高雄市 112 年度第 42 屆國民中小學科學園遊會 高雄市大寮區忠義國小
Kaohsiung Primary and Junior High Schools Science Lawn Party
Kaohsiung Daliao District Zhongyi Elementary School

平衡鳥與延伸活動—創作多種平衡造型

Balancing Bird and Extended Activities— Create a Variety of Balancing Modeling

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一、活動主旨 Activity Objectives

藉由剪紙造型與添加迴紋針重量的活動，讓參加者動手操作和探討「平衡」的成功與失敗的影響因素有哪些?透過國小自然科學的概念—槓桿原理，並與藝術創作相結合，設計出多元的造型，讓同儕互相欣賞、討論、實驗，達到寓教於樂的效果。

Through paper cutting modeling and adding the weight of paper clips, participants can operate and discuss the factors that influence the success and failure of "balance". Through the concept of natural sciences in the elementary school - the principle of lever, combining with art creations to design diverse modeling, allowing peers to appreciate, discuss, and experiment with each other, achieving an educational and entertaining effect.

二、製作方式 Activity Procedure

首先，參加者思考和預測什麼造型的平衡鳥可以成功以一根手指的指尖部位達成平衡，且不掉落?

接著，實際動手做出平衡鳥，嘗試是否能以一根手指的指尖部位達成平衡? 依據平衡失敗或成功的經驗，探索會是什麼原因造成的。

透過討論與觀察更多種平衡鳥造型(有成功、失敗的版本)，再次設計能達成平衡的創新造型。

First, the participants think and predict what kind of balancing bird could be successfully balanced on one fingertip without falling off?

Then, make a balancing bird. Can the balancing bird be balanced on one fingertip through experimentation? Based on the successful or failed experiences of balance, exploring the factors.

Through discuss and observe more kinds of balancing bird modeling (including successful and failed versions), and design an innovative modeling that can achieve balance.

（一）將一張紙對摺。

（二）發想與描繪平衡鳥的圖形輪廓。

（三）沿著平衡鳥的圖形輪廓剪下。

（四）將一些迴紋針夾在平衡鳥上。

（五）將平衡鳥放於一指尖上，達成平衡，不會掉落。

(1) Fold a piece of paper in half.
(2) Think and draw the outline of the balancing bird pattern.
(3) Cut the balancing bird out along the outline.
(4) Clip some paperclips onto the balancing bird.
(5) Put the balancing bird on your fingertip to achieve balance without falling off.

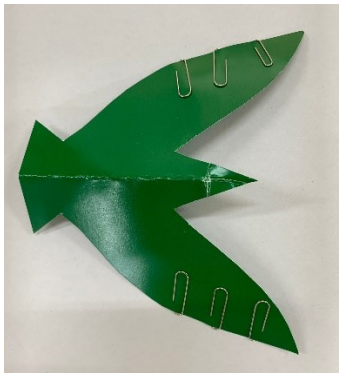
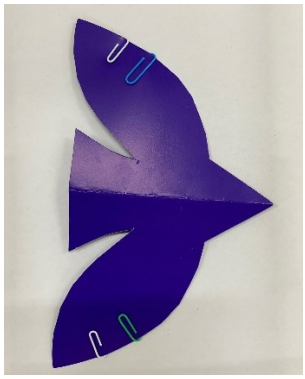
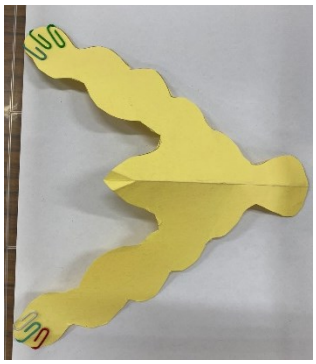
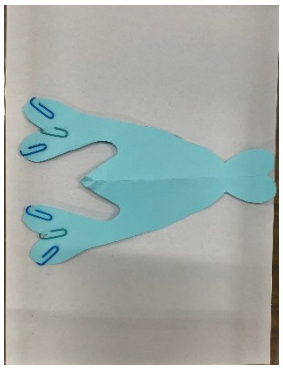
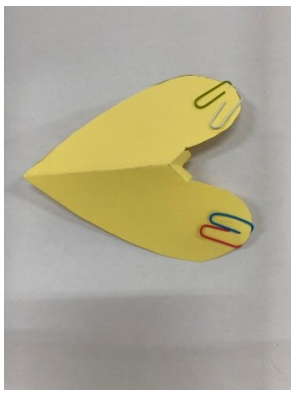
三、討論與結論 Discussion and Conclusion

