

# 加工程師 JUNIOR ENGINEER

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#### 零件表 Kit Contents



#### 零件表 | Kit contents

號碼	No. 描述 Desc	ription	數量Q	ty. 品號 Item No.		
0	B-上弦顆粒	B-CONVEX	8	880-W10-R1G4		
2	B-正方顆粒	B-CUBE	8	880-W10-A1YG		
3	A-90度結合器	A-LATERAL PEG	4	7331-W10-M1G1		
4	A-直線結合器	A-FRONT PEG	4	7331-W10-D1G1		
5	A-多向轉接器	A-2cm CUBE PEG	2	7331-W10-D3G1		
6	A-單孔單向軌道	A-TRACK END	1	7330-W11-P10		
0	A-1凸單孔弧三角顆粒	A-ARC TRIANGLE FLAT PEC	3 2	7330-W85-U1G		
8	A-單孔結合器	A-ROD CONNECTOR	2	7331-W10-E1O1		
9	A-方形船體	A-HULL C	2	7269-W10-B1B		
10	A-尖形船體	A-HULL A	2	7269-W10-A1B		
1	A-圓弧形船體	A-HULL B	2	7269-W10-A2B		
P	A-40mm圓棒	A-40mm CONNECTOR	8	7268-W85-B1O		
13	A-80mm圓棒	A-80mm CONNECTOR	2	7330-W85-A10		
1	A-活動眼球	A-EYE	2	7261-W85-A		
15	A-2孔長條	C-2HOLE DUAL ROD	2	7330-W85-H1K		
16	A-2×3孔長方框	A-3X2 HOLE BASE	1	7330-W85-C1O		



#### 注意!

在組裝步驟中很難區分這兩種長度 的圓棒,所以它們分別被標上號碼, 讓你知道該用哪一個。

#### Note!

The two lengths of connector can be difficult to tell apart in the building instructions. They are numbered in the instructions so you know which one to use.

#### 親愛的家長及大人們:

工程是一個很有趣,涵蓋範圍很廣的領域。在這學習套件中包含有故事繪本及組裝說明書,提供教導學齡前的幼兒 學習簡單的機械工程概念。

為您的孩子朗讀故事繪本並組裝書中主要角色的模型,跟隨書中主角的冒險旅程;**主角在冒險的旅途遇到了各種不同的船隻。**依照書中的內容您的孩子可以在您的協助下,組裝出十種船的模型。模型船的船體都是可以浮在水上的,在幼兒組裝模型的同時,他們也可以學到浮力、排水量、體積及重量的概念;同時也能認識各種不同類型的船。大尺寸及色彩鮮艷的塑膠積木零件,讓幼兒的小手可以輕易的組裝出各個不同的模型。

組裝模型是以搭建的方式一個步驟接一個步驟地進行,這需要一點的練習及耐心。當孩子需要您的幫忙時請家長協助他,但同時也讓他們自己試著去組裝出模型。您的孩子會很樂意有您的幫忙,特別是在遇到某些困難點時。

我們希望您及您的孩子都可以獲得組裝,發現及學習的樂趣!

#### 安全資訊

#### 警告:

窒息的危險…內含小零件。

- 本產品不適合三歲以下的幼兒。
- >>>> 警告!本產品不適合三歲以下的幼兒。
  窒息的危險…內含小零件可能造成誤食及窒息。
- >>> 請保留包裝及說明書,內含重要的資訊。
- >>> 請將實驗的材料及模型配件,放置在幼小兒童拿不 到的地方。
- >>> 警告!若需將模型放入水中,請務必留意水的深度, 並且需有成人在旁督導。

在實驗完成後,須將所有的零件晾乾再放回零件收 納盒中。

#### **Dear Parents and Supervising Adults,**

Engineering is an extremely exciting and vast field. This kit, along with its illustrated storybook and instruction manual, provides an engaging way to teach simple engineering concepts to preschoolage kids.

Read the story with your child and build the simple boat models that the main characters build in the story. Along their journey in the story, the characters must build different boats to solve problems and complete tasks. As you follow the story, your child can build models of the ten boats in the story with your help. The primary functional components of the boat models are floating hull pieces. Your child will be introduced to the scientific concepts of buoyancy, displacement, volume, and weight while building the models. They will also learn about different types of boats. Large, colorful plastic building pieces make it easy for small hands to put the models together.

The models are assembled step by step using a construction system. It will require a little practice and patience at first. Please assist your children when they need your help, but also let them try to build the models by themselves. Your children will be happy to have your help with the models or assembly steps that pose particular difficulties.

We wish you and your child lots of fun building, discovering, and learning!

#### **Safety Information**

#### Warning!

CHOKING HAZARD — Small parts.

Not for children under 3 yrs.

#### Warning!

Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled.

Keep packaging and instructions as they contain important information.

- » Keep the packaging and instructions as they contain important information.
- Store the experiment material and assembled models out of the reach of small children.
- »» Warning! Only to be used in water in which the child is within its depth and under adult supervision.

