

## Micro-Grid Electrical Circuits

### 微電網電路板

#### Understanding the problem

A micro-grid is a self-sufficient energy system that serves a discrete geographic footprint, such as a college campus, hospital complex, business center or neighborhood. An electric circuit includes a device that gives energy to the charged particles constituting the current, such as a battery or a generator; devices that use current, such as lamps, electric motors, or computers; and the connecting wires or transmission lines.

#### Gathering facts

Students were challenged to solve the problem of interruptions to the electricity supply. Firstly they researched different causes to interruptions of our electricity supply and then found solutions for the disruptions. They discovered that some communities or critical buildings like hospitals can supply their own electricity through a micro-grid or generator. They had to learn about circuits and design a micro-grid for their critical building of choice.

#### Finding solutions

There were many hands on inquiries for the students to learn about circuits, light bulbs and batteries. Each class observed and participated in how light bulbs and batteries can be made from simple household items. They then went on to learn more about circuits through designing and making, graphite, paper, simple, parallel and series circuits. They were able to build circuits in class as well as through an online activity.

#### 理解問題

微電網是一種自給自足的能源系統，分散在不同的地點，例如大學校園、綜合醫院、商業中心或社區。電路板構成電流的物質包含以電池或發電機提供裝置能量；使用電流的設備有燈、電動引擎或電腦，以及連接電線或傳輸線。

#### 蒐集實例

學生挑戰解決電力供應中斷的問題。首先，他們研究造成電力供應中斷的不同原因，並找到造成中斷的解決方案。他們發現一些社區或醫院等重要建築可以通過微電網或發電機為自己供電。他們必須瞭解電路，並為自己選擇的建築物設計微電網。

#### 尋找解決方案

學生透過實際操作理解電路板、燈泡和電池。各班透過觀察了解如何使用簡單的家居用品製作燈泡和電池。通過設計製作與運用石墨、紙並串聯電路，繼續學習更多關於電路板的知識。他們能夠在課堂中以及透過線上活動建構電路板。

#### 1 ASK + IMAGINE 提問 + 創思

We are making batteries, light bulbs and exploring circuits.  
我們製作電池、燈泡和探索電路板。



#### 4 CREATE 創造

We are using and comparing different material to see if they are conductive or not.  
我們運用和比較不同的材料以分辨是否導電。



#### 6 PRESENT 展現

We presented our circuit designs.  
我們展示我的電路設計。



#### 3 PLAN 計畫

Researching the different circuits is important for a good plan.  
研究不同的電路板是個重要的好方法。



#### 5 IMPROVE 改進

Testing and improvements are made throughout the process.  
過程中我們進行測試與改進。

