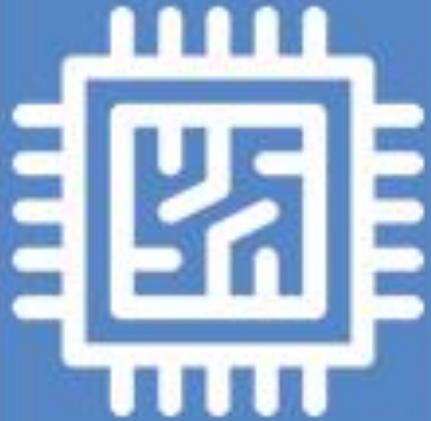




S

SCIENCE



T

TECHNOLOGY



E

ENGINEERING



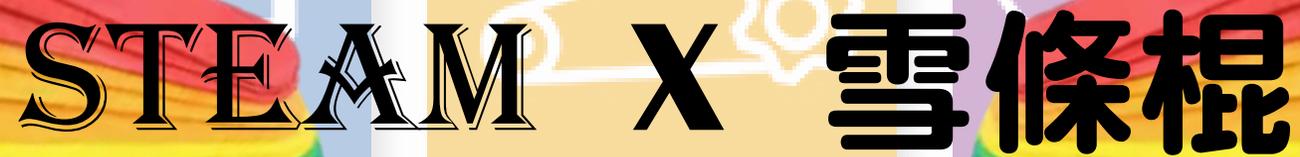
A

ART



M

MATHEMATICS

The text "STEAM X 雪條棍" is centered in the upper half of the image. "STEAM" is in a black, outlined, serif font, "X" is in a bold, black, sans-serif font, and "雪條棍" is in a bold, black, sans-serif font. The background features a large, colorful paper airplane made of sticks, with wings in shades of red, orange, yellow, green, blue, and purple. The background is divided into vertical color bands: green, blue, yellow, purple, and pink. Faint white icons representing science, technology, engineering, and arts are visible in the background.

STEAM X 雪條棍

The text "親子STEAM" is centered in the lower half of the image. "親子" is in a large, white, bold, sans-serif font, and "STEAM" is in a white, outlined, serif font. The background features a large, colorful paper airplane made of sticks, with wings in shades of red, orange, yellow, green, blue, and purple. The background is divided into vertical color bands: green, blue, yellow, purple, and pink. Faint white icons representing science, technology, engineering, and arts are visible in the background.

親子STEAM

SCIENCE

TECHNOLOGY

ENGINEERING

MATHEMATICS

親子STEAM

親子：

陪伴、鼓勵

同共經歷

享受過程

慢慢逐步放手

STEAM：

DIY(自己動手)

經歷失敗

建立信心

學習知識

S

SCIENCE

E

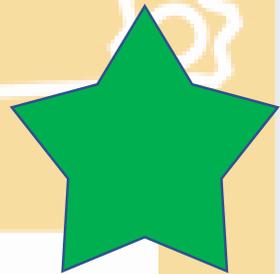
ENGINEERING

M

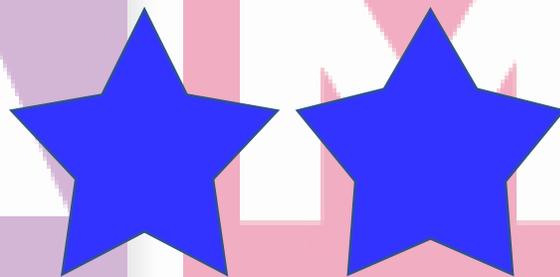
MATHEMATICS

親子STEAM X 雪條棍

簡易投石機



達文西橋



SCIENCE

TECHNOLOGY

ENGINEER



飛天骨牌

A. 雪條棍 X 簡易投石機

雪條棍 數支(50支)

