



**WELCOME** to Weekend Science! Every Saturday we're going to guide you through some cool experiments that you can do at home. It's a good idea for you to keep a record of what you do in a Science Journal. That way you can record what you learn, compare results and maybe use them to design new experiments! Remember to always ask a grown-up's permission before trying out an experiment.

歡迎閱讀《週末科學版》！我們每週六都要為你介紹可以在家中進行的有趣科學實驗。你可以在《科學日誌》中記錄自己做了哪些活動，這樣就可以將所學的記錄下來，比較這些結果，也許還可以利用它們來設計新的實驗！先看一下《科學日誌》的點子再開始吧。展開實驗之前，記得要獲得大人許可喔！

## Homemade xylophone will be music to your ears

### 自製木琴樂音揚

For at least the last 4,000 years, **musical instruments** have been an important part of human culture. Early musical instruments were made from **materials** as diverse as tortoise shells and tree trunks, and have evolved into the electronic instruments we use today. In fact, any object that produces sound can be classified as a musical object.

In today's experiment you will make a water bottle xylophone using objects from around the house.

What you will need: six similarly sized glass bottles, water, and a chromatic tuner.

(JOHN PHILLIPS, STAFF WRITER)

### METHODOLOGY

Step 1: Partially fill one of your bottles with water and blow on the top to produce a note. You might have to try a few times to get a sound but you'll get there eventually.

Step 2: Use the chromatic tuner to see which note you have produced.

Step 3: Take another bottle, add more water to the jar and blow. The **pitch** of the note should be higher, but use your tuner to make sure. Keep adding or removing water until the **note** is exactly one note above the one you produced in step one.

Step 4: Repeat step three with the other four bottles until you have made a six step musical scale. Number your bottles from one to six, starting with the bottle with least water in it. Your instrument is finished and ready to play.



Israeli-Argentinian conductor Daniel Barenboim conducts the Vienna Philharmonic Orchestra during a preview of the New Year's concert at Vienna's Musikverein hall in Vienna, Austria on Dec. 30, 2008.

PHOTO: EPA

二〇〇八年十二月三十日，在奧地利維也納愛樂廳內，以色列裔的阿根廷指揮家丹尼爾·巴倫波因指揮維也納愛樂交響樂團，為新年音樂會進行預演。

照片：歐新社

過去至少四千年來，樂器在人類文化中一直扮演著重要的角色。早期的樂器是用龜殼和樹幹等各式各樣的材料製成，隨後逐漸發展成我們今日所使用的電子樂器。事實上，任何能發出聲響的物體都可以被歸類為樂器。

今天的實驗中，我們要利用家中隨手可得的東西來製作一架「水瓶木琴」。

實驗所需：六個大小差不多的玻璃瓶、水和一個調音器。

(翻譯：袁星慶)

### 方法

步驟一：在其中一個瓶子內裝一點水，然後對著瓶口吹出音來。你可能要多試幾次才能吹出聲音，但你最後一定會成功的。

步驟二：利用調音器檢測你吹出的是哪個音。

步驟三：在另一個瓶子內加入比剛剛更多的水，然後吹出音。這個音應該會比較高，但還是請用調音器確認一下。持續加水或倒掉一些水，直到找出正好比步驟一那個音高一度的音。

步驟四：對剩下的四個瓶子重複步驟三，最後，你會得到一組六個連續音階的組合。從裝水最少的瓶子開始，依序將六個瓶子標上一至六的編號。現在，我們的樂器完成了，可以準備吹奏囉。

### PLAYING THE INSTRUMENT

### 演奏樂器

You've made your instrument and now it's time to play it. Blow on the bottles in this order to make a popular **tune**. Can you figure out what it is?

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Variation: Hit the bottles with a pencil instead of blowing and you will notice that the high and low notes have switched **positions**.

你已經完成樂器的製作，現在可以吹吹看了。按照下面的簡譜吹奏水瓶，就可以吹出耳熟能詳的旋律。你發現這是哪首歌了嗎？

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變異：不對著瓶子吹氣，改用鉛筆敲打瓶緣；結果，你會發現高音和低音的位次互換了。

### VOCABULARY 今日單字

- musical instrument** / mju:z kl nstr m nt/ n.  
樂器 (yue4 qi4)
- material** / m tr i/ n.  
材料 (cai2 liao4)
- pitch** / p / n.  
音高 (yin1 gao1)
- note** / not/ n.  
音符 (yin1 fu2)
- tune** / tun/ n.  
旋律 (xuan2 lu4)
- position** / p z n/ n.  
位次 (wei4 ci4)



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Did you have fun with today's experiment? Why don't you e-mail us and let us know.

We're always happy to hear from our readers!

喜歡今天的實驗嗎？歡迎來函指教！電子信箱：bilingual@taipeitimes.com