After completing an experiment, dry all parts completely and return them to the box for storage.





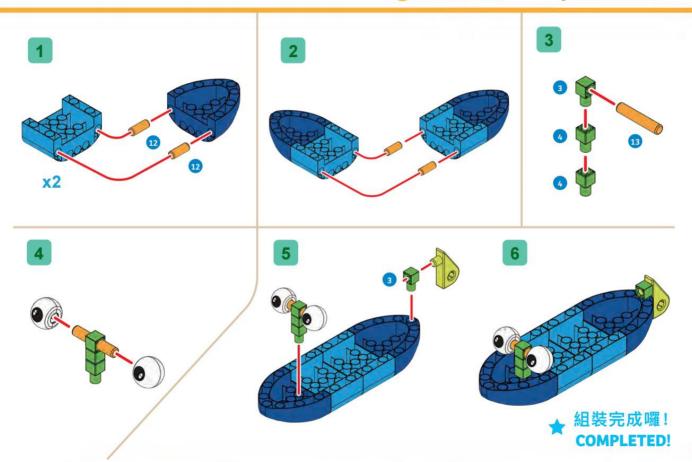
## 你知道嗎

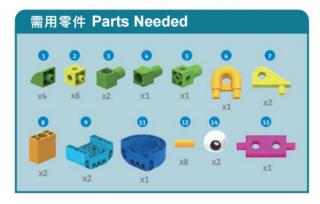
獨木舟是種狹長形的船,兩端呈尖頭狀;船的前頭稱為船頭,後面稱為船尾。獨木舟的船身比水重,但它卻不會沉入水中;主要是因為獨木舟的形狀,船本身所排開的水量比它本身重量還要多。因此,獨木舟可以浮在水面上。如果把獨木舟的模型放在裝水的洗手台或浴缸裡漂浮,並且在船上放入重物。當你增加船的載重量時,你注意到船在水中的高度改變了嗎?

# WHAT'S UP

A canoe is a long, narrow boat with two pointed ends. The front of a boat is called the bow and the back is called the stern. A boat's hull is heavier than water, but it does not sink. Because of its shape, the boat displaces (or pushes away) an amount of water greater than its own weight. Therefore, it floats on the water. Try floating the model canoe in a sink or tub filled with water. Put heavy objects into the boat. Do you notice about the height of the boat changing in the water when you add more weight on to the boat?

## 1 獨木舟奇米 Kimmy The Canoe







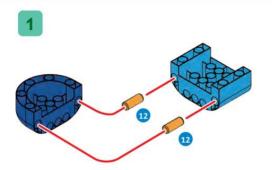
沼澤船螺旋槳不會像一般船隻會浸泡在水中,如此螺旋槳就不會卡在泥巴中或是被沼澤中的植物纏住。相反的,沼澤船的螺旋槳可以像風扇一樣非常快速的轉動,並向後吹出空氣,空氣往後吹動的力量,就會推動沼澤船往前進。那也就是沼澤船如何能夠穿越過沼澤的原因,但是別忘了戴上耳塞,它的風扇轉動時可是會發出極大的聲響喔!

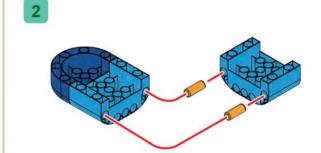


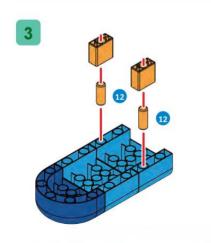
# WHAT'S UP

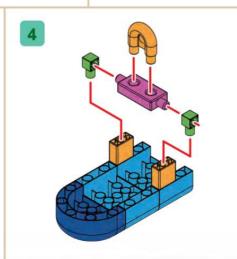
The swamp boat's propeller doesn't stick down into the water like on a normal boat, so it can't get caught in the mud or swamp plants. Instead, its propeller spins very fast like a fan and blows air backwards. The force of the air blowing backwards pushes the swamp boat forwards. And that's how the swamp boat glides across the swamp. But don't forget your earplugs — the swamp boat fan is really loud!

## 2 沼澤船史提 Stevie The Swamp Boat

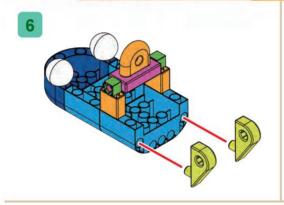


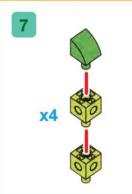


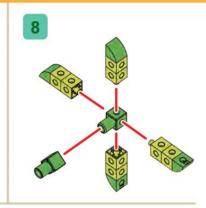


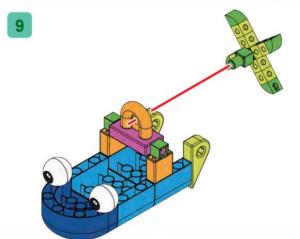














## 3 帆船珊咪 Sammy The Sailboat





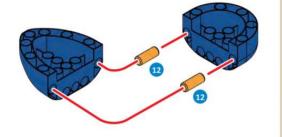
# 你知道嗎

帆船是藉由風力吹動來做為往前的動力,帆船 的種類有好多種;從小型單人只有一個風帆的 帆船,到大型有許多桅桿及風帆的帆船。在蒸 汽引擎及汽油引擎發明之前,船帆是用來做為 船動力最主要的方式。