橡皮筋4條

錫紙球4粒



小MAKER大創意



簡易冰棒棍投石機

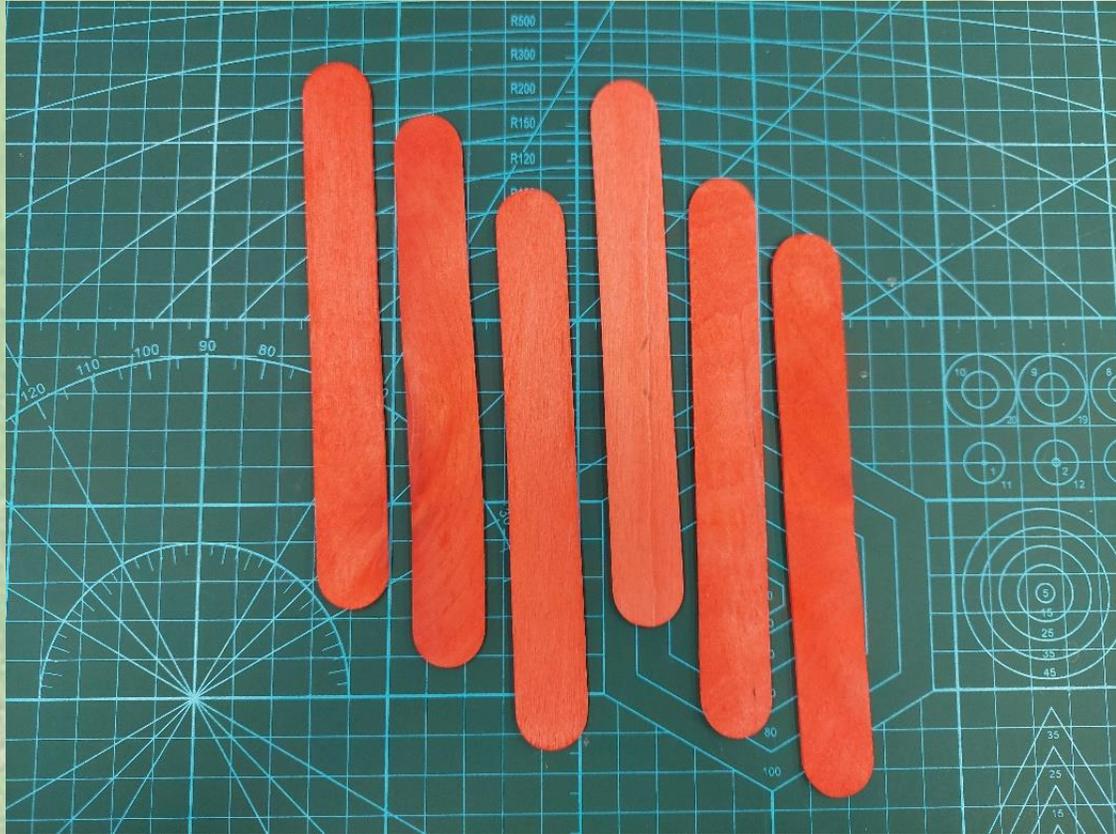
INTERPHOTO

https://www.youtube.com/watch?v=le_dKqAS51k



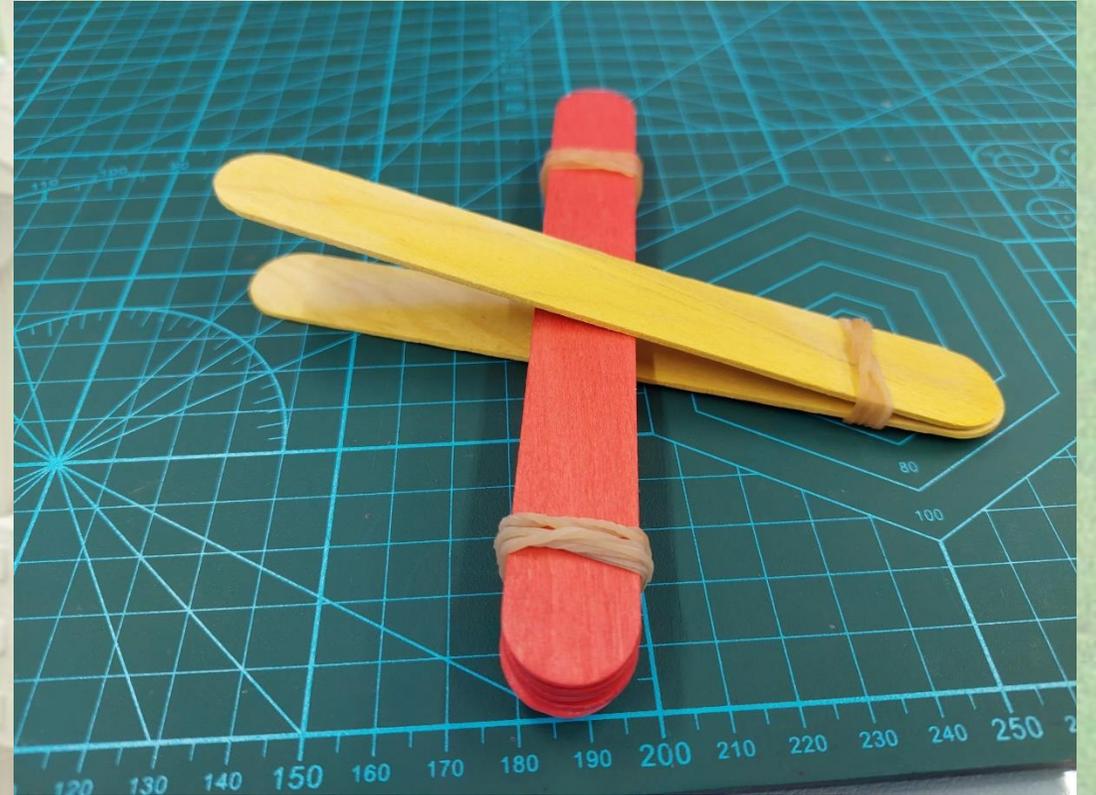
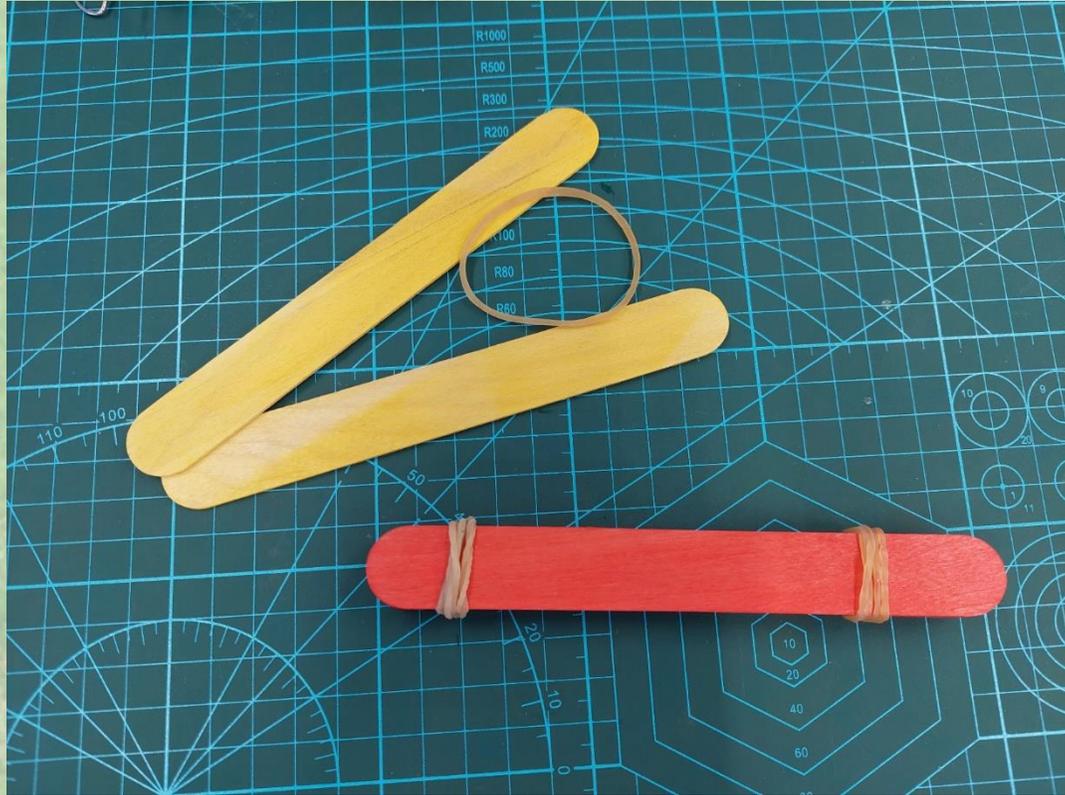
https://www.youtube.com/watch?v=le_dKqAS51k

