

## Building a Water Filtration System 建構濾水器系統

### Water Treatment Systems

Is the water that you drink clean, or do you use a filter in your house? During this project, students learned about our water resources and all the pollutants that we need to remove from it before it is safe enough for us to drink. They also learned that there are water purification plants that do this job for us in most of the world by using a variety of materials and chemicals. Students had to use this information and creativity to design and build a multi-layered water filtration system to clean dirty water.

### Designing and Testing a Water Filtration System

The students learned about how different sands, rocks, charcoal, and chemicals are layered in specific orders and sizes to remove certain impurities. By doing this, students were able to get rid of most of the different impurities to make the water safe for drinking. Students collaborated in depth about what materials to use and in what order they needed to put the layers to be the most effective.

### Reflection

The students then tested their ideas and designs to see what combination of materials and in what order these materials needed to be for the best result. Students were limited to selecting five out of eight materials. Through these tests, they discovered the best combination and order of the materials in order to achieve the best result. Through this project, the students rediscovered that the more you test something, the better your result will be.

### 水處理系統

你喝的水乾淨嗎？還是你家裡有使用過濾器？在此專題中，學生瞭解我們的水資源，以及我們需要從水資源中去除的所有污染物，直到它足夠安全地供我們飲用。他們還瞭解到，世界上大部分地區都有一些淨水廠，藉由使用各種材料和化學品來完成淨水這項工作。學生必須利用這些訊息和創意來設計和建構多層過濾系統以淨化髒水。

### 濾水器系統的設計與測試

學生學習不同的沙子、岩石、木炭和化學製品是如何分層的，並按照特定的順序和大小去除某些雜質。這樣子做，學生能夠去除大部分不同的雜質，使人安心飲用水。學生深入合作，探討使用什麼材料，以及按照什麼順序排列這些分層，才能達到最有效的效果。

### 反思

接著，學生測試他們的想法和設計，以了解需要什麼樣的材料組合，以及這些材料應如何順序才能獲得最佳效果。學生需從八種材料中選擇五種材料，透過這些測試，他們發現了材料的最佳組合和順序，以獲得最佳的結果。透過這項專題，學生再次發現測試的東西越多，結果就越好。

### 1 ASK + IMAGINE 提問 + 創思



Students are researching where our water comes from and what pollutants are in it. 學生正在研究我們的水是從哪裡來的，裡面有什麼污染物。

### 3 PLAN 計畫



Students are designing their water filters. Then they will choose the best one to create. 學生設計他們的濾水器，並選擇最好的一個來製作。

### 4 CREATE 創造



Students are busy creating and testing their water filters. 學生正忙著製作和測試他們的濾水器。

### 5 IMPROVE 改進



Students are busy improving their water filters. 學生正忙著改進他們的濾水器。

### 6 PRESENT 展現



Students reflect and present their findings to the class. 學生反思並向全班同學陳述他們的發現。