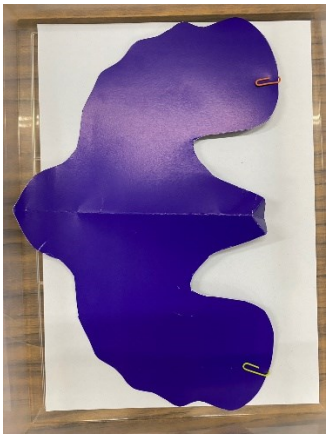
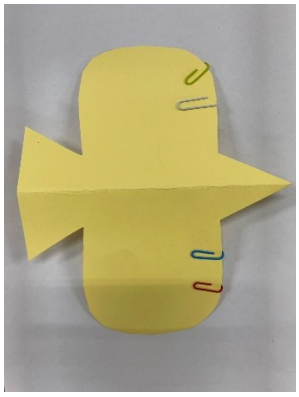
完成以上活動可以發現，使平衡鳥達成平衡的關鍵為：剪下的平衡鳥圖形是對稱的、平衡鳥兩邊的翅膀所夾的迴紋針重量與位置是相同的，此為槓桿原理的應用。而且，不只鳥類造型，鳥類以外的多元造型都可能成功達成平衡。無限的創造力可以設計出多樣的平衡造型，是一個有趣且具有藝術性的科學活動！

After completing the above activities, you can find that the key to making the balancing bird achieve balance is: the cut-out figure of the balancing bird is symmetrical, and the weight and position of the paperclips clipped on both sides of the wings are the same. This is the application of the principle of lever.

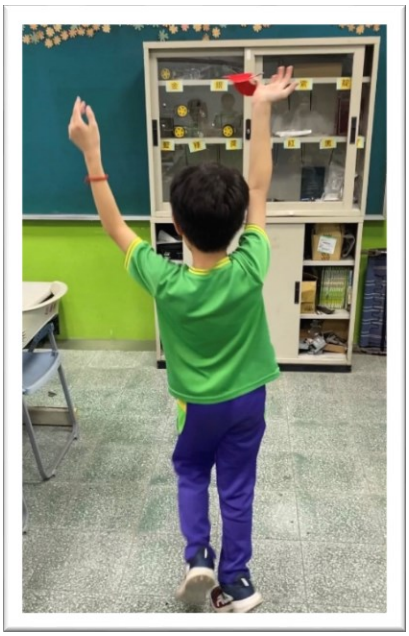
Moreover, not only bird modeling, but also diverse modeling except birds might successfully achieve a balance. Infinite creativity makes you design a variety of balancing modeling, which is an interesting and artistic science activity!

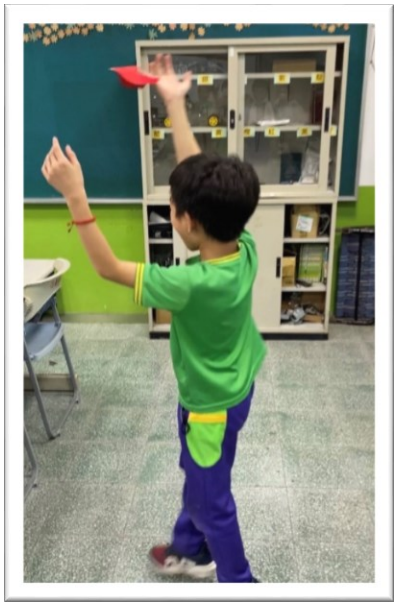
★作品集★

		
翅膀在前	翅膀在後 *手指需放在靠尾部才能平衡	圓弧翅膀在前、尖尾
		
波浪形翅膀在前	愛心型翅膀在前 愛心尾部	長方形翅膀在前
		
往後捲曲形翅膀	其他形狀	全愛心形翅膀

		
翅膀往前內收 短身、長尾	翅膀向前 短身、寬短尾	寬大翅膀在前、寬尾
		
模擬真實鳥形	大蝴蝶形翅膀	蜻蜓形翅膀
		
空心圓形翅膀	花朵形翅膀	大正方形形翅膀

➔ 創意發想～三隻平衡鳥疊起來！





➔ 創意發想～將平衡鳥放在指尖，跳舞、旋轉！