雪條棍 X 簡易投石機



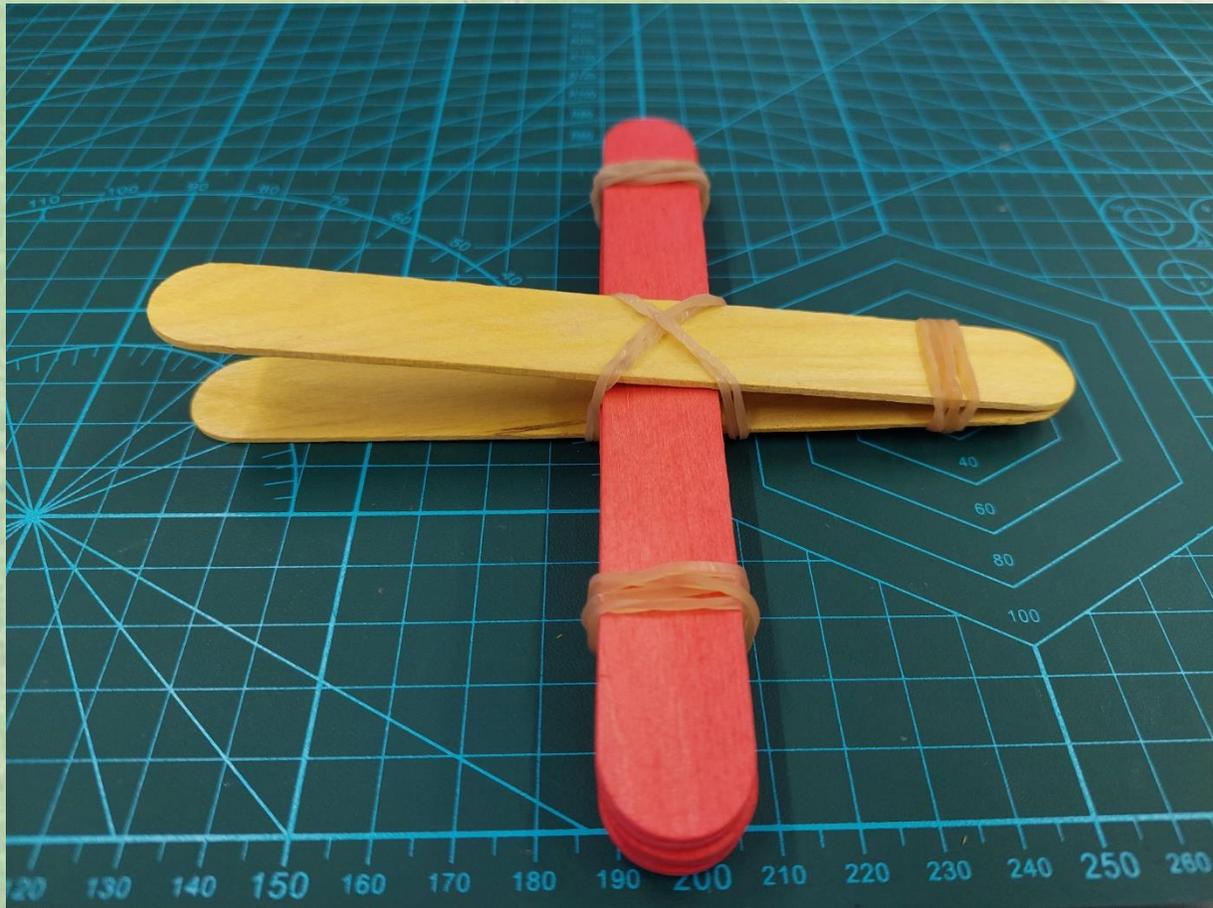
將6支雪條棍疊在一起，左右兩端用橡皮筋固定。

雪條棍 X 簡易投石機

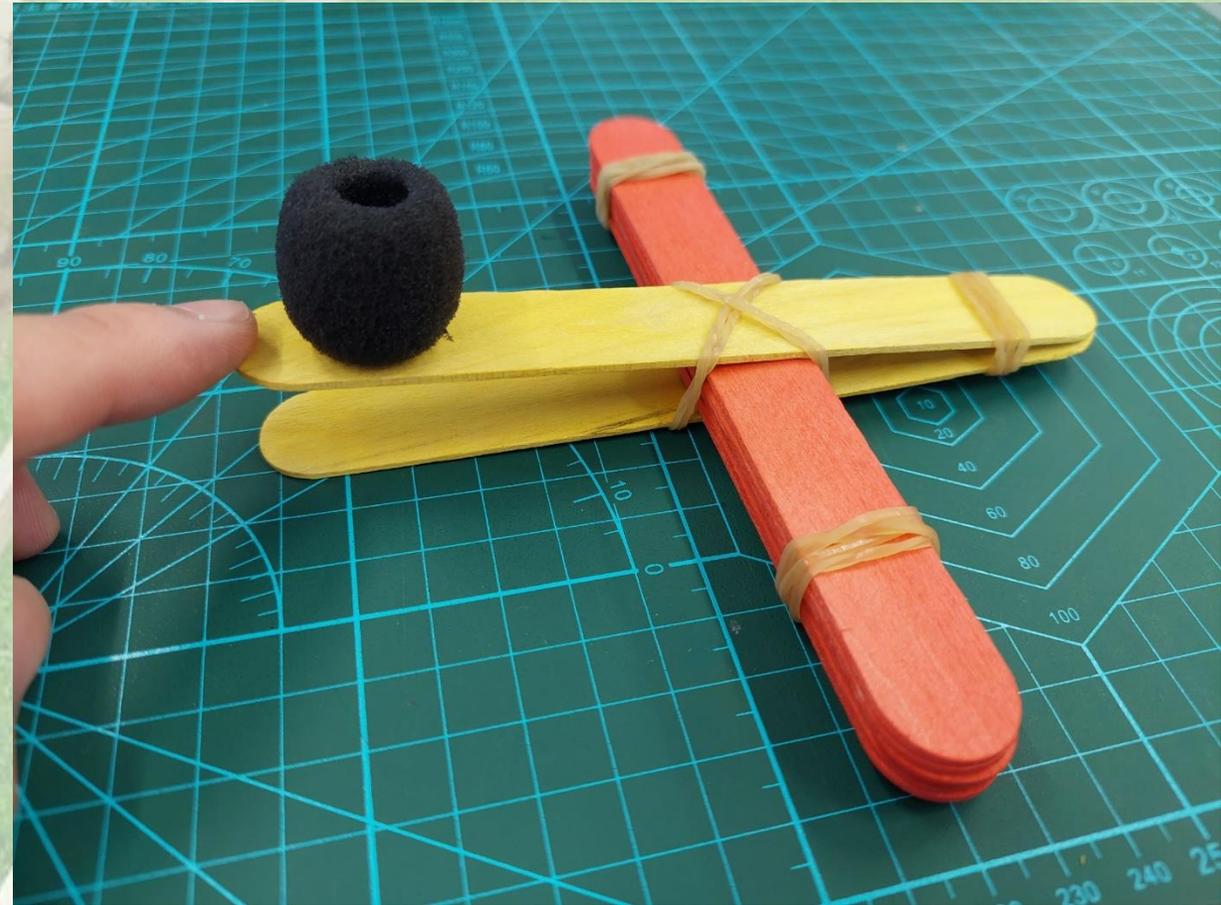


再拿2支雪條棍，放在綁好的6支雪條棍上下兩側，尾端用橡皮筋綁起來，成為一個十字型的裝置。

雪條棍 X 簡易投石機



用最後一條橡皮筋，固定雪條棍的中央，左右交錯打一個十字型的結。



運用重力與槓桿原理的簡易投石機就完成了

雪條棍 X 簡易投石機 原理

- 能量守恆：雪條棍彎曲產生彈力，彈力的位能轉化為動能
- 槓桿原理



完成後，可以改變疊起雪條棍的數量，或支點的前後位置，試試錫紙球會不會更遠？

