

實驗1 | 「漂浮物體」

Experiment 1 | "Floating Objects"





為什麼船可以浮？

Why Can a Boat Float?



型態？

重量？

物料？

所需材料

Materials Required



各種小物體
(例如：迴紋針、塑膠瓶蓋、小橡膠球、木片)

Various small objects
(e.g. paperclip, plastic bottle cap, small rubber ball,
piece of wood)



一個裝滿水的大容器
A large container filled with water



一把尺子用於測量
A ruler for measuring

步驟

Procedure

1

將容器裝滿水

Fill the container with water.



2

將每個物體逐一放入水中

Introduce each object into the water one at a time.



3

觀察並記錄每個物體是浮還是沉。

Observe the note whether each object floats or sinks



4

測量並記錄每個漂浮物體的大小(體積)

Measure and record the size (volume) of each object that floats.



控制實驗

Control
Experiments



使用相似的容器裝不同的液
體(如油)以比較結果

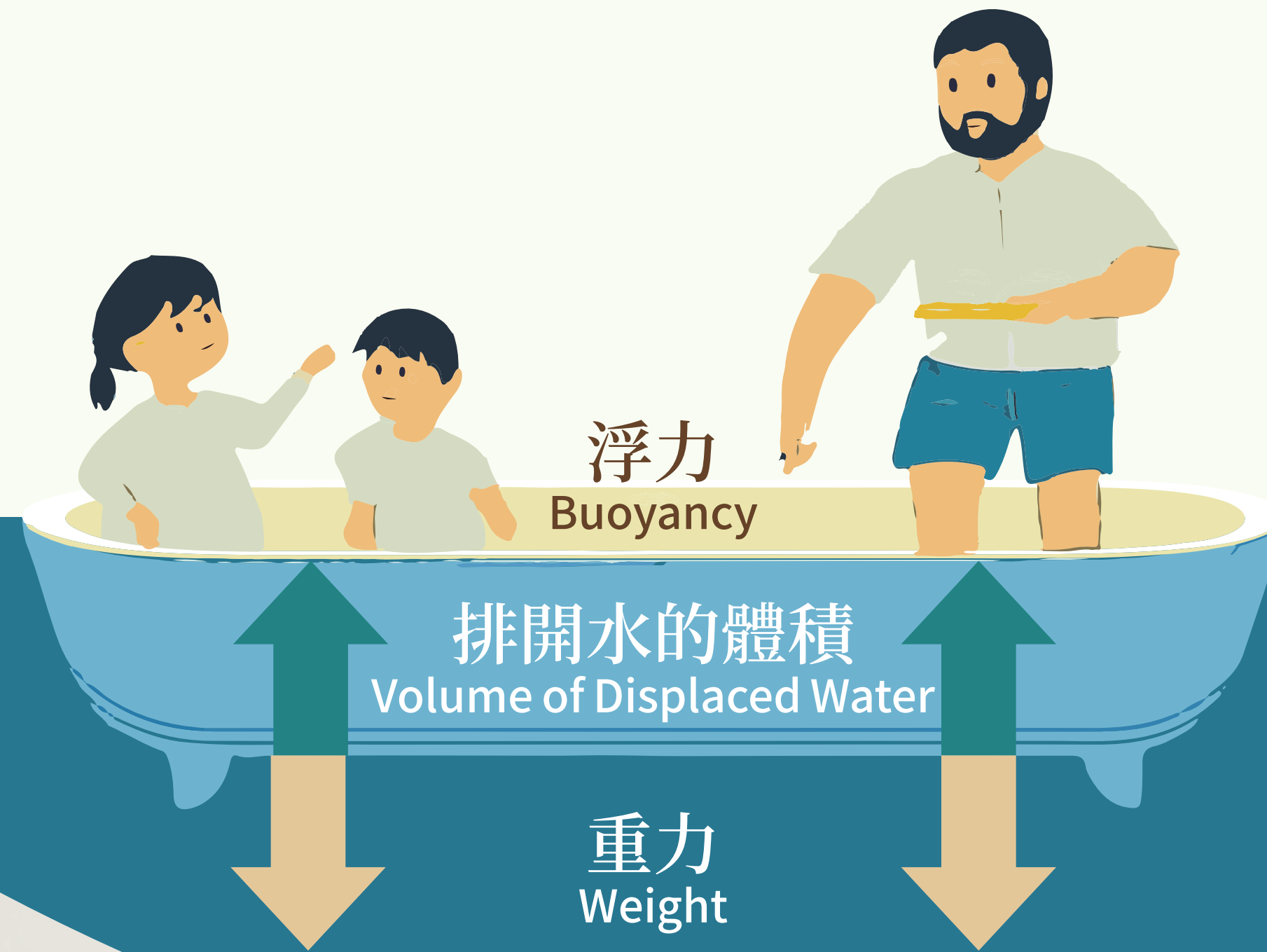
Use a similar container with a different
liquid (like oil) to compare results.





