UCL Chemistry Sixth Form Event

Thursday 5th July 2012
Introduction

Who are we?
→ Eleven 2nd Year Eng. D and Ph. D students
→ Chemistry M3S Industrial Doctoral Centre (IDC)
Who was invited?
→ Seven Kings High School (Sixth Form), Ilford, Essex
→ 40 AS-Level Students, accompanied by a teacher
What we did?
→ Organised and implemented an “Open Day” for prospective students wanting to carry onto degree level at university, especially Chemistry at UCL.
→ Over approximately 6 months of planning and fortnightly meetings.
→ Assigned responsibilities to groups.
→ Liaised with school, food suppliers, UCL promotional and outreach services.

Why we did it?
→ **Showcasing the M3S IDC**
→ **Experience in pooling resources and organising major project to deadline**
→ **Promote Wonderful Chemistry**
→ **State of the art facilities offered by UCL**
→ **Potentially offer better suited degrees to prospective students**
Aims

→ Reach out to new prospective students thinking of continuing to further education

→ Feel of Science → Chemistry and Physics

→ Chemistry Magic Show
→ Physics Laboratory
→ Mass Spectrometer
→ London Centre for Nanotechnology
→ Ph. D & Eng. D Talks
→ Tour of UCL Campus

→ What is life like at UCL?
→ Is Chemistry at UCL difficult?
→ Is the 'jump' from A-level to Undergraduate level massive?
→ How do Undergraduates and Postgraduates differ?
→ What do Eng.D and Ph.D students do?
→ Academia – day to day life at university
→ Career prospects
## Itinerary

### TABLE 1

<table>
<thead>
<tr>
<th>TIME</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.15</td>
<td>Arrival</td>
</tr>
<tr>
<td>10.30</td>
<td>Welcome &amp; Introduction</td>
</tr>
<tr>
<td>11.00</td>
<td>Group Activity 1</td>
</tr>
<tr>
<td>11.45</td>
<td>Group Activity 2</td>
</tr>
<tr>
<td>12.30</td>
<td>Lunch</td>
</tr>
<tr>
<td>13.30</td>
<td>Group Activity 3</td>
</tr>
<tr>
<td>14.15</td>
<td>Group Activity 4</td>
</tr>
<tr>
<td>15.00</td>
<td>Group Activity 5</td>
</tr>
<tr>
<td>15.45</td>
<td>Farewell and Souvenirs</td>
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</tbody>
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### TABLE 2

<table>
<thead>
<tr>
<th>TIME</th>
<th>Group / Activity</th>
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<tbody>
<tr>
<td>11.00</td>
<td>A C E D B</td>
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<tr>
<td>11.45</td>
<td>B A C E D</td>
</tr>
<tr>
<td>12.30</td>
<td>LUNCH</td>
</tr>
<tr>
<td>13.30</td>
<td>D B A C E</td>
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<tr>
<td>14.15</td>
<td>E D B A C</td>
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<tr>
<td>15.00</td>
<td>C E D B A</td>
</tr>
</tbody>
</table>

### TABLE 3

<table>
<thead>
<tr>
<th>KEY</th>
<th>ACTIVITY</th>
<th>Room / Place</th>
<th>Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physics Demo</td>
<td>Physics Building</td>
<td>Syzmon / Isaac</td>
</tr>
<tr>
<td>2</td>
<td>Chemistry Magic Show</td>
<td>Turner Labs</td>
<td>Will / Nuru</td>
</tr>
<tr>
<td>3</td>
<td>Nano Technology</td>
<td>LCN</td>
<td>Nick / Jay</td>
</tr>
<tr>
<td>4</td>
<td>Mass Spectrometry</td>
<td>Mass Spec Lab</td>
<td>Richard / Marcus</td>
</tr>
<tr>
<td>5</td>
<td>PH. D Talks</td>
<td>Ramsay Lecture Theatre</td>
<td>Ralph / Liz / Atahil</td>
</tr>
</tbody>
</table>
Activity 1: Mass Spectrometry

- Brief history of Mass Spectrometry
- Overview:
  - Source – enables ionization
  - Analyser – accelerate + deflects ions
  - Detector – detects ions and relays info. to computer
Activity 1: Mass Spectrometry

- Electron Ionisation (EI) – sample bombarded with electrons -> generates radical
- Interpretating EI mass spectrum – peak identification
- Determining structure of unknown compound
Activity 2: Nanotechnology

- Students were given the opportunity to suit up and experience what it’s like to work in the London Centre for Nanotechnology’s 220sqm Class 1000 Cleanroom Laboratory Suite.
- Each tour experience lasted 20 minutes.
Activity 2: Nanotechnology

- Students learned about a range of nanoscale processing and characterisation equipment, including Scanning Electron Microscopes, Ellipsometers, Profilometers, Plasma Sputterers and Ion Beam Millers.
- Presentations were given on Plasma Processing, Photolithography and Electron Beam Lithography
Activity 3: Physics Experiments

- Diffractometry: Find wavelength of laser light knowing "grating" --> Steel Ruler
- Relate to x-ray diffractometry, with atoms as grating
Activity 3: Physics Experiments

• Particle accelerator --> Firing an electron gun, and varying magnetic & electrical fields to calculate --> charge/mass ratio of an electron.
• Build up knowledge of grating/wavelength using Balmer series (telescope experiment)
Activity 4: PhD Talks

- Advised them on how to choose which university to go to: research, visit and ask many questions.
- Enthused the students about postgraduate study by explaining our own experiences as Ph.D. students.
- Talked about how higher education is beneficial for finding a good career.
- Discussed the students' priorities for university.
Activity 4: PhD Talks

- Explored the pros and cons of studying abroad: different experience, may be cheaper but further from home and language issues.
- Encouraged the students to aim high with regards to the future.
- Answered their questions about higher education particularly the admissions process.
- Had fun.
Activity 5: Chemistry Magic Show

- We introduced the students to the layout of an undergraduate laboratory
- Basic principles of carrying out organic chemistry. Using round bottom flasks, sometimes in inert atmospheres.
- Schlenk lines, Rotary evaporators.
Activity 5: Chemistry Magic Show

- The Talk focussed on bubbles in day to day life. Beginning with the formation of bubbles on defects on the side of soda cans.
- A simple acid base reaction was demonstrated using vinegar and baking powder.
- Antibubbles were demonstrated.
- The talk finished displaying the most hydroscopic surface created in the world on which water bounces and rolls of.
UCL Campus Tour
Acknowledgements

Prof. Nora De Leeuw

Dr. Zhimei Du

Lisa Haigh → Mass Spectrometry Technician

Dr. Paul Bartlett → Physics Lab Co-ordinator

Derek Thomas → Physics Lab Technician

M3S IDC Team of 2009

Anna Roffey → Video Camera

Penny Carmicheal → Photographs