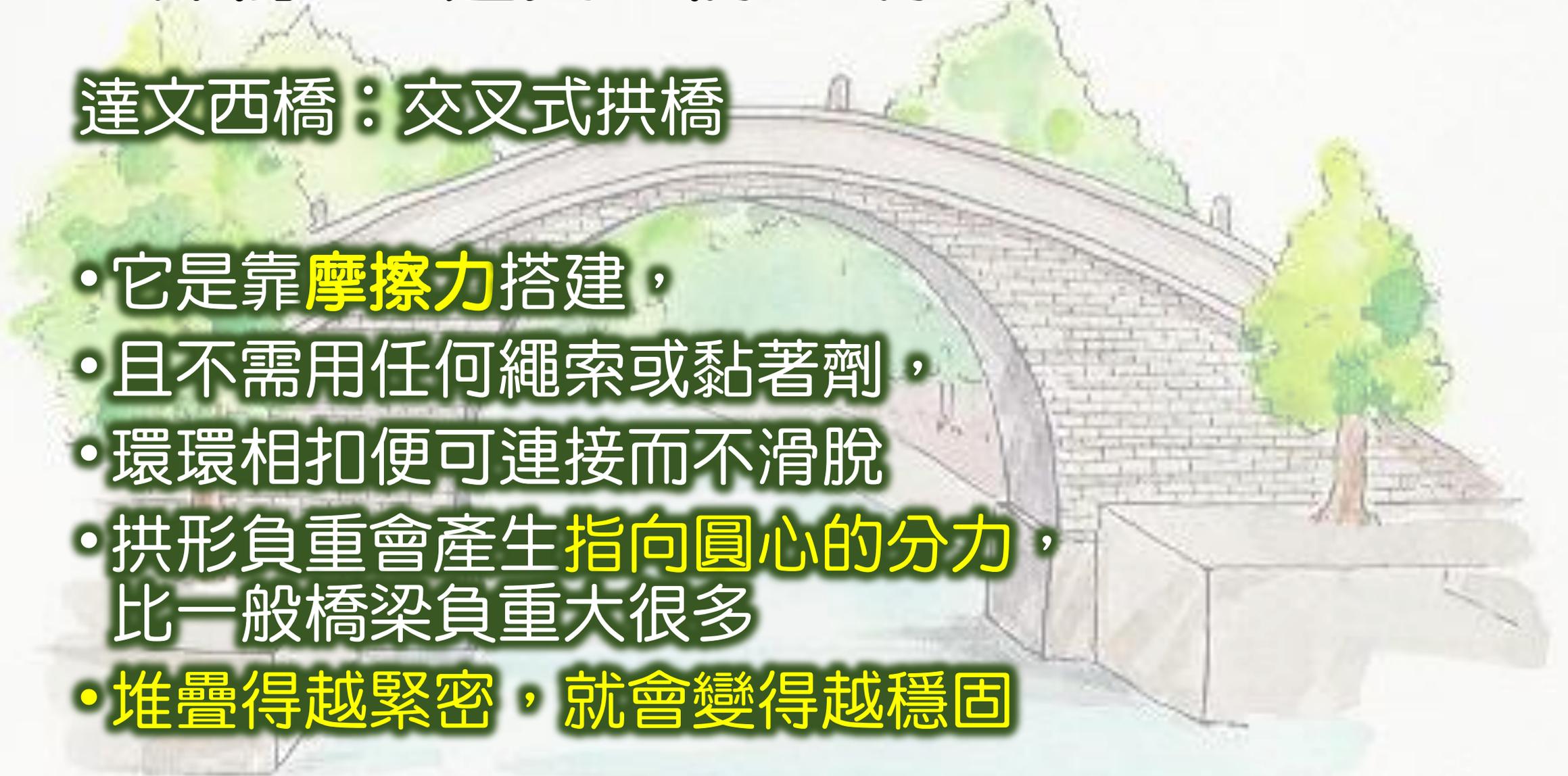
B. 雪條棍 X 達文西橋



雪條棍 X 達文西橋 原理

達文西橋：交叉式拱橋

- 它是靠**摩擦力**搭建，
- 且不用任何繩索或黏著劑，
- 環環相扣便可連接而不滑脫
- 拱形負重會產生**指向圓心的分力**，
比一般橋梁負重大很多
- **堆疊得越緊密**，就會變得越穩固





- <https://youtu.be/BGHEuv4TvmI?si=VpCjyx2XjLfBIHxg>



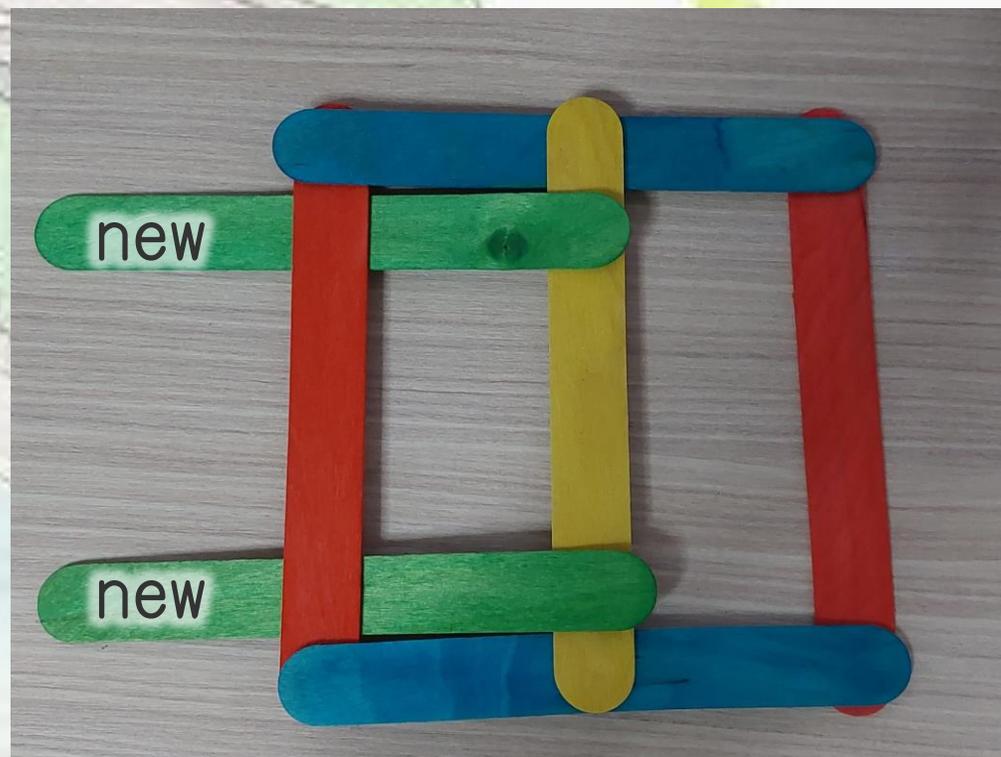
<https://youtu.be/BGHEuv4TvmI?si=VpCjyx2XjLfBIHxg>