為什麼某些物體浮起，而其他物體沉下

So Why Do Certain Objects Float While Others Sink?



阿基米德原理

Archimede's Principle

當物體排開的水的體積等於其重量時，物體會浮起。
An object will float if it displaces a volume of water equal to its weight.



錫紙實驗

Aluminum
Foil
Experiment



兩張相同重量的錫紙
Two pieces of aluminum foil
of the same weight.



摺成一個兜, 好似一艘船
Twist it into a scoop, like a boat.



握成一個球
Press it into a solid ball

如何做 到

How
to
Achieve...



一個浮
One Sinks

一個沉
One Floats





錯誤想法
Misunderstanding



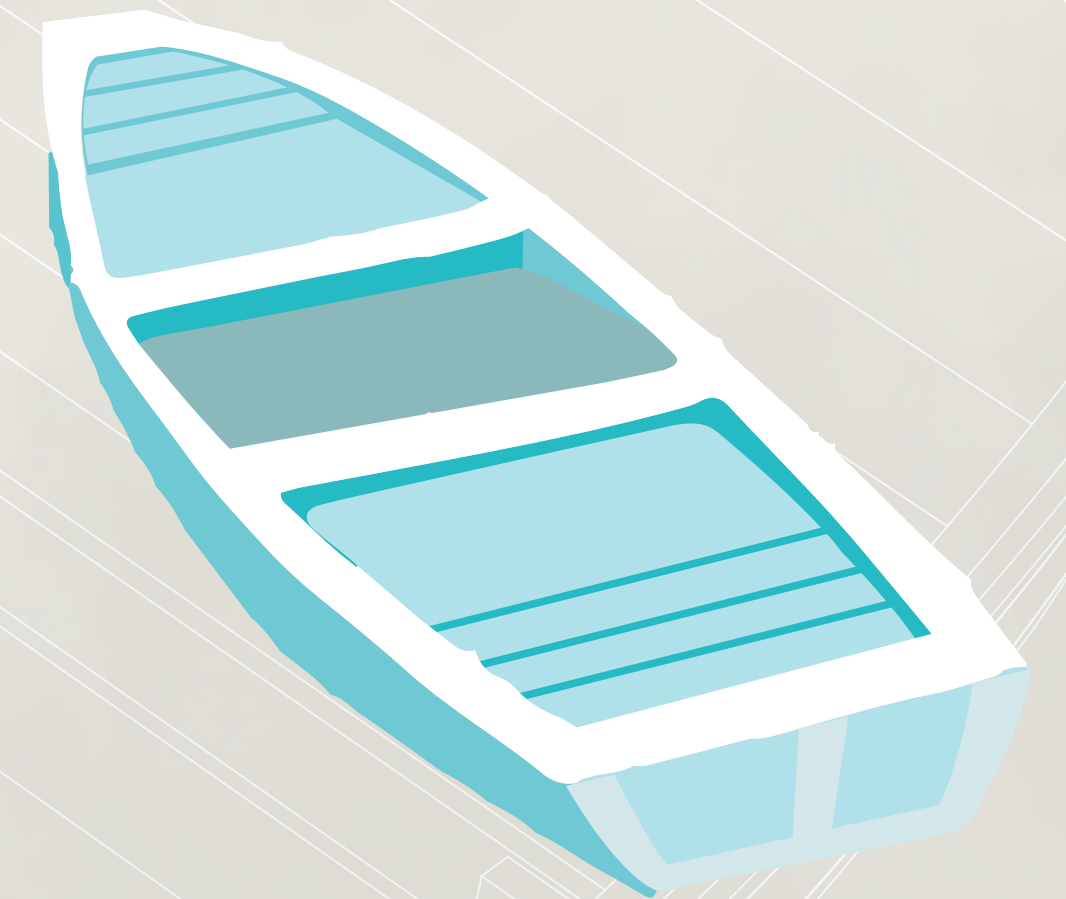
「重的就會沉；輕的就會浮」
The Heavy Will Sink; The Light Will Float





