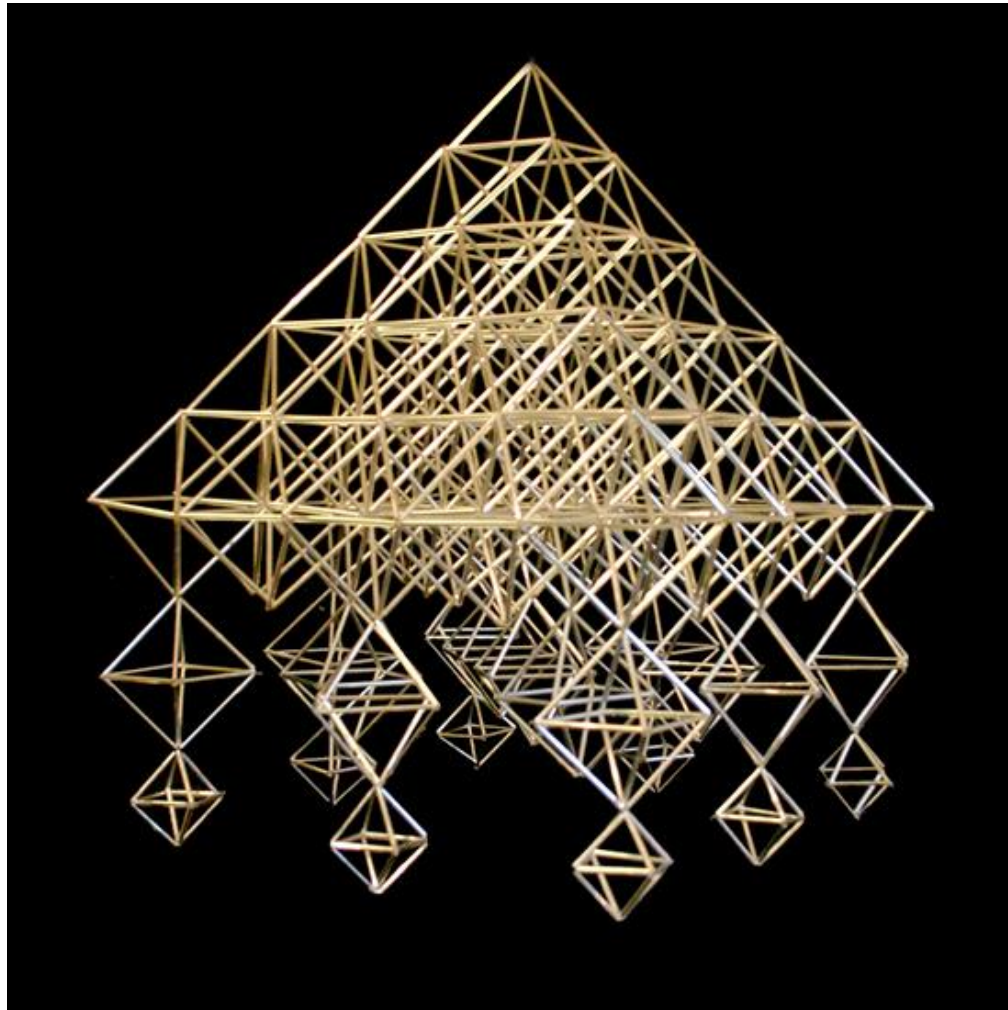
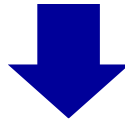
Bend, Cut & Connect!



