Concepts and Skills

- Use computers to analyze data
- Understand how computers work
CCMR Input:

- Graduate Student Presentations
- Facility Tours
- CCMR Resources
- References to Other CCMR Facilities and Projects
Lesson Plan: Day 1

Topic: Using Computers in Scientific Experimentation

Part 1: Emily Hackett Polymers Experiments

Concepts and Skills: Use computers to analyze data

CCMR Input:

• Graduate Student Presentation
• References to Other CCMR Facilities and Projects

Cornell Center for Materials Research

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Lesson Plan: Day 1, Part 1

Objective: ...use a spreadsheet to analyze data

Procedures:

• use molecular model kits to understand polymers
• explain/discuss the description, properties, and uses of thermoplastic polymers
• play thermoplastics polymer game
• do experimentation
• students will create a spreadsheet to find the sum and averages and analyze data

Evaluation: Standard Saturday Academy evaluation form
Lesson Plan: Day 1, Part 1

Plastic Bag Cuttings
Lesson Plan: Day 1, Part 1

### Grocery Bag Data Recording Sheet

<table>
<thead>
<tr>
<th></th>
<th>Vertical Strength</th>
<th>Horizontal Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strip 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strip 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strip 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strip 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average: Sum - 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference: Vertical Average - Horizontal Average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mystery Strength

<table>
<thead>
<tr>
<th>Mystery Strength</th>
<th>What direction was the mystery piece cut in? Circle your choice.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td>Horizontal</td>
</tr>
</tbody>
</table>
Lesson Plan: Day 1, Part 2

Objective: use a spreadsheet to graph data

Procedures:

• play elastomers polymer game
• do experimentation
• create a spreadsheet to graph data

Evaluation: Standard Saturday Academy evaluation form

<table>
<thead>
<tr>
<th>Mass</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>5</td>
</tr>
</tbody>
</table>
Lesson Plan: Day 2

Topic: Cornell Nanofabrications Facility Tour

Concepts and Skills: Understand how computers work

CCMR Input:

• Facility Tours

• References to Other CCMR Facilities and Projects
Lesson Plan: Day 2

Objective:

• understand how a computer chip is made
• understand how it functions to generate characters

Evaluation: Standard Saturday Academy evaluation form
Lesson Plan: Day 2

Procedures:

• explain concepts of how a computer works
• view small piece of wafer
• explain how computers interpret data
• show CNF video tour
• explain types of research taking place in the clean room
• explain/demonstrate bunny suits
• explain lithography
• do lithography food experiment
Lesson Plan: Day 3

Topic: Computer Build Project

Concepts and Skills: Understand how computers work

CCMR Input:

- CCMR Resources
- References to Other CCMR Facilities and Projects
Lesson Plan: Day 3

Objective: identify parts of a computer

Procedures:

• describe each part
• explain what the part is used for
• explain how to assemble the part
• students install the part

Evaluation: Standard Saturday Academy evaluation form
Lesson Plan: Day 4

Topic: Networking

Concepts and Skills: Understand how computers work

CCMR Input: CCMR Resources

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Lesson Plan: Day 4

Objective:

• describe the function of a computer network
• list the parts of a network
• network a computer

Procedures:

• describe each part
• explain what the part is used for
• explain how to assemble the part
• students install the part

Evaluation: Standard Saturday Academy evaluation form
Contributions

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