

## Invent It 發明

### The Plastic Problem

Plastic is an amazing man-made material used to make all kinds of important things. Bike helmets, car airbags and many medical supplies made with plastic save lives, and plastic water bottles can bring clean drinking water to people who don't have it. The problem is that most of us use more plastic than we need to, and half of the plastic we produce is designed to be used just once and thrown away. This so-called **'single-use plastic'** is used to make all kinds of items, such as shopping bags, straws, food wrappers and various packaging. And because plastic takes years to decompose, it stays in the natural world, causing damage, for a very long time.

### Biodegradable Plastic and 3D Printing

After exploring and identifying the problem with plastic, the students set to work and came up with ways that we can reduce our use of plastic or how we can reuse certain plastic items. We looked at biodegradable plastic and learned about inventors who shared their innovative ideas to make "better" plastic. Then, we explored 3D printing. This is an additive process, where liquid plastic is layered to create a 3D object. The students then tried their hand at 3D printing by using glue and craft sand. They made their own 2D designs first and then layered the glue to make their 3D prints. It took a lot of concentration to carefully follow their design outlines, but the end results came out great!

#### 塑膠問題

塑膠是一種令人驚奇的人造材料，用來製造各種重要的東西。自行車安全帽、汽車安全氣囊以及許多塑膠製成的醫療用品可以拯救生命，寶特瓶能給沒有水喝的人帶來乾淨的飲用水。問題是我們大多數人使用的塑膠比我們需要的多，而且我們生產的塑膠有一半被設計成一次性使用並丟棄。這種「**一次性塑膠**」被用於各種物品，像是購物袋、吸管、食物包裝紙以及各種袋子。而因為塑膠需要花上數年才能分解，所以它會在自然界中停留很長時間，造成破壞。

#### 可生物分解塑膠及 3D 列印

在探索和發現塑膠的問題後，學生們開始動工，並想出減少塑膠的使用或如何重複使用某些塑膠製品。我們研究可生物分解的塑膠，以及許多分享創新想法，並製造「更好的」塑膠的發明家。接著，我們探討 3D 列印。3D 列印是一種附加製造過程，將液體塑膠分層來創造 3D 物體。學生們接著嘗試 3D 列印，利用膠水跟工藝沙子。一開始，他們先製作自己的 2D 設計，然後將膠水分層以製作 3D 列印。仔細遵循他們的設計需要集中注意力，但最終結果是非常棒的！

1

ASK + IMAGINE  
提問 + 創思

2

We examined the benefits and drawbacks of using plastic.  
我們檢視使用塑膠的優缺點。



3

PLAN  
計畫



Through trial, error, and careful planning, we perfected our 3D printing.  
透過嘗試、錯誤和仔細的計劃，我們完善了我們的 3D 打印。



4

CREATE  
創造



Our 3D printed shapes took a few days to dry before we had a chance to explore them.  
在我們有機會探索 3D 列印成品之前，我們的需花幾天時間晾乾。



5

IMPROVE  
改進



It was very exciting to see our 3D creations.  
看到我們的 3D 作品非常興奮。