雪條棍 X 達文西橋

先以五根木條為組合搭出如圖A的模樣，接著如圖B將一支木條以交叉結構的方式穿入(交叉結構)，左右各二支如圖C。



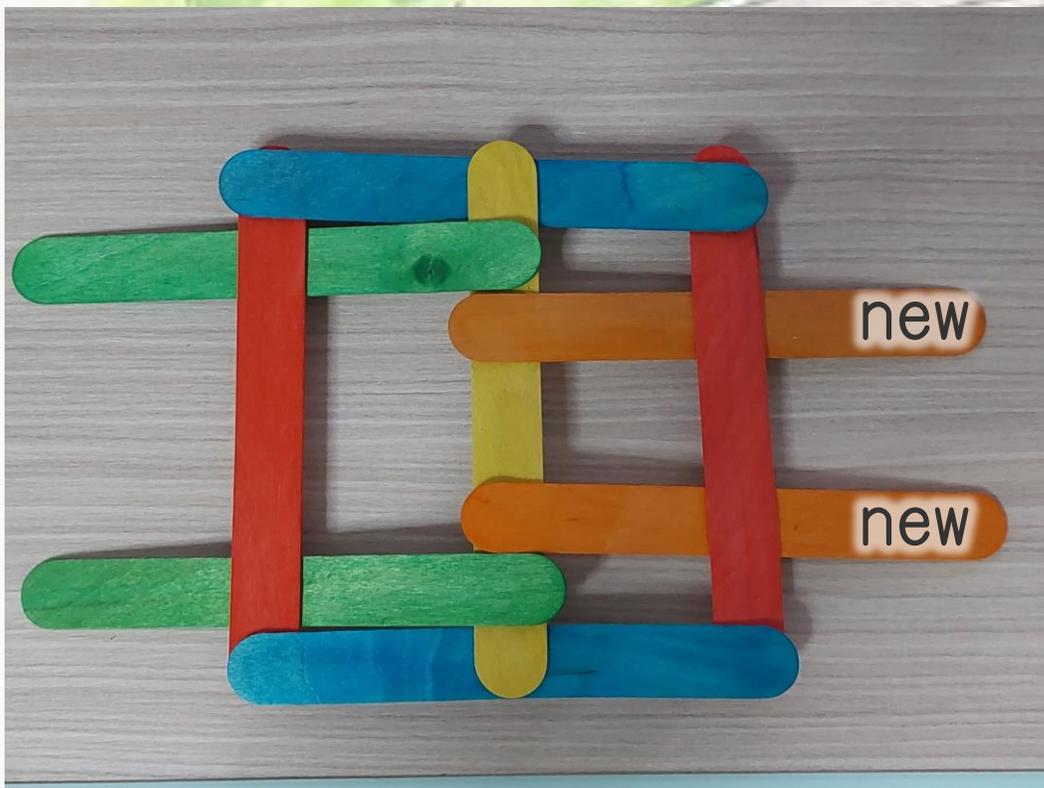
圖A



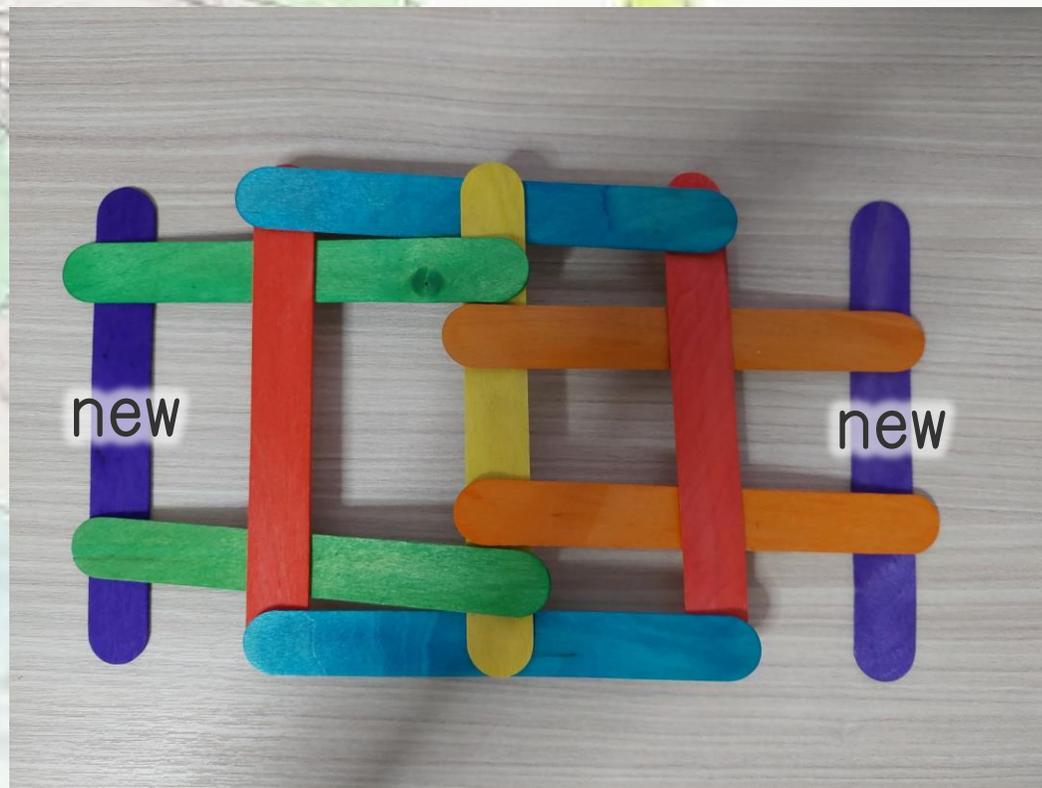
圖B

雪條棍 X 達文西橋

- 使用交叉結構，左右各二支如圖C，完成了橋中央的部份，將著是要往二邊延伸。如下圖，下方搭上另一支木條(圖D中紫色木條)



