The nucleation game with live music

Instructions for demonstrators

About this activity

‘The nucleation game’ combines the hands-on activity of assembling a crystal structure with the thematic enhancement of jazz music, specifically composed to reflect the process of crystallization in metal-organic frameworks (MOFs). Music will follow while constructing and there are plenty of talking points about the processes of crystal growth.

Key information

Science topic(s): Crystals, Crystallisation, Framework materials.

Age range: 5+, including adults.

Activity duration: 5 minutes – 30 minutes

Health and safety considerations: Zoob pieces can pinch fingers.

A blue plastic pipe structure

Description automatically generatedSpecial requirements: Musicians

What’s in the box?

1. These instructions for demonstrators.
2. Risk assessment.
3. Materials for the activity:
   1. Zoob pieces (Blue only for 36 pieces)
   2. Stopwatch
4. Map for describing the process (Laminated A4 sheet)
5. Information to display about the activity (Laminated A4 sheet).
6. Postcards about the activity to give out (A6 card).
7. Stickers for giving out to/counting participants.

How to set up this activity

1. Count for at least 36 pieces of blue Zoobs, and make sure each Zoob is separate
2. Test the audio equipment to ensure the music plays clearly and at an appropriate volume. (Responsibility of musicians)
3. Display the laminated information and postcards somewhere nearby (e.g., on a table) and have the stickers on hand to give out when participants have completed the activity.

How to demonstrate this activity

1. Briefly explain the purpose of the game and introduce the musical piece "Nucleation" and explain how it mirrors the nucleation process.
2. Clearly explain how to assemble the pieces, emphasizing the goal of replicating the structures shown in the provided figures.
3. Discuss the variations and their implications for strategy and difficulty. (Optional- you could do this after playing)
4. Start the music and timer simultaneously to signal the beginning of the game.

!! Encourage participants to feel the music and let its rhythm guide their assembly process.

1. Offer tips and help manage any difficulties with piece connections, especially for beginners or younger participants.
2. Facilitate a discussion about their experiences, focusing on how the music influenced their assembly strategies. Encourage participants to describe their structures and any insights they gained regarding the relationship between music and crystallization.
3. Explain the whole process through the map and let them get a deep understanding of the process of nucleation.

Taking this activity further

You can use the activity to discuss any of these subjects:

* Defects
* Amorphous material
* Epitaxial growth
* Structures of plastic

How to pack this activity away

* Disassemble all of the crystal constructions, try to sort the Zoob pieces as you go (this helps with the activity next time).
* Discard any broken pieces.

This activity goes well with…

* The Nucleation Game
* Mineral crystals
* Crystallisation of a magic crystal tree

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