Character : Infinite Expansion

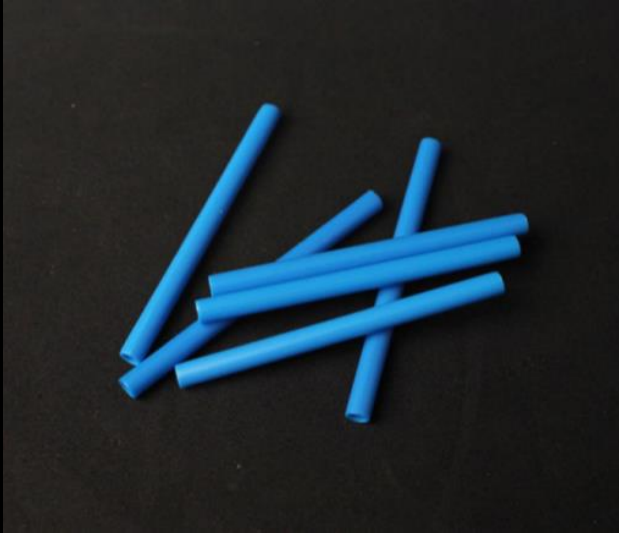


Character : Infinite Expansion



The traditional Nordic
christmas decoration:
the himmeli





Tubes



Connectors

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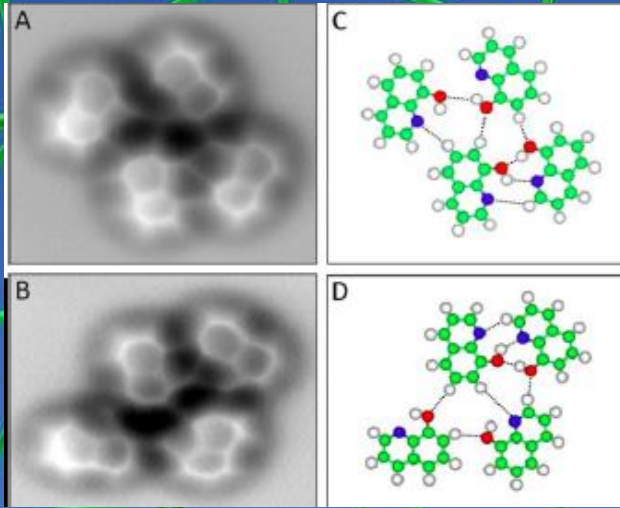
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VISUALITY & MATHEMATICS

EXPERIENTIAL EDUCATION
OF MATHEMATICS THROUGH
VISUAL ARTS, SCIENCES
AND PLAYFUL ACTIVITIES



You can use 4Dframe to simply represent the water molecule (H_2O) and explore its features in different chemical structures.



미래융합창조문화재단

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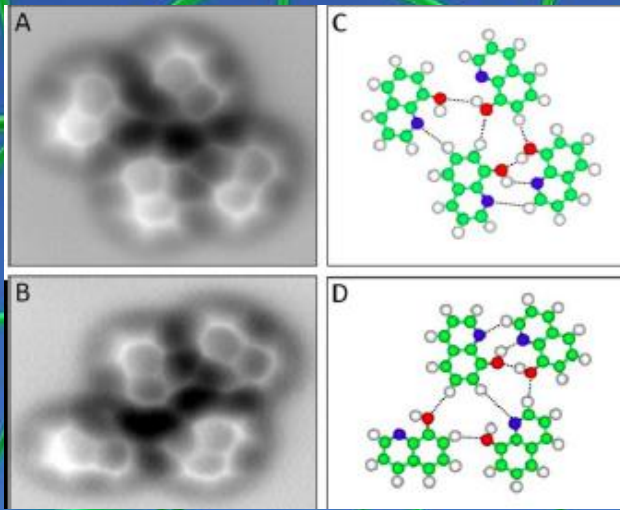
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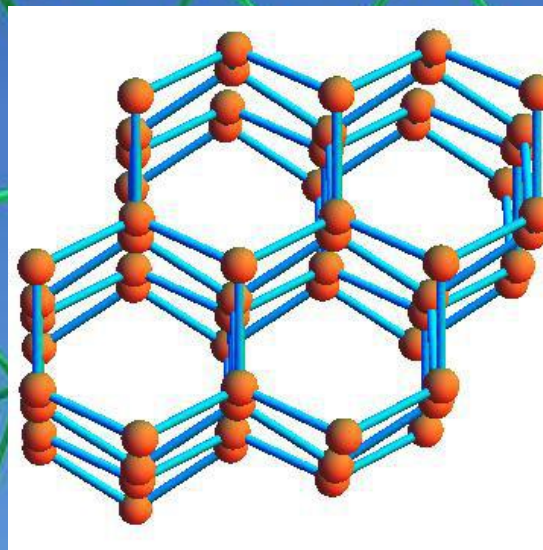