圖C



圖D

雪條棍 X 達文西橋

- 之後再穿入另外二支固定(圖E中橙色木條)。
- 以五根木條為基本構型的方式最容易，之後是橋面的延伸，便可依喜好不斷延長。

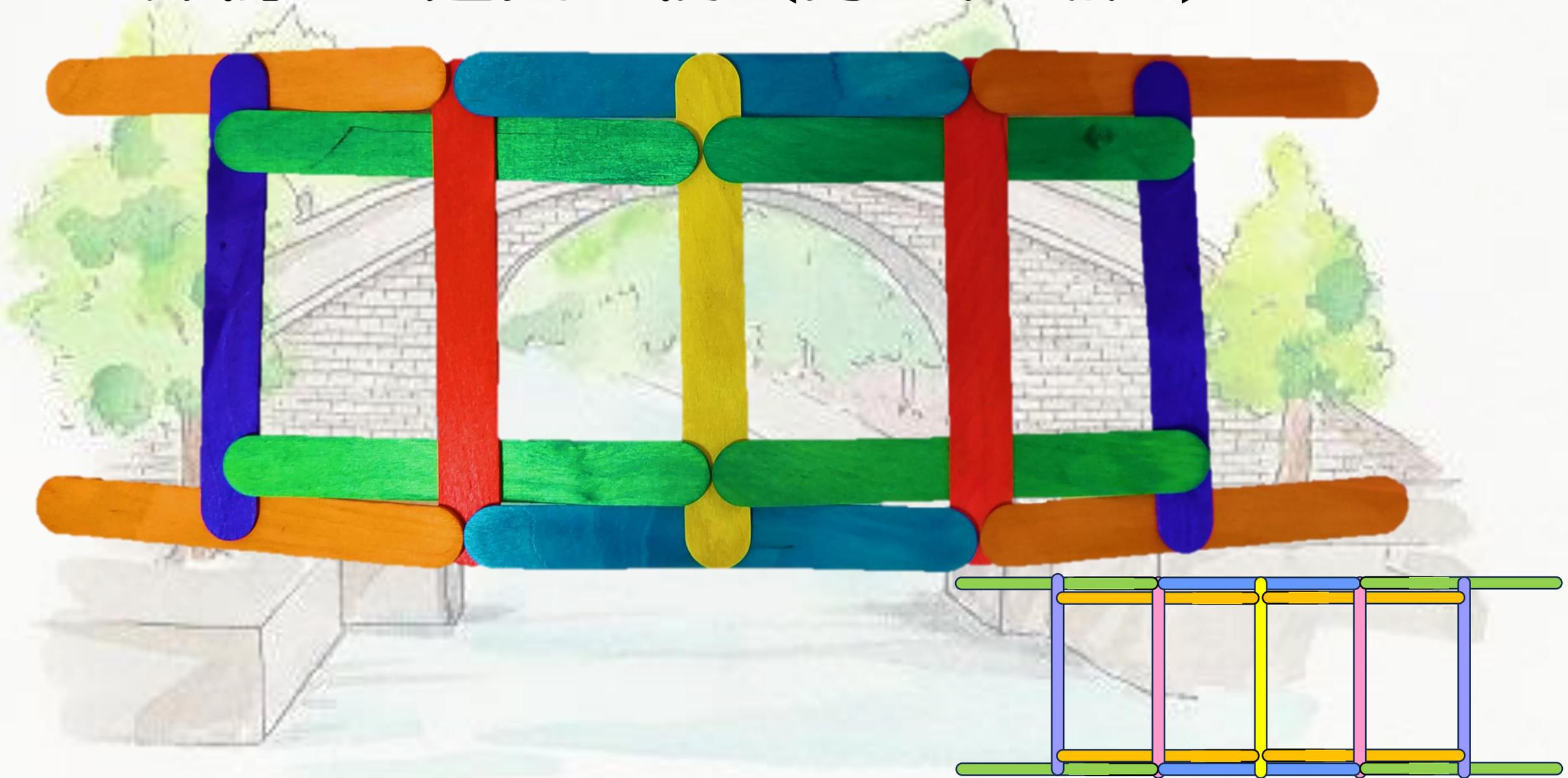


圖E



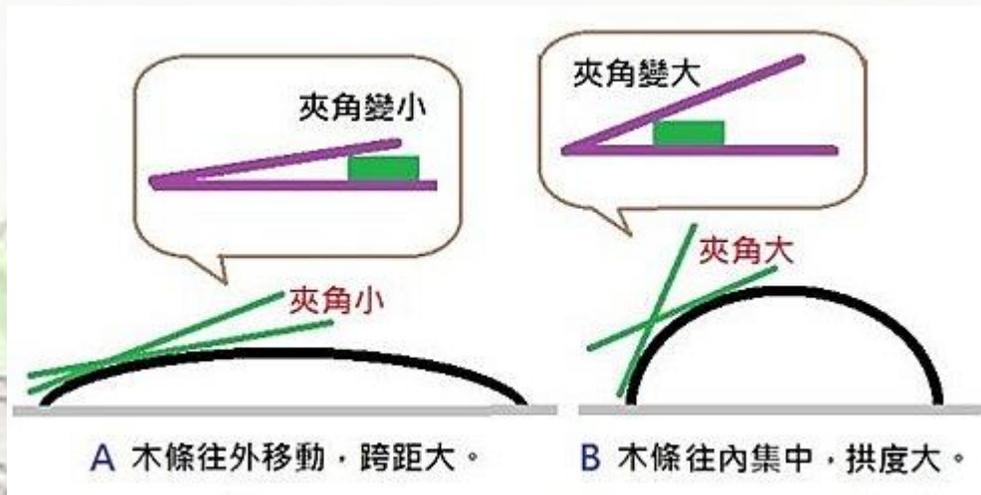
圖F

雪條棍 X 達文西橋 (另一種砌法)

