NRC Study

- NSF asks "What should everyone know about information techology?"
- Computer Science and Telecommunications Board of NRC answers, "We'll study IT."
- Committee
  - Al Aho, Bell Labs
  - Marcia Linn, Berkeley
  - Arnold Packer, Johns Hopkins
  - Allen Tucker, Bowdoin College
  - Jeff Ullman, Stanford
  - Andy van Dam, Brown
  - Herb Lin, NRC Staff

Process ...

- Reviewed National Standards Efforts
- Solicited email comments from various constituencies
- Held meeting of 35 respondents
- Direct testimony from practitioners
- Days of meetings, megabytes of email
- Input from CSE chairs at Snowbird
- Draft report heavily reviewed

Committee's vector ...

- Propose exit conditions for college students
- Treat them as if they would become entry condtions one day
- Three componets
    - Concepts - digital encoding of information
    - Skills - sending email
    - Capabilities - debugging
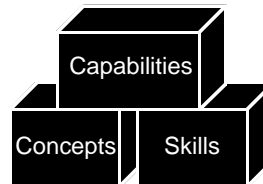
Candidate concepts deemed essential

- What's a computer, how does it work?
- Digital representation of information
- Algorithms, programs, programming
- Information Literacy -- know the need for/value of information
- Components of an information system
- Modeling phenomena with computers
- Protocols, networks and communication
- Universality of computers
- Limits to computation
- Social Issues -- privacy, encryption, etc.

Candidate skills deemed essential

- Using a PC environment
- Using a word processor
- Using a presentation tool
- Connecting a PC to information infrastructure
- Browsing and using internet resources
- Using email
- Using a spreadsheet
- Using an operating system
- Querying a database, processing data
- Using online tutorial information

Candidate capabilities deemed essential

- Engage in sustained reasoning in the design of a personally relevant project using technology.
- Manage complexity within a design project.
- Cope with unintended consequences.
- Test a design, engage in principled refinement.
- Debug a preliminary design.
- Locate information to complete a project and evaluate it.
- Collaborate with others using technology in a large project.
- Communicate the results of an IT project to others.
- Adapt to changing technology.
- Think of technology abstractly, learn by analogy, apply what you know to other contexts.