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....or you can show how the water's molecular structure look a like when it is freezing:



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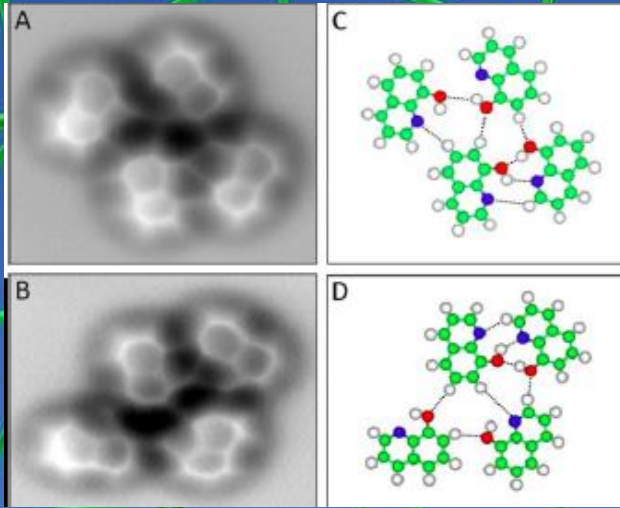
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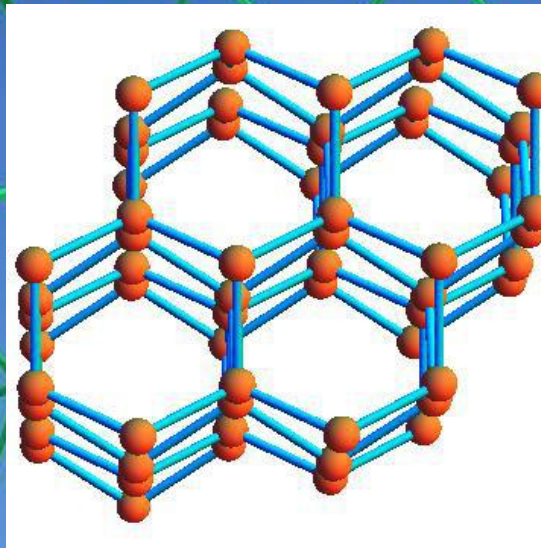


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....or you can show how the water's molecular structure look a like when it is freezing:

the water molecules in an ice crystal form themselves into a six-sided lattice...



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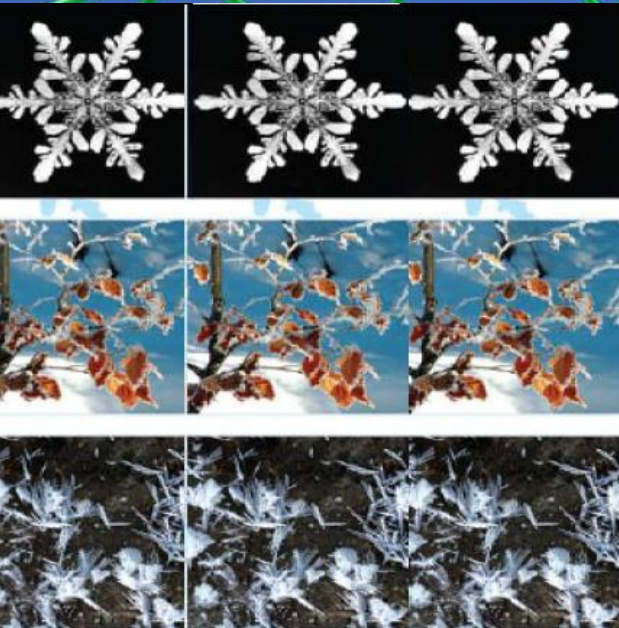
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Snow is “solid” rain. It forms when **fine drops of very cold water attach themselves to dust particles or to bacteria and then freeze.**