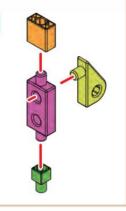
# WHAT'S UP

Sailboats are pushed through the water by their sails. There are many types of sailboats, from small single-person sailboats with just one sail, to huge sailing ships with many masts and many sails. Before steam engines and gasoline motors, sails were the primary means of powering boats.

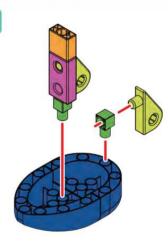
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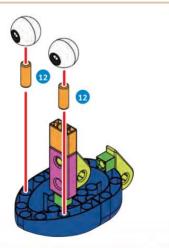




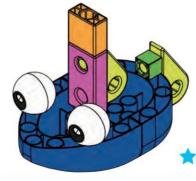
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A



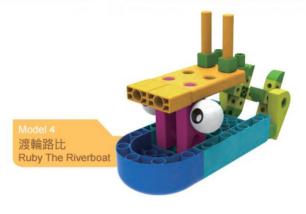
5



組裝完成囉! COMPLETED!





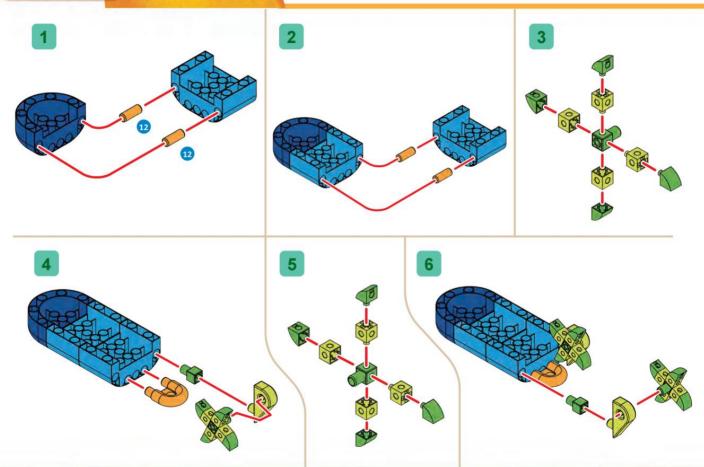


# 你知道嗎

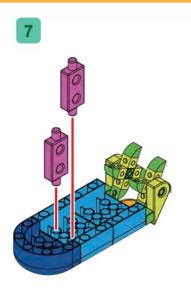
渡輪在船尾有個大輪子,在輪子上面有許多的 葉片及槳。渡輪的蒸汽引擎讓輪子轉動,也讓 葉片一個接一個的在水中轉動。它的葉片將水 往後推動,連帶的也讓渡輪往前進。渡輪常用 於河流上貨物運輸或是乘客載運,並作為觀光 旅遊的用途。

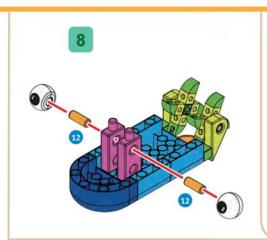
# WHAT'S UP

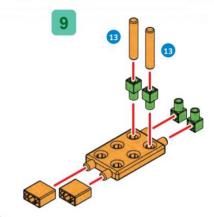
The riverboat has a large wheel on its stern with many paddles, or blades, on it. Its steam engine makes the wheel turn, and one after the other, the paddles push into the water. They push backwards against the water which pushes the riverboat forwards through the water. The riverboat is often used for transporting cargo or carrying passengers on the river and for sightseeing purposes.

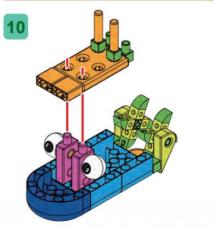


## 4 渡輪路比 Ruby The Riverboat

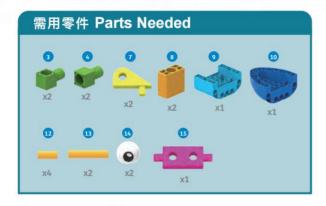
















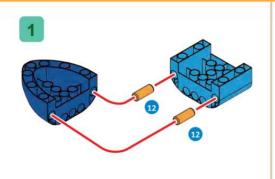
# 你知道嗎

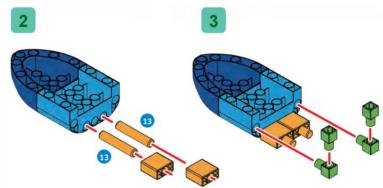
快艇是專為速度快而設計,它並不載運太重的 貨物,也不是最大型的船;但可以在水中以極 快的速度前進。快艇的船尾有個轉速非常快的 螺旋槳,轉動時會排出大量的水。仔細看一下, 快艇尖形的船頭也可以讓它更快速的前進喔!