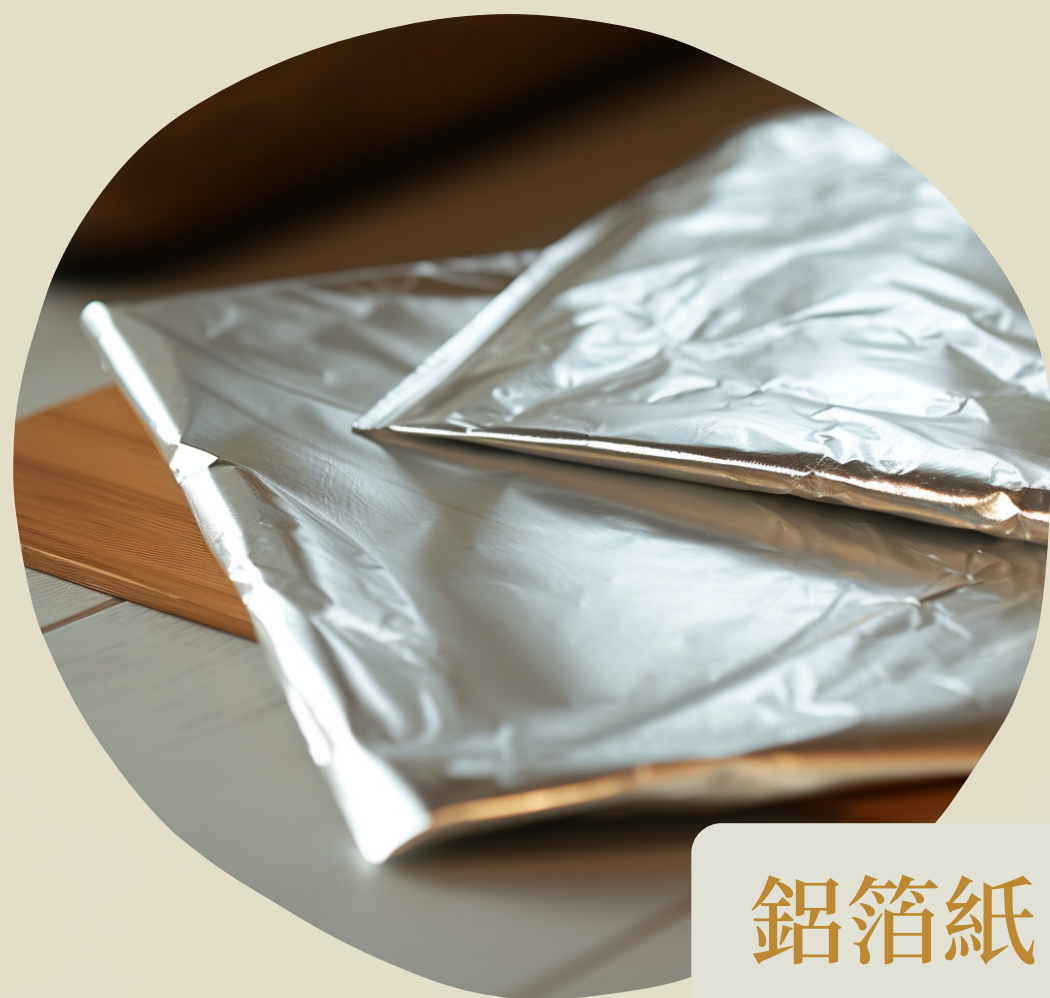
實驗2 | 「建造船隻挑戰」

Experiment 2 | "Boat Building Challenge"

