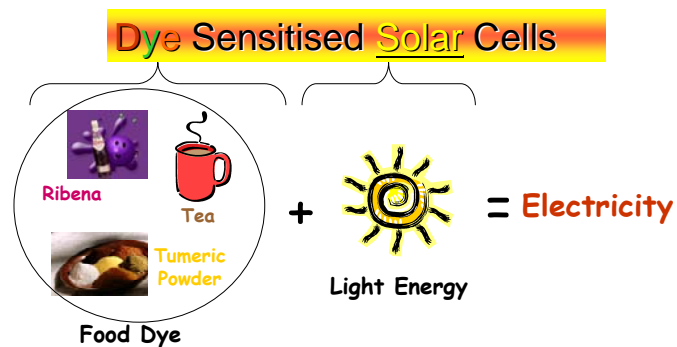


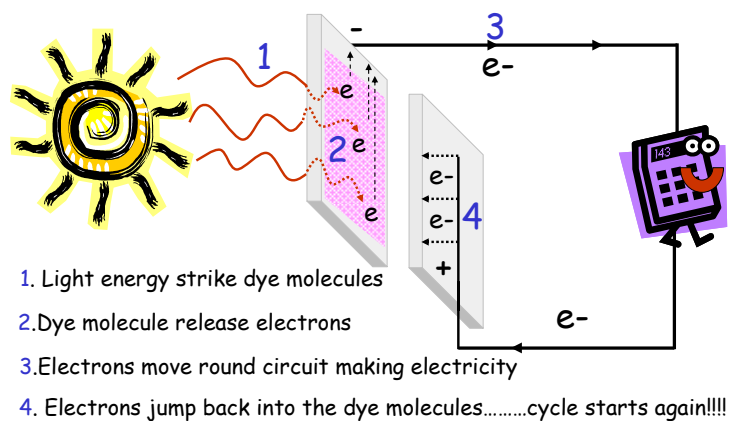
## An investigation to determine the most efficient dye for use Grätzel solar cells

### Introduction

Grätzel solar cells are devices that directly convert sunlight energy into electrical energy. They are commonly known as *dye sensitised solar cells*. This is because they use a dye for converting sunlight energy into electrical energy. The dye can be extracted from various ingredients, such as blackberries, hibiscus tea, onion skin, cherries and even ribena.



Below is a diagram of a Grätzel cell generating an electrical current (electricity) to power a calculator.



The diagram demonstrates that the dye molecules play a key role in generating electrons for an electrical current. The magnitude of the electrical current is very dependent on the dye used. In this experiment you will get to measure the electrical current of different dyes used in Grätzel cells.

**Aim:** To determine the best working dye for generating an electrical current

**Materials needed:** Grätzel solar cells (prepared from different organic dyes), voltmeter, light source (desk lamp), ruler

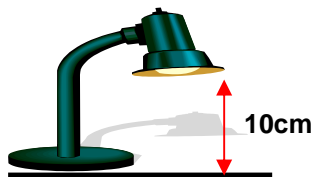
**Circuit Symbols:**



**Experimental:**

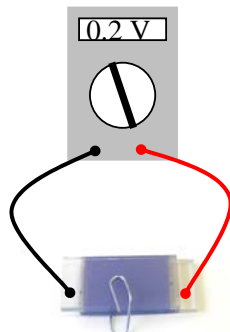
### 1. Setting up the light source (desk lamp)

- Point the head of the desk lamp onto the bench.
- Using a ruler measure the distance between the head and the bench top.
- Adjust the head so that there is a 10cm gap.



### 2. Making current output measurements

- Connect the Grätzel solar cell to an ammeter.



- Carefully, place the Grätzel solar cell under the light source.
- Switch on the desk lamp and measure the current output produced. Note down the current output measurement in the results table.
- Do the same for the other Grätzel solar cells

## Results

1. Table of results

Name of Dye	Current Output / V

2. Using the results above plot a bar graph.
3. Which dye produced the highest current? .....
4. What is the unit of current? .....
5. Compare your results with other students in the class. Did they get the same result as you.