

The Wind Is Coming 起風了

Renewable Energy

Wind turbines operate on a straightforward principle: rather than using electricity to generate wind, like a fan, they harness wind energy to produce electricity. The wind rotates the turbine's blade-like structures around a rotor, which in turn spins a generator to generate electricity. With a growing wind turbine industry in Taiwan and a focus on sustainability, students found it intriguing to learn about Taiwan's significant involvement in adopting this technology for a greener future.

Wind Turbines

In the initial phase, students delved into the concept of wind and its origins, linking this knowledge to the suitability of specific locations for turbines. Curious about offshore turbine placement and storm resilience, students posed numerous questions. After laying this groundwork, we set a challenge for students to devise and create their own turbines, with the added incentive of determining which could rotate the fastest and remain stable on its base. The base design mirrored the "Jacket" style utilized along the Taiwan coast. Emphasizing blade design, we presented various options for groups to plan and construct a propeller meeting specific criteria. The highlight was testing the turbines to observe the blades in motion. Following testing, students could refine their designs for necessary improvements.

可再生能源

風力渦輪機的運作原理很簡單，它不像風扇使用電力來產生風，而是利用風力來發電。風推動渦輪機的螺旋葉片轉動，帶動發電機並產生電能。當我們展望永續的未來，以及臺灣蓬勃發展的風力渦輪機產業時，學生發現這項科技在臺灣其實非常蓬勃。

風力渦輪機

在專題初期，學生學習風以及風從哪裡來，這些知識與渦輪機適合放置的地點密切相關。學生問了許多問題像是為什麼要在近海建造渦輪機，以及如何抵擋暴風雨等。奠定基礎知識後，老師要求學生規劃並設計自己的渦輪機，並測試哪個渦輪機在其底座旋轉時轉速最快且保持穩定。此底座代表臺灣沿海渦輪機使用的「套筒式」底座。老師介紹葉片的設計及種類，使學生能規劃和建造符合標準的螺旋葉片。最棒的是測試渦輪機的階段，學生可以觀察葉片旋轉，並在測試後對自己的設計進行調整及改進。

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. 我們瞭解了可再生能源的重要性及台灣如何建造風力發電廠。



We designed different turbine blades to show how shape and size will affect their spin rate.

我們設計出不同的渦輪葉片，以展示形狀和尺寸如何影響其轉速。

3

PLAN
計畫

4



4

CREATE
創造

5

After creating the turbine base and blades we took them for a test to see how they perform. 做完渦輪機後，我們進行測試。



5

IMPROVE
改進

6

We had a chance to improve our designs based on our observations during testing. 根據測試中的觀察改進我們的渦輪機。