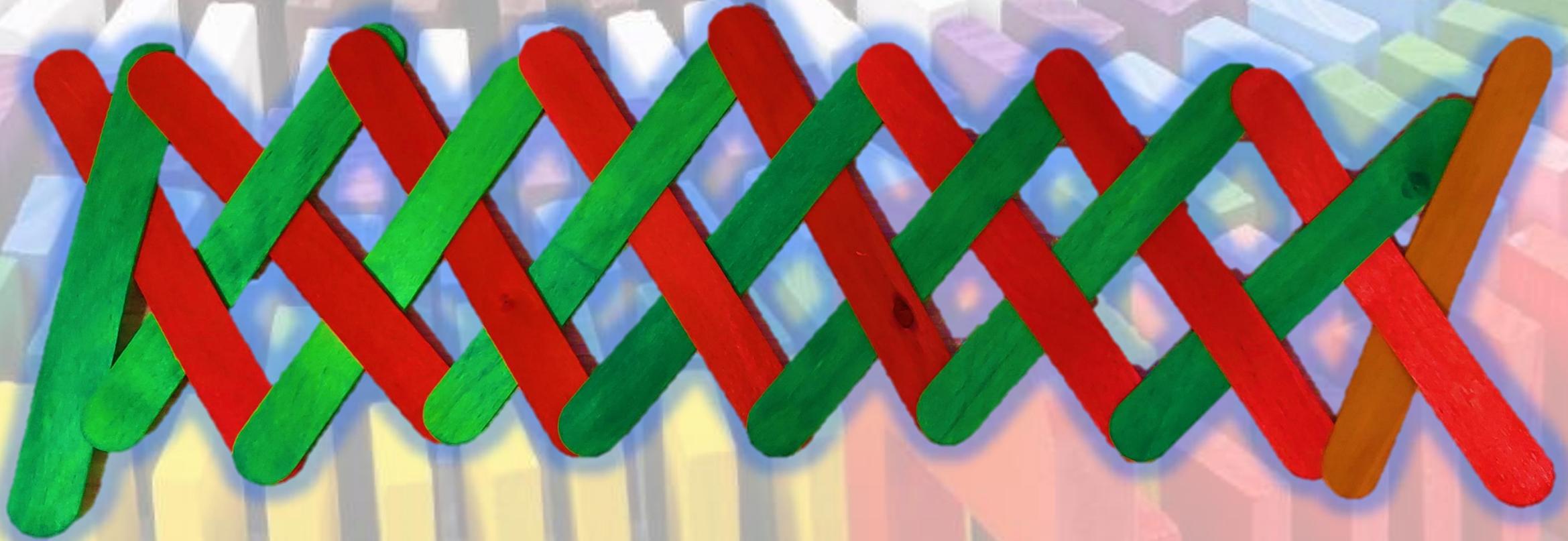


雪條棍 X 達文西橋

- 基本完成



C. 雪條棍 X 連鎖反應 (飛天骨牌)





最後一隻同樣做交叉固定

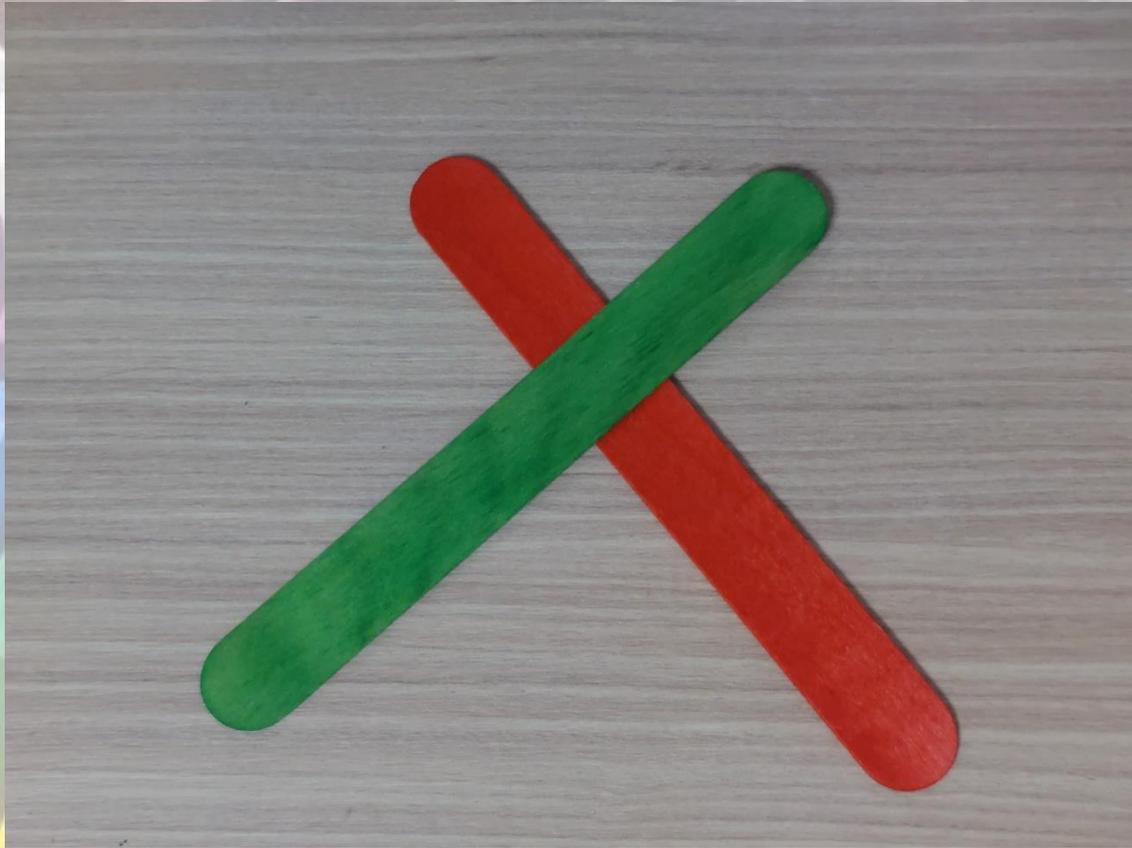
<https://www.youtube.com/watch?v=L8VLHN9Aj5Q>