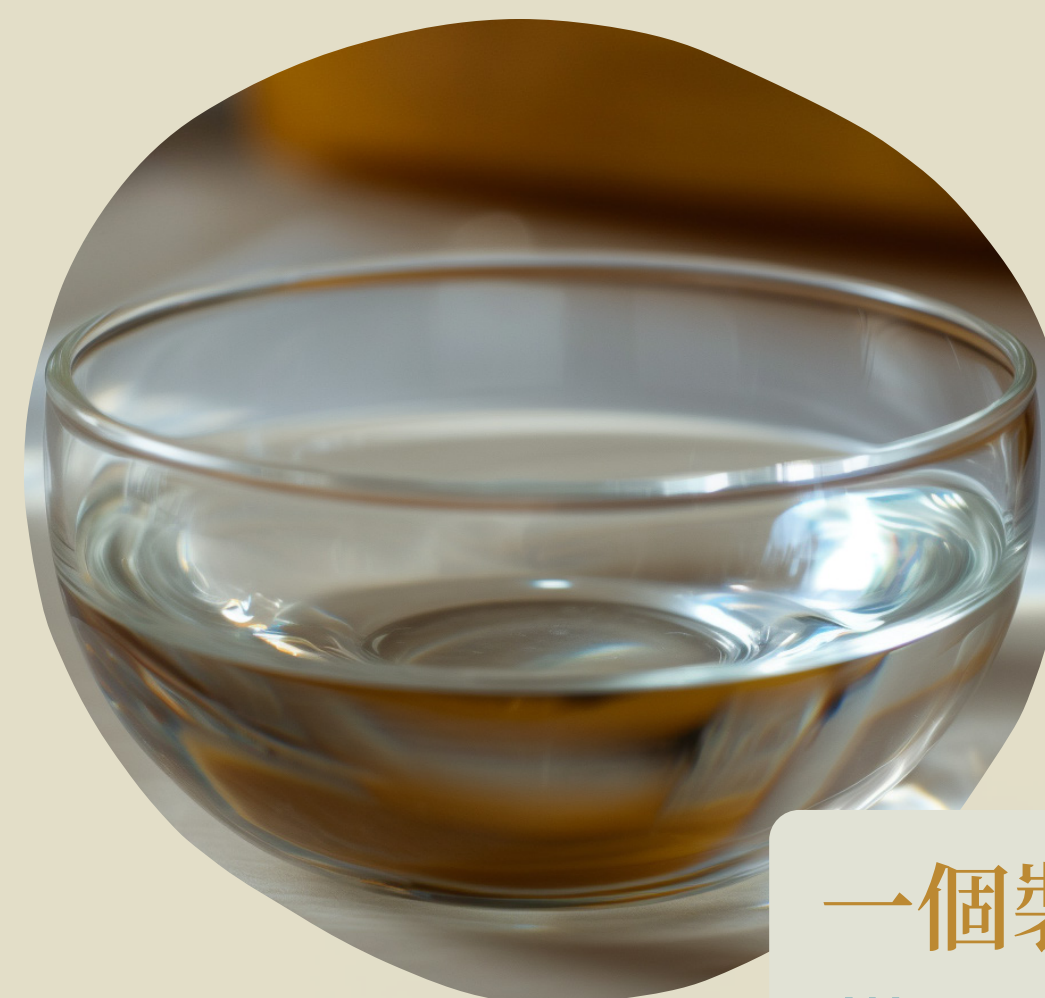


所需材料

Materials
Required



鋁箔紙
Aluminum foil



一個裝滿水的大容器
Water-filled Container



重物 (例如:硬幣)
Weights (e.g. coins)



一把尺子
Ruler



挑戰

Challenge!

建造一隻 可以承載最多重量而不沉的船！

Build a boat that can hold the most weight without sinking!

