

G631: Electrons in Action – Sample Assignment C

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| Unit Name: Electrons in Action | Unit Number: G631 |
| Assignment Title: Scooters for a Shopping Centre | Assignment Number: G631 Sample Assignment C |
| Date Set: | Due Date: |
| Assessment Objective(s): AO2(a) | |

Assignment Brief:

A local council has decided to keep its city shopping centre for pedestrians only. The council realises that some form of transport will have to be provided for people with limited mobility. It has been decided to provide scooters. However the method of propulsion of the scooters has to be decided.

The method must be cost effective and damage the environment as little as possible with respect to:

- emissions
- resources used in manufacture (both energy and materials)
- disposal after use.

Assignment:

The council have asked a research assistant in the environmental department to find out as much as possible about the methods of propelling the scooters.

You are the research assistant. You have to prepare a report to present to the councillors of the environmental committee.

Tasks:

The following tasks will be involved in the preparation of the report:

Task 1:

Identify the possible methods by which the scooters could be powered.

(You need to identify 2 for MB1 or MB3 for MB2 and MB3).

Task 2:

For each method of propulsion:

- describe how the energy is produced and give the waste products
- include equations where appropriate
- include any risks when using each type of cell.

Describe the construction of the cells. Diagrams may be used.

- give advantages and disadvantages of using the cell.

Estimate the cost effectiveness of each cell by considering:

- the working life-time of the cell
- its ability to maintain a set voltage
- the cost involved in both acquiring and disposing of the cell (for MB3).

Task 3:

Compare the advantages and disadvantages of the cells chosen and recommend one type of cell for the scooter.

Record all the information found in the tasks with your recommendations in your report, which could be presented to the council.

[Max marks possible for this task: 8]

Resources:

- chemistry text books
- www.science.howstuffworks.com
- guidelines.