This situation occurs **within clouds**, at or **below -12° Celcius.**



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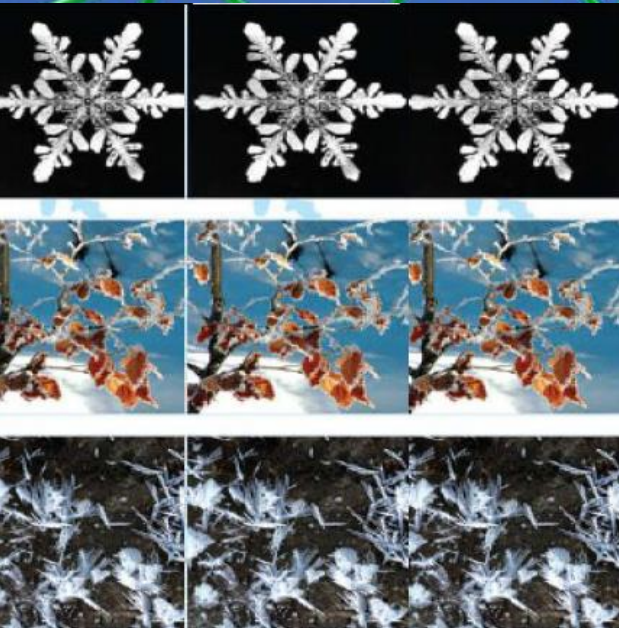
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The surrounding **temperature and humidity** influence how each **crystal** develops.

If it is **very cold**, with a **high level of humidity**, **six-sided hollow columns** will form.

If the weather is **warmer**, **six-sided stars** will appear.

Each and every crystal follows its own particular path on its way downwards and the tiniest fluctuations in temperature and humidity **will have an effect on its appearance.**



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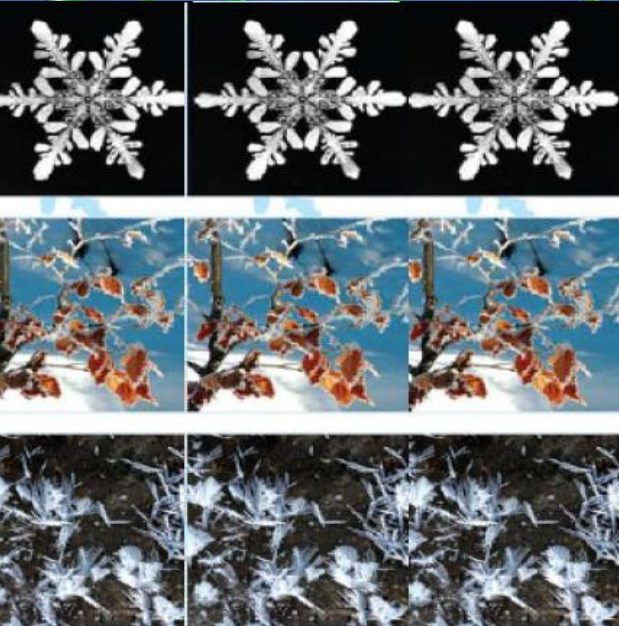
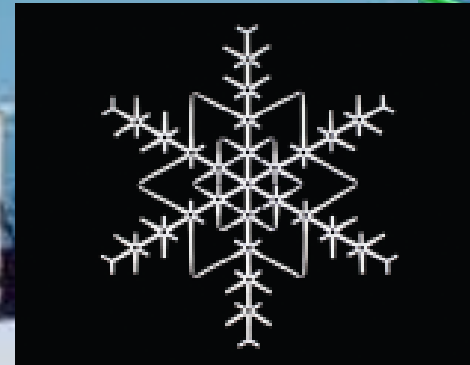
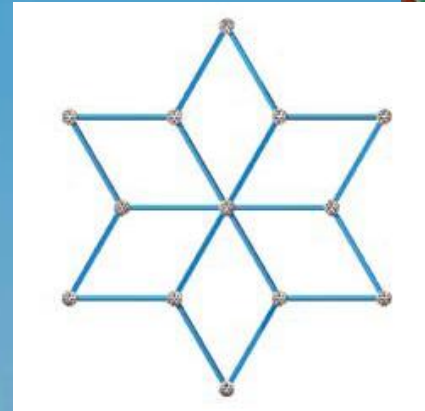
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Maybe your ice crystal will develop into a beautiful 3 dimensional star while falling down?



