RET 2000 Final Project

Understanding and Using Computers

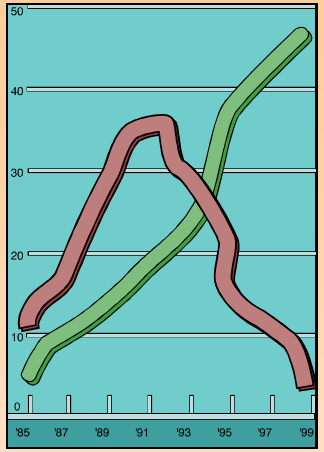
Valerie White

Saturday Math & Science Academy

Cornell Center for Materials Research

NSF

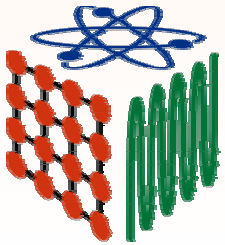
Concepts and Skills



- Use computers to analyze data
- Understand how computers work

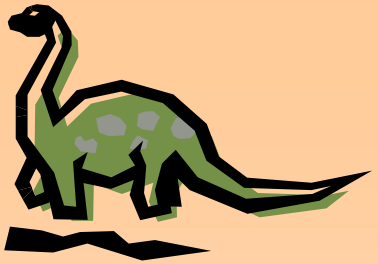
CCMR Input:

- Graduate Student Presentations
- Facility Tours
- CCMR Resources
- References to Other CCMR Facilities and Projects



Cornell Center for Materials Research

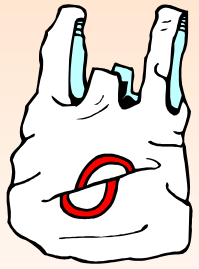
Lesson Plan: Day 1



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

Lesson Plan: Day 1, Part 1

Objective: ...use a spreadsheet to analyze data

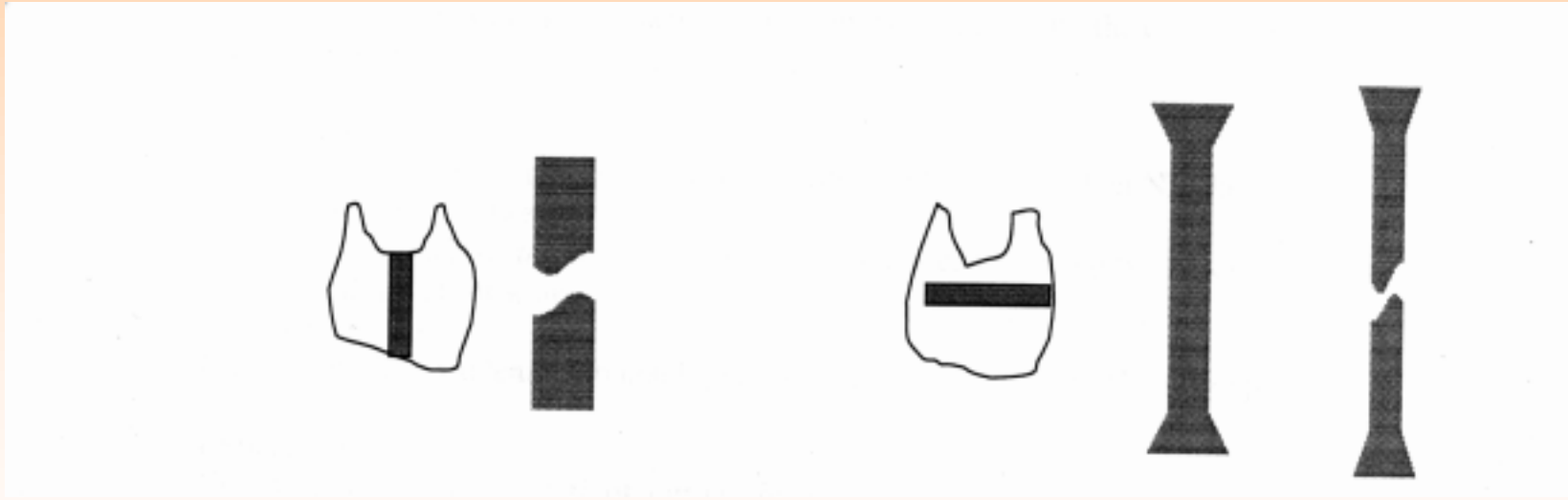
Procedures:

- •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



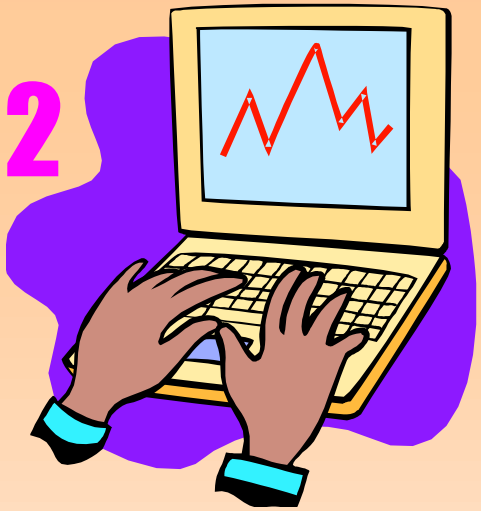
Lesson Plan: Day 1, Part 1

Grocery Bag
Data Recording Sheet

	Vertical Strength 	Horizontal Strength 
Strip 1		
Strip 2		
Strip 3		
Strip 4		
Strip 5		
Sum		
Average: Sum ÷ 5		
Difference: Vertical Average – Horizontal Average		

