The G2 KCFS Gazette
Kang Chiao International School, Hsinchu Campus, International Department
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The Wind Is Coming
起風了

Renewable Energy: Wind Turbines

Wind turbines are machines that use wind to make electricity. They work the opposite of a fan. A fan uses electricity to make wind, but a wind turbine uses wind to make electricity. When the wind blows, it spins the blades. The blades turn a rotor, which spins a generator to create electricity.

As part of this project, students also learned the difference between *sustainable* and *non-sustainable* energy. Sustainable energy, like wind and solar power, comes from sources that won't run out and don't hurt the Earth. Non-sustainable energy, like coal and oil, can cause pollution and will run out one day. Students learned that wind energy is clean and better for the planet.

Our Wind Turbine Project

First, students learned how wind forms and where the best places are to put wind turbines. They talked about why turbines are often built in the ocean and asked lots of great questions about storms and safety.

Next, the students got a challenge: build their own wind turbine! The goal was to make a turbine that could spin fast and stay standing. They used a base design like the strong "jacket" bases used in Taiwan's ocean turbines.

Each group tested turbines with different numbers of blades to see how it affected spinning. They used fans to test their turbines and observed which designs worked best. After testing, they discussed what worked well and what needed improvement. Then, they made changes to improve their designs.

可再生能源：風力渦輪機

風力發電機是一種利用風力來產生電力的機器。它的運作方式與電風扇剛好相反。電風扇是用電來產生風，而風力發電機則是利用風來產生電。當風吹動葉片時，葉片會帶動轉子旋轉，進而驅動發電機產生電力。

在這項專題中，學生也學習可再生能源與不可再生能源之間的差異。像風能和太陽能這類的可再生能源，是取之不盡且對地球無害的；而像煤炭和石油這類不可再生能源，則會造成污染，且有一天會用盡。學生學到風能是一種乾淨、對地球更友善的能源。

我們的風力渦輪機專題

首先，學生學習風如何形成，以及安裝風力發電機的最佳地點。他們討論為什麼渦輪機常常設置在海上，並提出許多關於風暴與安全性的好問題。

接著，學生獲得一個挑戰任務：自己動手製作風力發電機！他們的目標是設計一台能夠快速旋轉又能穩固站立的渦輪機。他們使用一種類似台灣離岸渦輪機中「套管式」結構的堅固底座作為設計基礎。

每一小組都測試不同葉片數量的風機，觀察葉片數量對旋轉效果的影響。他們使用電風扇來測試風機，觀察哪種設計表現得最好。測試之後，學生討論哪些部分效果好、哪些地方需要改進，然後根據結果進行調整與優化。

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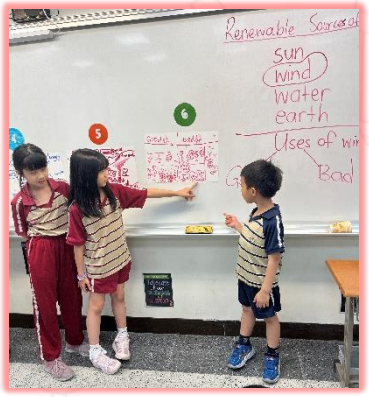
1 ASK + IMAGINE 提問 + 創思 2

We learned about the importance of renewable energy and looked at how Taiwan is creating wind farms.
我們學習再生能源的重要性，並且瞭解台灣如何發展風力發電場。



3 PLAN 計畫

We designed different turbine blades to show how shape and size will affect their spin rate.
我們設計不同形狀與大小的渦輪機葉片，並觀察這些差異如何影響旋轉速度。

4 CREATE 創造

After creating the turbine base and blades, we took them for a test to see how they perform.
在完成渦輪機底座與葉片的設計後，我們進行測試，觀察它們的實際運作。







5 IMPROVE 改進

We had a chance to improve our designs based on our observations during testing.
我們根據測試時的觀察結果，並對設計進行改進與優化。