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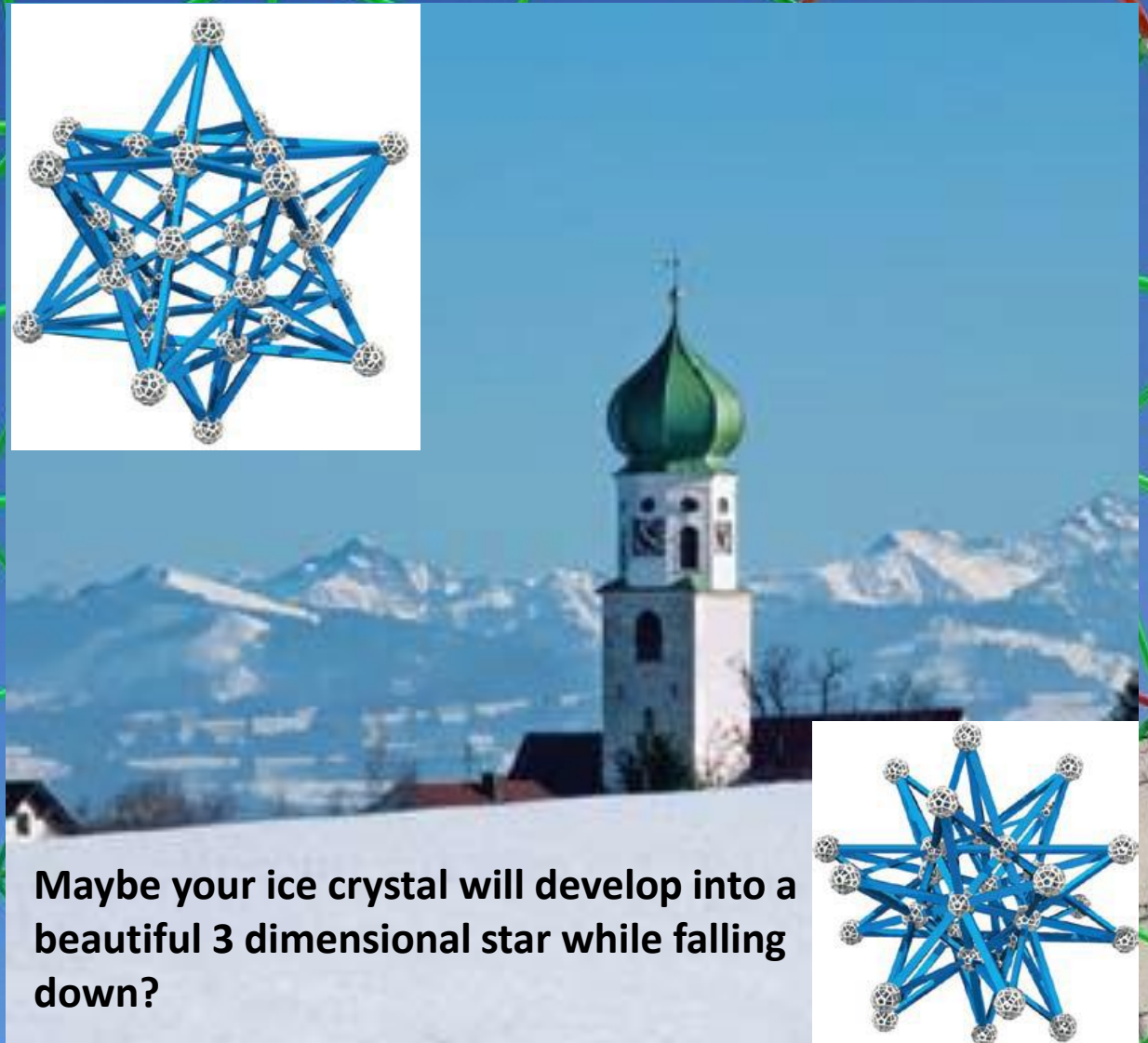
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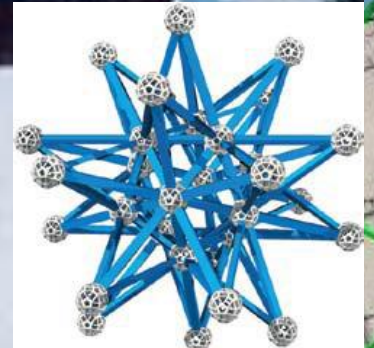


