

June, 2023

## Harnessing Wind Power

### 利用風力發電

#### The Problem at Hand

In this project, the grade 6 students were tasked with the question, "How can you design a model wind turbine that will lift a load of weight in the quickest amount of time possible?" Students then researched various turbine blade designs and informed themselves of the ideal shape, number, size, and angle for wind turbine blades. They took this research and drew a detailed design for the turbine that they thought would best work to solve the problem at hand.

#### Designing and Creating the Turbines

After completing their designs based on the research, the students used the design to bring their wind turbine model to life. They had fun working together in their groups and it was great to see them working so well together, splitting up work, listening to each other's ideas, and offering input for improvement along the way.

#### Testing the Turbine Models

After the students finished building their model turbines, it was time to test them using a strong fan. The team who was able to lift all of the required amount of weight in the fastest time was the winner. The fastest time was 4.97 seconds! The students had a great time testing their turbines and making observations of how to improve them moving forward.

#### 眼前的問題

在這項專題中，六年級的學生被要求回答一個問題：「如何設計一個模型風力渦輪機，可在最短的時間內提起一定重量的負載？」學生隨後研究各種渦輪葉片的設計，並瞭解適用於渦輪葉片的理想形狀、數量、大小和角度。他們將這些研究成果應用到設計中，繪製他們認為最能解決手頭問題的渦輪機詳細設計。

#### 設計及製造渦輪機

根據研究完成設計之後，學生利用這些設計將他們的風力渦輪機模型製作成真實的作品。他們在小組合作中度过愉快的時光，看到他們能夠良好地合作、彼此分工、傾聽各自的想法，並提供改進的建議，這真是太棒了！

#### 測試渦輪模型

學生完成風力渦輪機模型的製作後，接下來是使用強力風扇對其進行測試。能夠在最短的時間內提起所有所需重量的小組將成為贏家，最快小組的時間是 4.97 秒！學生在測試他們的渦輪機時非常開心，並觀察如何改進渦輪機以進一步提升性能的方法。

#### 1 ASK + IMAGINE 提問 + 創思

Students did research on optimal blade shape, size, and angles.  
學生對葉片形狀、大小和角度進行了研究。



#### 3 PLAN 計畫

Students used the research on optimal blade characteristics to draw a detailed design.  
學生利用對葉片特性的研究繪製詳細的設計圖。



#### 6 PRESENT 展現

Each group presented their findings to the class and compiled a report of their findings.  
每組向全班同學介紹研究結果，並編寫報告。



#### 4 CREATE 創造

Students brought their designs to life and got creative with building their wind turbine models.  
學生實現他們的設計，並在構建風力渦輪機模型時展現出創造力。



#### 5 IMPROVE 改進

After testing, students reflected on their results to make improvements to their designs.  
測試後，學生反思他們的結果，並改進他們的設計。

