

# Physics Workshop

## Efficiency of a Solar Cell

1. If it is a very sunny day you can try this experiment on a window ledge else position the Pyranometer under the anglepoise lamp and switch on.
2. Note the incident  $W/m^2$  on the Pyranometer's solar cell. Ensure that you keep the lamp at the same height throughout the rest of this experiment. You are now finished with the Pyranometer.
3. Measure the area of your solar cell in square metres then calculate the  $W/m^2$  that will be incident on your cell.
4. Place your solar cell under the lamp and at the same height as the solar cell on the pyranometer – this may take a bit of manipulating.
5. Connect the decade resistance to the cell output and set the load to 100R.
6. Connect a voltmeter and ammeter to monitor the output of the cell.
7. Increase the load in 50R steps for six readings then take another six readings in 100R steps. Note the Voltage and current at each step.
8. Knowing V & I now calculate the power at each step and draw a Power/Load graph.
9. Read the maximum power from your graph and now calculate the efficiency. Note that you have calculated the efficiency for a given illumination – do not assume that this remains constant for all illuminations.

### Apparatus Supplied

Solar Cell

Anglepoise Lamp

Pyranometer

Leads (S)

Volt Meter (S)

Ammeter (S)

Decade Resistance Unit

Graph Paper