Mystery Strength	What direction was the mystery piece cut in? Circle your choice.	
	 **Vertical**	 **Horizontal**

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

Mass	Hours
23	1
40	5

Evaluation: Standard Saturday Academy evaluation form

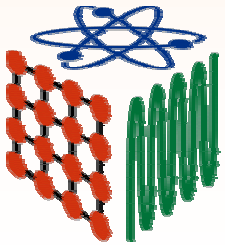
Lesson Plan: Day 2

Topic: Cornell Nanofabrications Facility Tour

Concepts and Skills: Understand how computers work

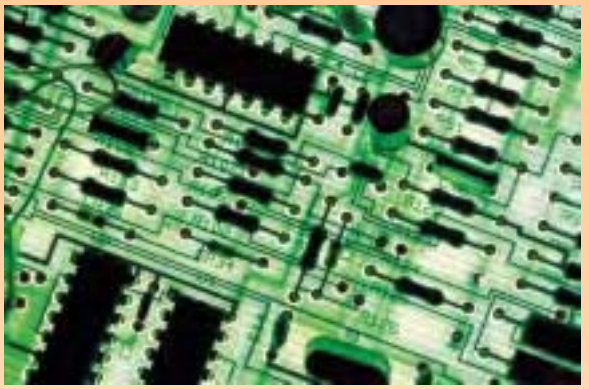
CCMR Input:

- Facility Tours
- References to Other CCMR Facilities and Projects



Cornell Center for Materials Research

Lesson Plan: Day 2

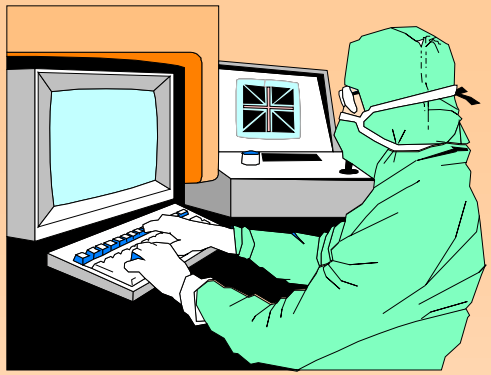


Objective:

- 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

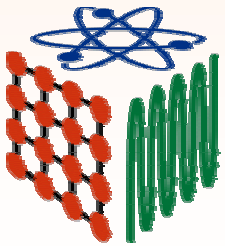
Lesson Plan: Day 3

Topic: Computer Build Project

Concepts and Skills: Understand how computers work

CCMR Input:

- CCMR Resources
- References to Other CCMR Facilities and Projects



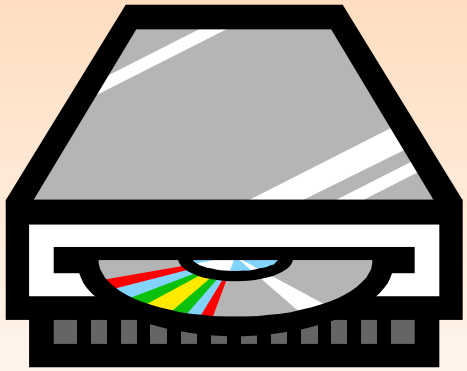
Cornell Center for Materials Research

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



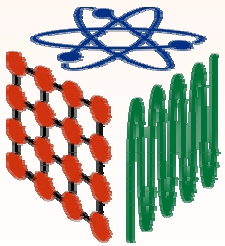
Evaluation: Standard Saturday Academy evaluation form

Lesson Plan: Day 4

Topic: Networking

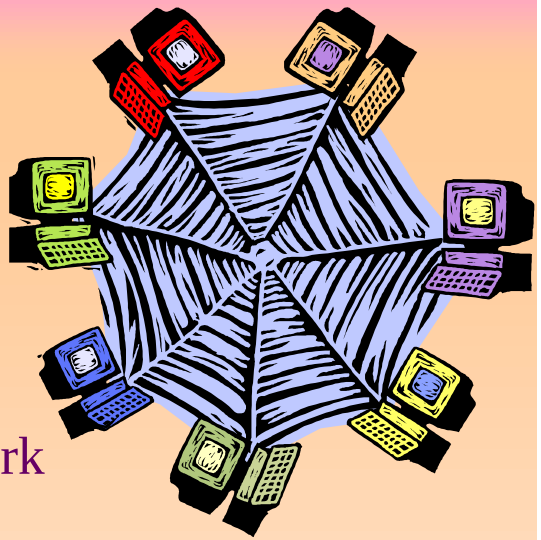
Concepts and Skills: Understand how computers work

CCMR Input: CCMR Resources



Cornell Center for Materials Research

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

Mike Skvarla, CNF

Emily Hacket, Graduate Student

John Hunt, Microscopy Facility

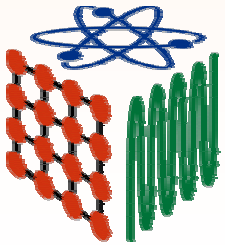
Jennifer Gaudioso

Nev Singhota, Outreach Coordinator

Sven Pedersen

Barry Robinson

CCMR and National Science Foundation



Cornell Center for Materials Research