Possible contexts: Key stage 3 – Energy topic

Apparatus

Solar cells, digital voltmeters, compasses, sunny day, protractors for extension work.

Investigation

Students will use their compass to point their solar panel towards north, south, east and west and record the values on their voltmeter.

Direction	Potential difference (V)
North	
South	
East	
West	

On returning to the class put the students' results into an excel spreadsheet and use the =average () function to work out the mean results.

Questions to ask students

1. Ask the students why their results might be different even though they were all doing the same activity.

   Errors in using the compass are likely to cause differences in their results.
   Are there clouds present? as they will affect the amount of light being received too.

2. What sort of graph should be used to show these results and why?

   A bar chart, as the data includes words and numbers or you can say that the direction is categoric data.

3. Which direction would be the best for positioning solar panels in school and why?

4. Would the results have been different if recorded at a different time of year? Why would that be?

Extension

Use an angle poise lamp as a model sun and a protractor to investigate how the angle of the solar cell affects the output potential difference.
What sort of graph would this data be displayed as?
Describe the trend that the results show.

Further information

For further information try the following links:
ed.ted.com/lessons/how-do-solar-panels-work-richard-komp
www.bbc.co.uk/news/science-environment-45132427