The G5 KCFS Gazette

Kang Chiao International School, Hsinchu Campus, International Department

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Constructing a Catapult
建造彈射器

Understanding the Science

Building on the knowledge the students learned during the last project, we continued the learning on potential and kinetic energy with how it relates to the current project of building a catapult. The students were also introduced to Newton's Second Law of Motion, force = mass x acceleration. To demonstrate this principle, the students tested launching an object at different angles, which would represent the force, to find the ideal angle or force of launch. After plotting all of the points on a graph, they were able to see the bell curve that represented the ideal angle for their catapult.

Designing and Creating the Catapults

For this project, fifth grade students designed and built a catapult prototype that can launch an item the furthest distance while being accurate. During their plan and create stages, the students needed to incorporate their knowledge of forces, energy, and angles to come up with the best design.

Testing the Catapults

During the testing stage, students were given a choice of different objects to launch from their catapults. The parameters of the test was to see which team could launch an object the farthest distance while still being accurate with their shot. The winning team was able to launch their object 20 meters. The students made some great improvements to their designs after the initial testing.

理解科學

基於上個專題中學生所學到的知識，我們繼續學習勢能和動能，並將其與本次主題建造彈射器做連結。學生更接觸到牛頓第二運動定律，也就是力等於質量乘以加速度。為了演示這個原理，學生用力的不同角度來測試並發射物體，以找到理想的發射角度或發射力。在將所有數據繪製在圖表上後，他們能夠看到呈現鐘形曲線的圖形，也代表他們彈射器的理想角度。

設計和製造彈射器

在這個專題中，五年級的學生要設計和製造一個能夠以最遠的距離，並且準確地發射物體的彈射器原型。在他們的計劃和創造階段，學生需要運用他們對力、能量和角度的知識，以提出最佳的設計方案。

測試彈射器

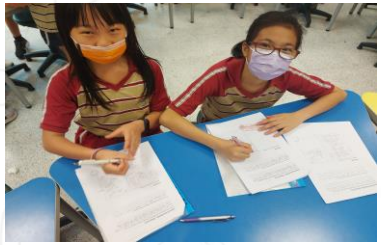
在測試階段，學生可以選擇不同的物體從彈射器發射。測試的參數是看哪個小組能夠以最遠的距離發射物體，並且發射時仍然準確。獲勝的團隊成功地將他們的物體發射了二十米遠的距離。學生在初步測試後也對他們的設計進行了一些很好的改進。

1 ASK + IMAGINE 提問 + 創思 2

Students did research on different catapult designs and angles of launch.
學生研究不同的彈射器設計和發射角度。

3 PLAN 計畫

Students used their knowledge to plan out a precise design of their catapult.
學生利用他們的知識對彈射器進行精確的設計。

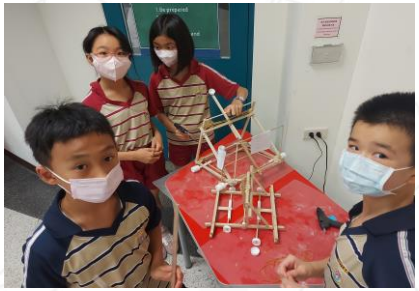


6 PRESENT 展現

Each team presented their results and informed their classmates of their challenges.
每個小組展示他們的結果，並向同學分享他們面臨的挑戰。

4 CREATE 創造

Teams worked together to execute their plans and build the unique designs.
小組共同努力執行計劃並建造獨特的設計。



5 IMPROVE 改進

After the initial testing, students revised their approach to tackle the problem.
初步測試後，學生修改解決問題的方法。