

## Sail Cars 帆船車

### Creative Challenge

Groups of students were engaged in creative thinking to design and construct their own sail cars. The challenge was that they had to go the furthest distance possible while only using only the power of the wind. Students learned they needed to plan and design a hull, mast, sail, and wheels for their car.

### Investigating the types of Friction

The students investigated the two types of friction that would affect the cars movement; fluid friction and rolling friction. They discovered that different surfaces and the shapes and sizes of objects affect motion. After exploring how the sails and hulls could affect their cars, they proceeded to brainstorm ideas on how to design and build their cars.

### Testing the Cars

After designing and building their own sail cars, it was time to test the cars. The students collaborated during these processes, constantly trying new ideas to get to the best result. After testing their cars, they recorded each group's results in a data table so they could compare their car's performance against the other groups. After the initial test, they had the opportunity to redesign their car and make it better.

### 創意挑戰

學生分組進行創造性思維並設計及製造帆船車。在僅靠風力的情況下將帆船車移動到最遠的距離是他們要面臨的挑戰。學生們了解到他們需要為他們的帆船車規劃和設計船體、船桅、風帆和帆船車輪。

### 研究摩擦的類型

學生研究兩種會影響車子移動的摩擦狀態：滾動摩擦及流體摩擦。他們發現不同的表面、物體的形狀及大小會影響動力。在探討風帆和船體如何影響他們的車子後，他們開始集思廣益地思考如何設計和製造他們的帆船車。

### 測試帆船

在設計並製造完帆船車後，就是測試的時候了！在這些過程中，學生們互相合作，不斷嘗試新想法，以取得最好的結果。在測試他們的帆船車後，他們將每個組的結果記錄在數據表中，以便可以與其他組相互比較帆船車的性能。經過初步測試後，他們能夠重新設計他們的帆船車並使它變得更好。

### 1 ASK + IMAGINE 提問 + 創思



Students researched how friction affects the motion of objects.  
學生研究摩擦力如何影響物體的運動。

### 4 CREATE 創造



Team members collaborated to build their prototypes.  
小組成員互相合作，建立他們的原型。

### 6 PRESENT 展現

Students collaborated on their final report, before presenting their findings to the class.  
在學生向全班同學介紹他們的結論之前，他們先合力完成最終報告。

### 3 PLAN 計畫



Teams brainstormed the best way to create their prototype.  
經過小組集思廣益，討論能夠製造出原型的最佳方法。

### 5 IMPROVE 改進



After testing, students used what they learned from the test results to improve their designs.  
測試後，學生們利用從測試結果中學到的知識來改善他們的設計。