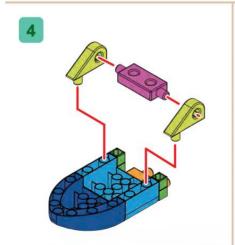
# WHAT'S UP

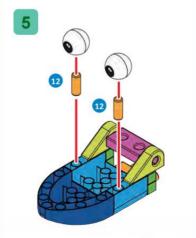
Speedboats are designed for speed. They can't carry too much weight and they aren't the biggest boats, but they can race through the water at tremendous speeds. Speedboats have propellers in the back that spin very fast and push large volumes of water out behind the stern. Take a closer look! The speedboat's pointed bow can also make it faster.

## 5 快艇史杜 Stu The Speedboat















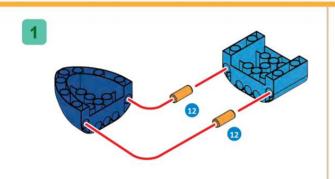
救難艇是專門用在海難時救援乘客、水手或搶救船艙內的貨品,救難艇上有消防設備,可以吸水和噴灑水柱撲滅船上的火災。它們可以到達消防車所倒不了的地方,而且從不怕會沒有水用。 現代的救難艇配有電子設備,像是: 收音機或是雷達,能夠更有效的拯救倖存者。

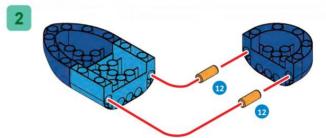
Model 6 救難船芬妮 Frannie The Fire Rescue Boat

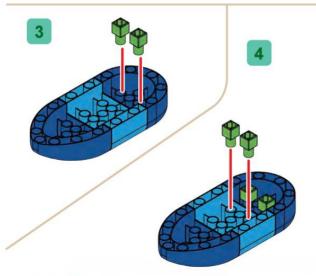
# WHAT'S UP

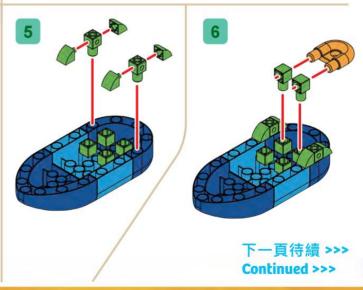
A fire rescue boat is used to assist a vessel in distress, to rescue crew and passengers, or to rescue cargo in the cabin. Fireboats have pumps that can take up water and spray it on the shoreline or on shipboard fires. They can go where fire trucks can't go, and they never run out of water! Modern rescue boats are equipped with electronic devices, such as: radio and radar to help locate survivors more effectively.

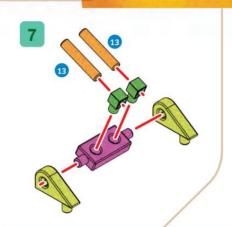
## 6 救難船芬妮 Frannie The Fire Rescue Boat

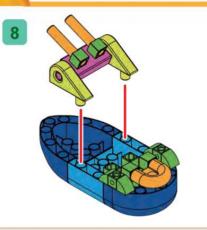


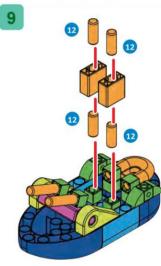


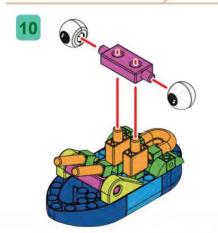
















## 7 貨輪費迪 Freddie The Freighter





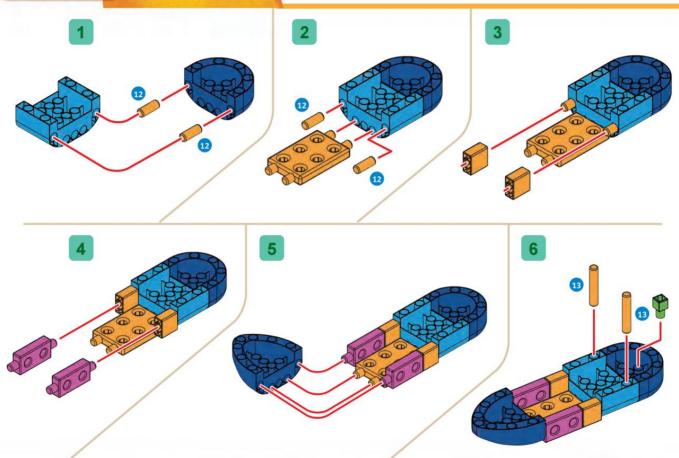
# 你知道嗎

貨輪是巨大的遠洋船隻,在世界各地不同港口之間運送貨物。貨輪讓各地的物品可以相互的交流,也許小朋友你的有些玩具就是經由貨輪從國外運送過來。貨輪重達數千噸,但它們的排水量也很大,即使船上裝載著貨物,它們也不會下沉。