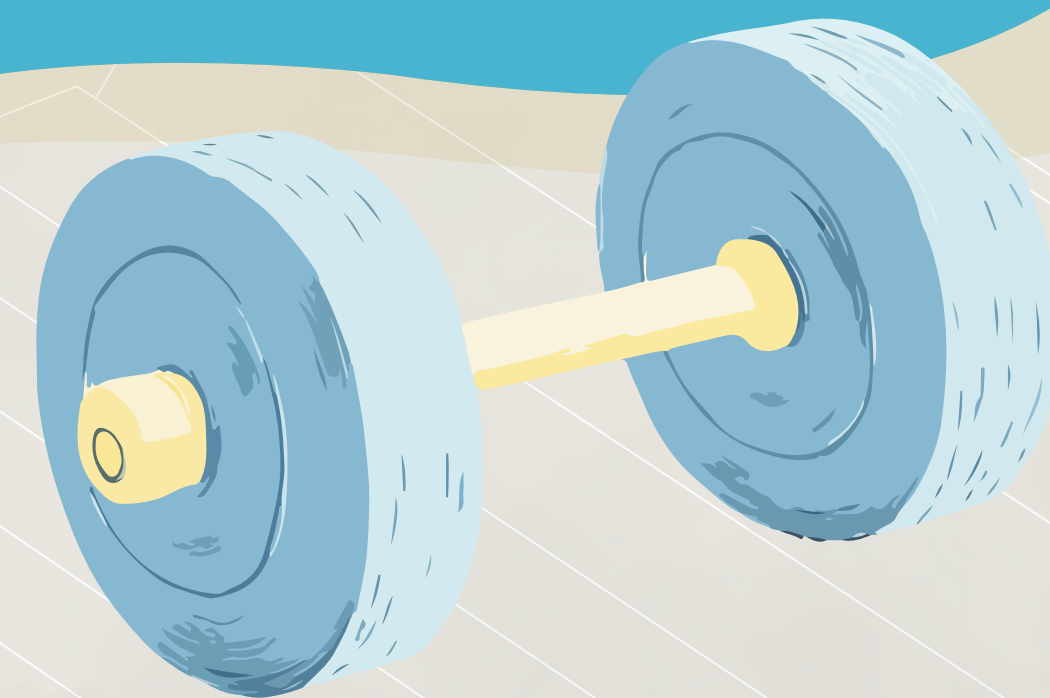


挑戰

Challenge!

逐步添加重物...直到船沉下!
Add weights... until the boat sinks!

測量每艘船所能承載的重物量
Measure the amount of weight each boat held.



船的形狀和設計...

How does the shape and design of the boat....

如何影響其漂浮能力

affect its ability to float

討論

Discuss



如何

How to

加強浮力和阿基米德原理的概念

Reinforce the concept of buoyancy and Archimedes' principle



理解問題

Understanding
Questions



什麼使物體漂浮

What makes an object float



為什麼船可以浮，即使它很重

How can a ship float even though it's heavy

多項選擇

Multiple
Choice

以下哪個物體會漂浮?

Which of the following objects will float?

A

金屬球

A metal ball

B

橡膠鴨

A rubber duck

C

石頭

A rock

D

小車

A small car

多項選擇

Multiple
Choice

以下哪個物體會漂浮?

Which of the following objects will float?

A

金屬球

A metal ball

C

石頭

A rock

B

橡膠鴨

A rubber duck

D

小車



多
項
選
擇

Multiple
Choice

什麼原理解釋船為何漂浮？

What principle explains why boats float?

A

重力
Gravity

C

力量
Force

B

阿基米德原理
Archimedes' principle

D

壓力
Pressure



多
項
選
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Multiple
Choice

什麼原理解釋船為何漂浮？

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阿基米德原理
Archimedes' principle



D

壓力
Pressure

反思

Reflect



描述一下你觀察過的漂浮或沉下的事情...你從這次經歷中學到了什麼？

Describe a time when you observed something floating or sinking...What did you learn from that experience?



反思

Reflect

答

漂浮物體：物體是否會漂浮取決於它們相對於水的密度。

船隻挑戰：船隻由於其設計能排開足夠的水而浮起。

Floating Object: Objects float based on their density compared to water.

Boat Challenge: Ships float due to their design, which allows them to displace enough water.

