

October 2025

Launchers

發射器

Launcher Technology

Catapults have been used for thousands of years, dating back to the ancient Greeks and Romans. These powerful machines were designed to launch objects across long distances and break through castle walls. Catapults are fascinating because they show how forces and energy work together. When a catapult is pulled back, potential energy is stored; when released, that energy turns into kinetic energy, launching the object forward.

Exploring Motion

In this project, students explored how energy and force create motion through several hands-on activities. They experimented with ramps, toy cars, and push-and-pull challenges to see how gravity, height, and force affect speed, distance, and movement. Through these experiments, students gained a deeper understanding of how energy changes from potential to kinetic and how forces make objects move in different ways.

Building on their discoveries, students entered the *Create Stage*, where they designed and built two different launchers powered by push and pull forces. They tested and compared their designs to see which could launch objects the farthest or with the most accuracy. By experimenting, observing, and improving their models, students connected science, engineering, and creativity in a fun and meaningful way.

發射器技術

投石機的使用已有數千年歷史，最早可追溯到古希臘和古羅馬時期。這些強大的機械被設計用來將物體發射到遠處，甚至摧毀城堡的城牆。投石機之所以迷人，是因為它展現出力與能量如何相互作用。當投石機被向後拉時，會儲存彈性勢能；而當它被釋放時，這些能量就會轉化為動能，將物體向前發射出去。

探索「運動」

在這專題，學生透過多項實作活動，探索能量與力如何產生運動。他們利用斜坡、玩具車，以及推與拉的挑戰實驗，觀察重力、高度與施力如何影響速度、距離與移動方式。透過這些實驗，學生深入理解能量如何從勢能轉換為動能，以及力如何以不同方式推動物體運動。

在建立基礎理解後，學生進入創造階段，設計並製作兩種以推力和拉力為動力的發射器。他們測試並比較這些設計，看哪一個能將物體發射得更遠或更準確。透過不斷實驗、觀察與改進模型，學生在有趣又富有意義的過程中，將科學、工程與創造力緊密結合。

1

ASK + IMAGINE
提問 + 創思

2

We investigated the relationship between forces and energy and how one transforms into the other.
我們探究力與能量之間的關係，以及它們如何相互轉換。



3

PLAN
計畫

We applied what we had learned to design push-and-pull launchers.
我們運用所學來設計，以推力和拉力為動力的發射器。



4

CREATE
創造

We experimented with different designs and materials to build and improve our launchers.
我們嘗試不同的設計和材料來製作並改良我們的發射器。



5

IMPROVE
改進

We did several tests and shared our findings.
我們進行多次測試並分享結果。



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