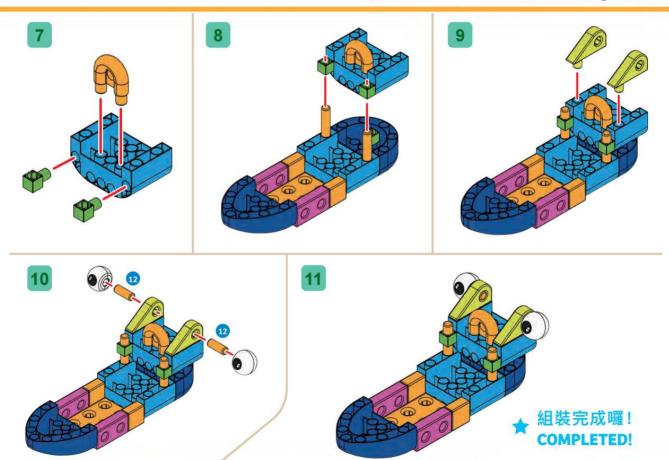
## WHAT'S UP

Freighters are huge ocean-going vessels that carry large amounts of goods around the world, between different ports. They ship goods and allow them to be traded. Perhaps some of your toys have been shipped from abroad. Freighters weigh many thousands of tons, but because they displace a greater amount of water, they won't sink, even when they are loaded with cargo.





## 7 貨輪費迪 Freddie The Freighter







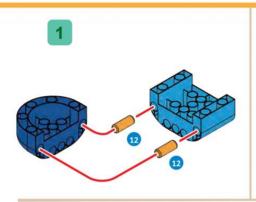
拖船很小但卻很厲害,它可以推拉大型貨輪和船隻,通過狹窄的運河通道和擁擠的港口。拖船的船身有很大的保險桿可以保護它避免被其他的船碰撞到或是去撞到碼頭,它也有一個響亮的啦叭,告知其他船隻它所在的位置。

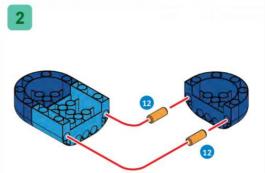


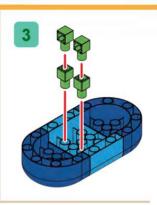
## WHAT'S UP

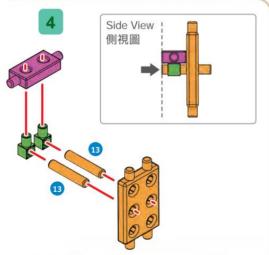
The tugboat is a small but very powerful boat that can push and pull large freighters and ships through narrow passages and crowded harbors. The tugboat has big bumpers all around it, so it can push against the sides of huge boats and to protect it if the tugboat bumps into other boats or piers. The tugboat also has a loud horn so it can tell other boats where it is.

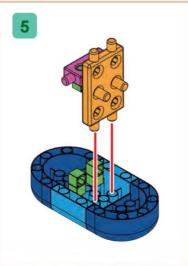
## 8 拖船泰咪 Tammy The Tugboat



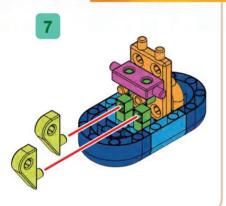


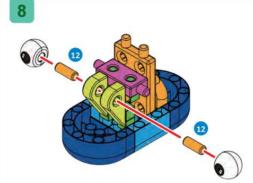


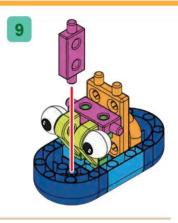


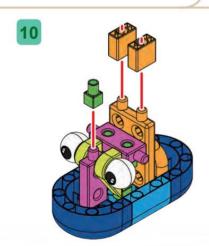














## 9 水上滑行艇韓伯得 Humboldt The Hydroplane

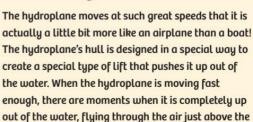




水上滑行艇可以在水上快速移動,事實上它更像一艘飛機而不是船。水上滑行艇的船身經過特殊的設計,能將它從水中往上推。當水上滑行艇跑得夠快時,它幾乎是完全離開水面而飛在接近水面的空中。水上滑行艇不像其他船隻會有水的阻力,沒有水的摩擦力(或是黏著力),所以它可以比其他的船跑得更快。



## WHAT'S UP

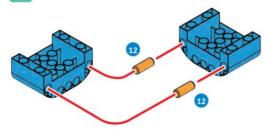


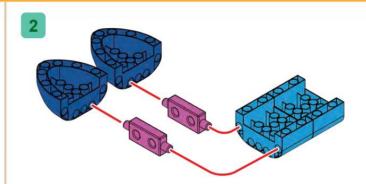
surface of the water. This reduces the friction, or

with less resistance than a typical boat.

