

Lifting with Hydraulics 液壓起重

Why a “Hydraulic Lift”?

As engineers and scientists, it's important to understand how forces and pressure can be used to care for the environment. In this project, students explored the science behind hydraulic systems and how they can be applied to lift heavy objects. Inspired by the challenge of stranded whales, they designed and tested their own hydraulic lifts to see how simple machines can support efforts to protect marine life, connecting their work to the United Nations' Sustainable Development Goal 14: Life Below Water.

The Creative Process

Students investigated how hydraulic systems use fluids to transmit pressure and create movement. Working in teams, they designed and built functional lifts, then tested and refined their ideas. This hands-on approach gave them the chance to apply science in practical ways while also strengthening creativity, problem-solving, and teamwork skills.

為什麼要使用「液壓升降機」

身為工程師和科學家，理解力量與壓力如何被運用來保護環境是非常重要的。在這項專題中，學生探索液壓系統背後的科學原理，以及這些系統如何用來舉起重物。透過鯨魚擱淺挑戰的啟發，他們設計並測試自己的液壓升降機，觀察簡單機械如何協助保護海洋生物，並將他們的作品與聯合國永續發展目標第十四項「海洋生態」相連結。

創造過程

學生探究液壓系統如何利用液體傳遞壓力並產生運動。他們分組設計並建造可運作的升降機，接著測試並改進自己的設計。這種動手操作的方式讓學生有機會將科學應用於實際情境，同時也提升創造力、解決問題的能力與團隊合作技巧。

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1 ASK + IMAGINE 提問 + 創思

Students studied how biology and hydraulics allow for movement in different ways.

學生學習生物學與液壓原理如何以不同方式呈現運動。



4 CREATE 創造

Working in teams, students built their lifts and tested them on whale models of various weights.

學生分組製作液壓升降機，並在不同重量的鯨魚模型上進行測試。



5 IMPROVE 改進

After testing, groups adjusted their designs to increase strength and stability.

測試後，各小組調整設計以提升升降機的強度和穩定性。



3 PLAN 計畫

Groups created plans for mechanical lifts that use hydraulics.

各組制定利用液壓原理的機械升降機方案。



6 PRESENT 展現

Students presented their project process and explained how this technology could be applied to real-life situations.

學生展示專題的製作過程，並說明這項技術如何應用於現實生活中。