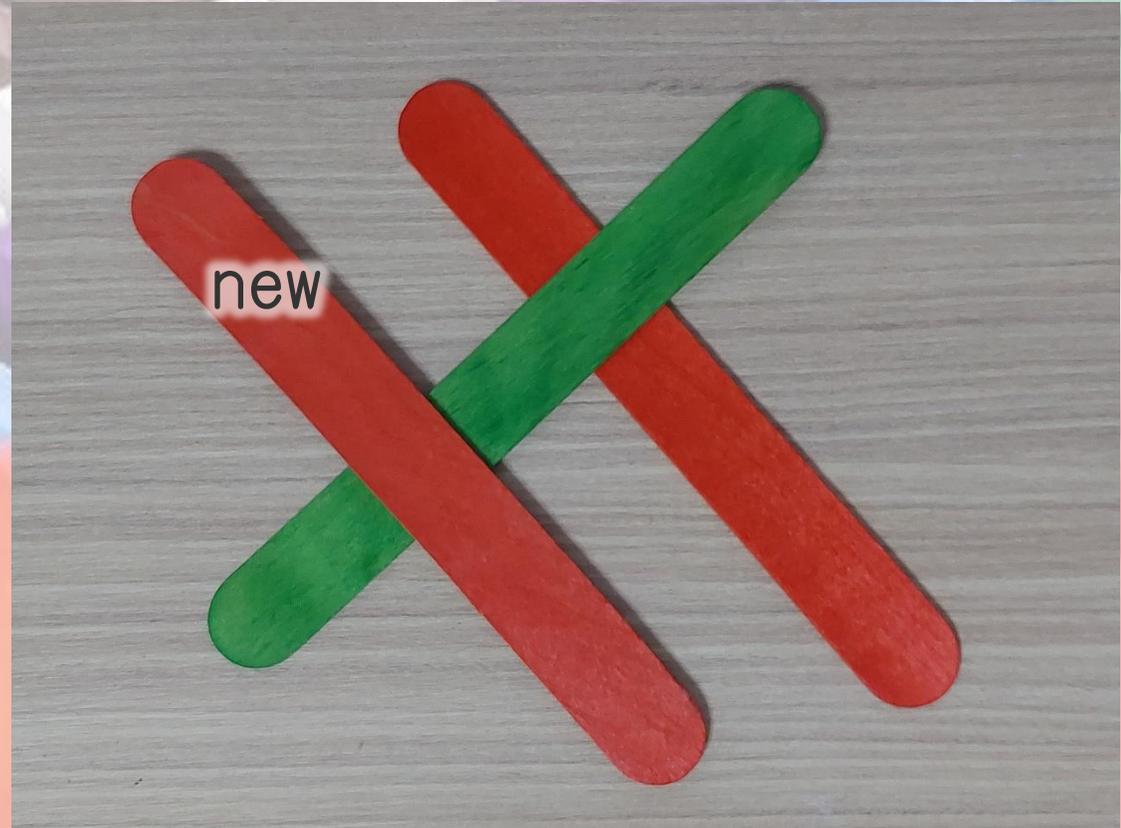
交叉結構
上下上下

<https://www.youtube.com/watch?v=L8VLHN9Aj5Q>

雪條棍 X 連鎖反應 (飛天骨牌)



先用紅色放在下面，綠色放上面型成交叉結構X字



然後在綠色上圖位置放上紅色

雪條棍 X 連鎖反應 (飛天骨牌)



再用第二支綠色扣在三支棍之間，型成下上下下扣實

固定後，把第三支綠色放在紅色兩支間上下穿插如圖

雪條棍 X 連鎖反應 (飛天骨牌)

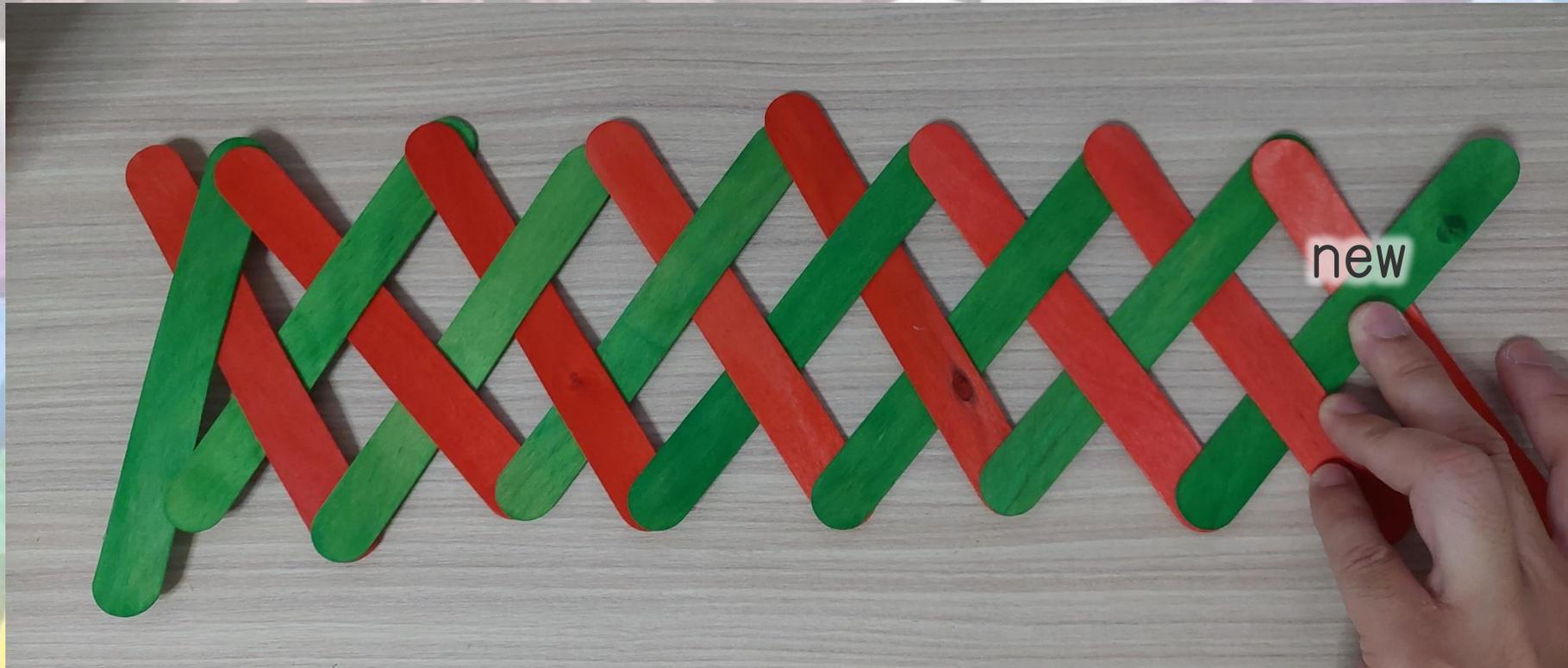


用第三支紅色之間，放在綠色兩支間上下穿插如圖扣實



用第四支綠色之間，放在兩支間上下穿插如圖扣實紅色

雪條棍 X 連鎖反應 (飛天骨牌)



持續機械式上下穿插，
就能無限延長

雪條棍 X 連鎖反應 (飛天骨牌)



可以完全放手了

當完結時，用橙色扣在三支棍之間，型成下上下上或上下上扣實，就能完成了

雪條棍 X 連鎖反應 原理

- 能量守恆：雪條棍彎曲產生彈力，交叉結構緊密互連能量，當其中一個釋放能量，就會產生連鎖反應，雪條棍儲存了的位能就轉化為動能



當放開其中一邊的雪條棍，連鎖彈跳就會發生

A character with long brown hair and a blue blindfold is shown from the chest up. They are wearing a blue suit jacket over a white shirt and a red tie. Their mouth is wide open in a shout. A hand is placed on their right shoulder. The background is a warm, golden-brown color with two bright rectangular light sources at the top. A small 'SUNRISE' logo is visible in the lower right corner of the image.

STEAM

IS FREEDOM!!!