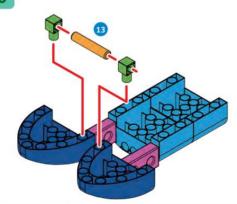
stickiness, with the water so it can move even faster

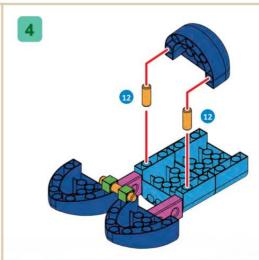




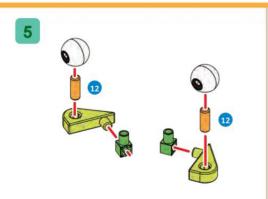


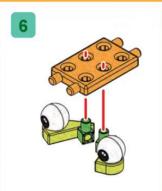
3

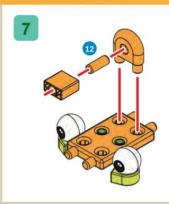


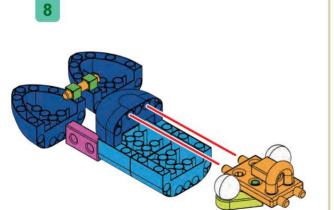


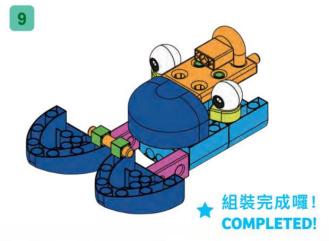
## 9 水上滑行艇韓伯得 Humboldt The Hydroplane















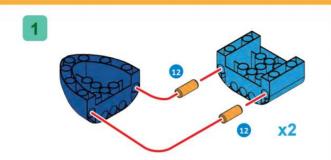
## 你知道嗎

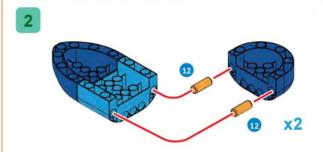
雙艇船有兩個船身而非只有一個,因此,可以 讓它更加平穩。雙艇船不像帆船需要一個長龍 骨伸進水中,以防止船身翻覆。相反的,雙艇 船有一個寬樑可以讓它在水面上非常的平穩。 樑是從船的這一側到另一側的寬度,在大多數 的情況下,樑愈寬,船就愈平穩。

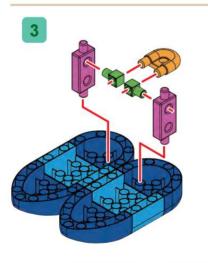
# WHAT'S UP

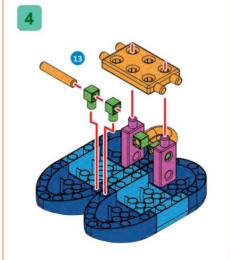
The Catamaran has two hulls instead of one. This helps it to stay very stable in the water. The Catamaran doesn't need a long keel, which is the board that sticks down into the water to prevent a sailboat from tipping over. Instead, the Catamaran's stability comes from its wide beam. The beam is the width of a boat from one side to another. In most cases, the wider the beam, the more stable the boat.

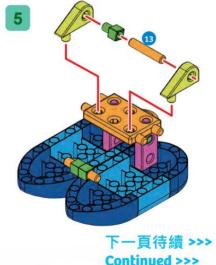
## 10 雙艇船凱拉 Kara The Catamaran



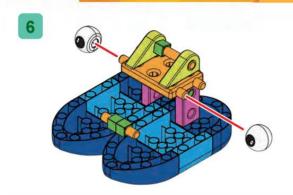


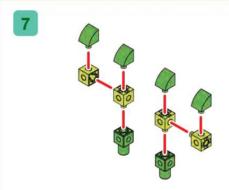


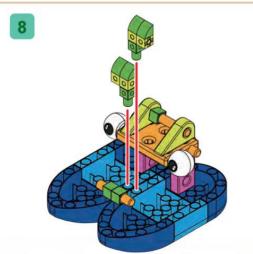




Continued >>>









### 科學小實驗 Bonus Experiment

#### 科學小實驗(1)…浮浮沉沉

實驗看看: 甚麼東西會沉到水裡面,你可以拿一顆 石頭、軟木塞、釘子、橡皮筋、羽毛、一段繩子、塑膠積木或是其他更多的物品來做實驗品。當物品沉入水中,它只是將水排到它的兩側,也就是它的排水量; 物品的排水量取決於它的大小及形狀,而非它的重量。一個物品會沉入水中是它的排水量少於它物品本身; 如果它的排水量多於物品, 那麼水的支撐力就可以將這個物品從水中撐起,那就是為什麼物品可以浮在水面上的原因了。



#### 科學小實驗(2)…船為什麼可以浮在水面上?

將分量相同的黏土捏成各種形狀,包括做成一顆球及船的形狀。 將每種形狀的黏土都放入水中,試試看:哪種形狀的黏土會浮在 水面上?黏土船及黏土球的重量都一樣,但是黏土船的排水量比 黏土球多。因此,更多的水分從船底排出來,讓船可以浮上水面。



#### Bonus experiment (1):What floats?

Test different objects to see whether they are able to float in water. You can test a rock, cork, nail, rubber band, feather, piece of yarn, plastic building block, and more.