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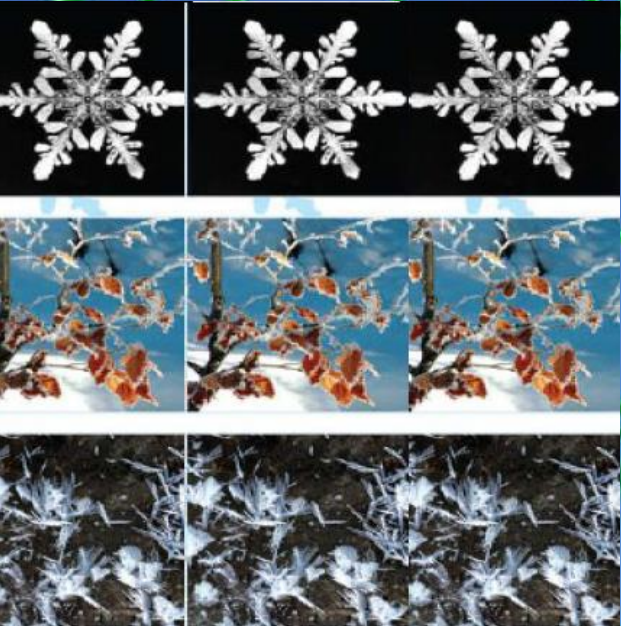
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Snowflake Bentley

The Official Web Site of Wilson A. Bentley(1865-1931)
"No Two Snowflakes Are Alike"

<http://www.snowflakebentley.com/>



The American Chemical Society Presents

THE CHEMISTRY OF SNOWFLAKES

<http://science360.gov/obj/video/39857f05-a4c6-4227-b0e8-719e2b437a72/chemistry-snowflakes>

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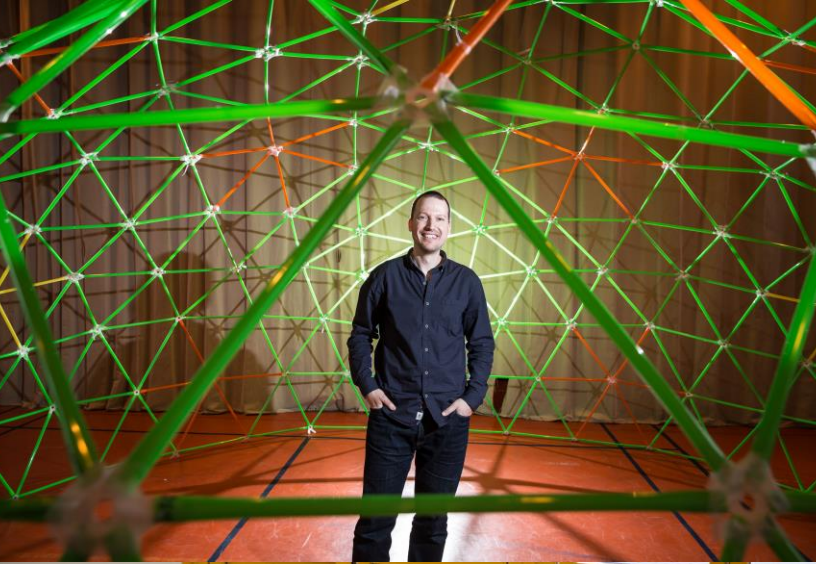
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Work in pairs or in small groups! Work as a team of engineers!

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

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



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

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Website: www.experienceworkshop.org

Facebook: www.facebook.com/experienceworkshop.math.art