

Engineering Sound 音訊工程

Discovering sound

Sound is created when something vibrates and sends waves of energy or vibrations into our ears. The vibrations travel through the air to the ear. The stronger the vibrations, the louder the sound.

This project was packed with activities for the students to experience sound through different mediums such as water and air, and by using different objects to transmit sound. They made harmonicas and got to 'see' the sound vibrations. We also looked at how animals use sound to communicate, socialize, and find food. More specifically, we looked at echolocation and the animals who have this gift. We explored echolocation by playing fun class games, and the students got to experience first-hand how echolocation works. We experimented with different materials and ever-day objects to make sounds and resemble real instruments. For example, glass bottles filled with water were used to make the sounds of the xylophone and a ruler was used to mimic the sounds of a finger piano.

Helping the band

The main problem the students had to solve was to build instruments for a band in all three categories, percussion, string, and wind. Firstly, they selected the type of instrument. Then, after studying the material, they decided on and drew a plan to put the instrument together. It took a bit of time and effort but with many helping hands we worked together and produced some amazing instruments. Students decorated and tested them as well. Who knows, we might have some professional musicians amongst these young engineers.

發現聲音

聲音是當某物振動並將能量或振動波送入我們的耳朵時產生的。振動通過空氣傳到耳朵，當振動越強，聲音也就越大。

這個專題包含了許多活動，讓學生透過水和空氣等不同媒介體驗聲音，並使用不同的物體傳遞聲音。學生製作口琴，並「看到」了聲音的振動。我們還研究動物如何利用聲音進行溝通、社交以及尋找食物。更具體地來說，我們研究回聲定位以及具有這種天賦的動物。藉由有趣的課堂遊戲探索回聲定位，學生親身體驗回聲定位的原理，也利用不同的材料以及日常物體進行實驗，使其發出聲音並模仿真實的樂器。例如，裝滿水的玻璃瓶被用來發出木琴的聲音，直尺被用來模仿手指鋼琴的聲音。

組成樂團

學生的主要任務是製作三種類的樂器，分別是打擊樂器、弦樂器以及管樂器。首先，學生選擇一種類別(打擊、弦樂、管樂)的樂器，進行研究並且決定材料，接著擬定將樂器組合出來的計畫。雖然這會花費一些時間，但是在多方的幫忙下，我們共同製作了這些出色的樂器。學生裝飾以及測試這些樂器，在這些小小工程師中或許會有出色的音樂家呢！

1 ASK + IMAGINE 提問 + 創思

We discovered sound through different mediums.
我們透過不同媒介發現聲音。



3 PLAN 計畫

We combined different materials to design our instruments.
我們結合不同材料來設計樂器。

4 CREATE 創造

We collaborated and created some amazing instruments.
我們合作創造令人驚嘆的樂器。



5 IMPROVE 改進

Each instrument was tested and improved where needed.
每一種樂器都經過測試，並視其所需加以改進。