When an object sinks in water, it simply presses the water to its sides. It displaces the water. The amount of water an object displaces depends on its size and shape, not its weight. An object will sink if the amount of water that it has displaced (forced aside) weighs less than the object itself. If the displaced water weighs more than the object, then the water supports the object from underneath by pushing up on it, and that's how the object floats.

#### Bonus experiment (2):How do boats float?

Make different shapes with equal amounts of modeling clay, including ball and boat shapes. Test each shape to see if it floats in a bowl of water. The clay boat and the clay ball weigh the same, but the boat displaces more water than the ball. Consequently, more water molecules press against the bottom of the boat, and it floats.











球 (Ball)

黏土船 (Boot)

碟子 (Dish)

石板 (Slab)

手環 (Ring)



## 10 個船的模型 / Models of 10 Boat Engineer



1. 獨木舟奇米 Kimmy the Canoe



2. 沼澤船史提 Stevie the Swamp Boat



3. 帆船珊咪 Sammy the Sailboat



4. 渡輪路比 Ruby the Riverboat



5. 快艇史杜 Stu the Speedboat



6. 救難船芬妮 Fannie the Fire Rescue Boat



7. 貨輪費迪 Freddie the Freighter



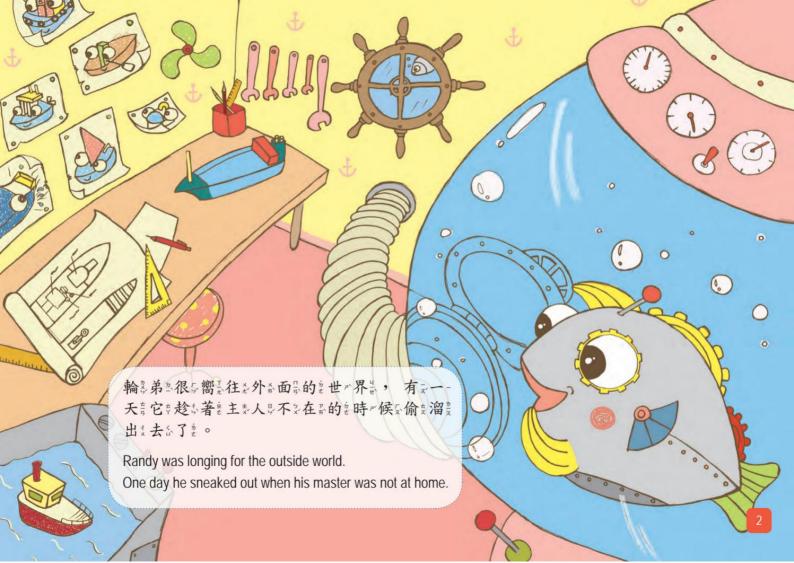
8. 拖船泰咪 Tammy the Tugboat

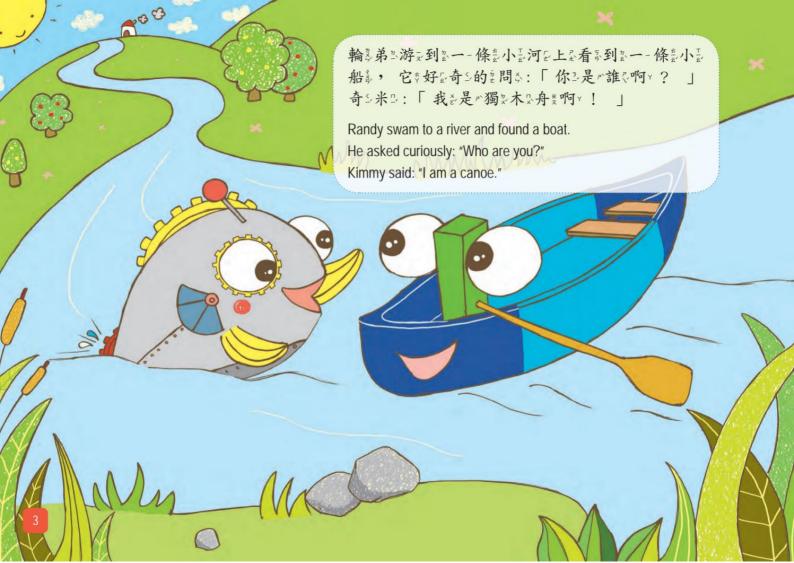


9. 水上滑行艇韓伯特 Humboldt the Hydroplane



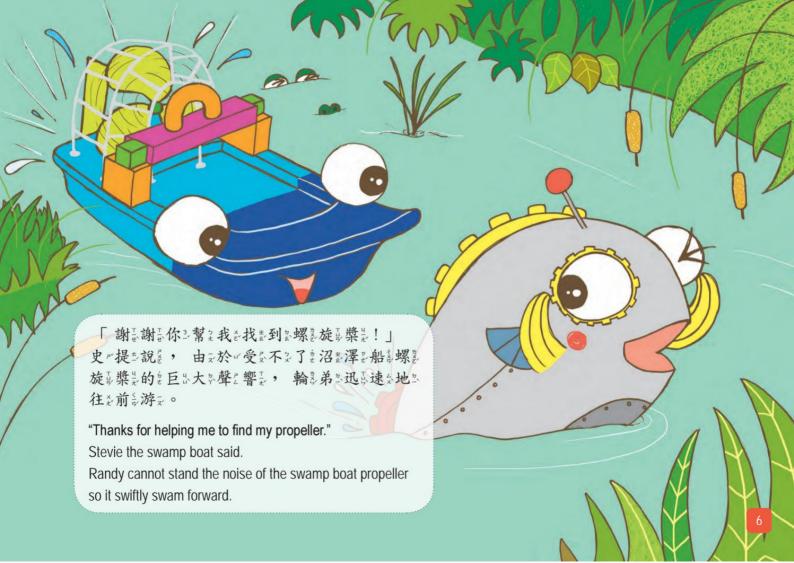
10. 雙艇船凱拉 Kara the Catamaran



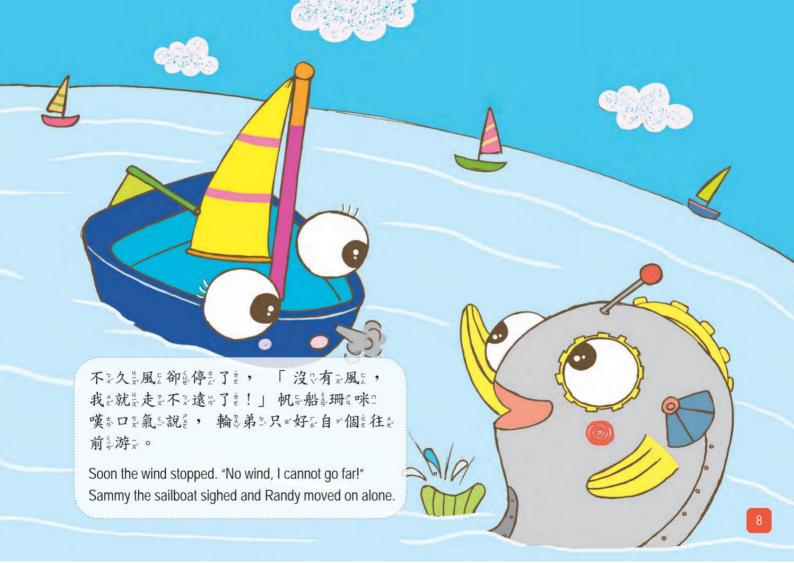












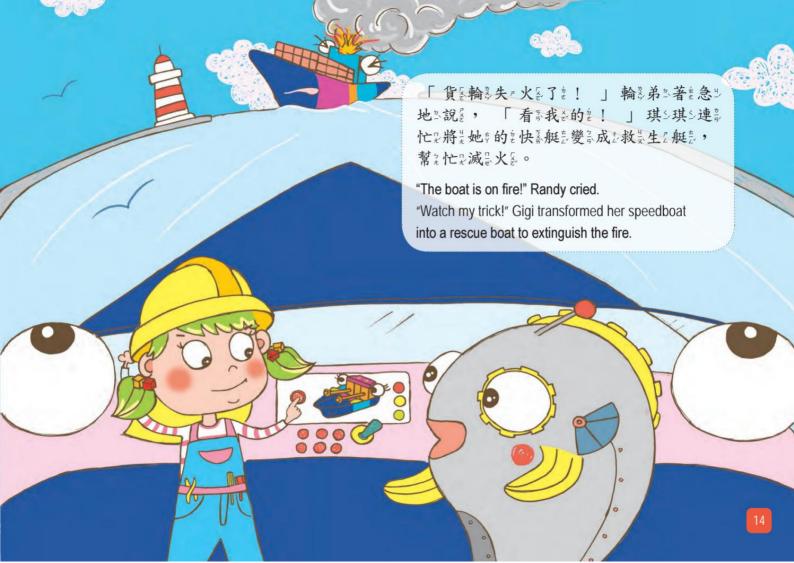
















貨養輪教費を迪力說是:

「謝芸謝芸你之們点! 讓是我会載品的沒貨各物本

沒只有文太奈大公的沒損多失。。」

輪急弟急說是:「真告是严繁是險事啊~!」

Freddie the freighter said:

"My goods were hardly damaged."

Randy said: "That was close!"



