The Six Year Old Hacker:

No More Script Kiddies?

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A Need Born of Frustration.

- “So what did you do at school today”?
- The problem with computers, (computer based) instruction in elementary schools.
- Many schools have well considered “Technology Plans”.
- The absence of a plan usually means drill and kill.
A Need Born of Frustration.

- **The Good.**
  - Keyboarding
  - Research
  - Document production

- **The Bad.**
  - Drill and Kill
  - Edutainment
A Need Born of Frustration.

- The Ugly
  - MS Office skills
  - Research
  - Keyboarding
A Need Born of Frustration.

- The Environment
  - Labs
  - Locked Down and Hands Off

- After School
  - Uninformed caretakers.
  - Insufficient supervision.
  - Inappropriate use.
Other Models

- Going old-school on 'em.
- Self taught.
- The spirit of hacking: Doing science in a constructed world.
- Is the elementary school the right place for PCs?
"Any subject can be taught effectively in some intellectually honest form to any child at any stage of development."

-Jerome Bruner
The Plan

- Programing class
  - 6-11 year olds.
  - Computers aren't just for games, the Web, and boring adult stuff.
  - LOGO
  - The elements of problem solving.
  - Power tripping.
The Plan

- **Geek Dojo**
  - Open to all ages.
  - Self-selecting
  - Self-motivating
  - Sensie's Challenge.
  - H4x0ring!
  - Cryptography
  - Non-computer related geek stuff.
The Plan

- Summer school.
  - 5 and 6 year-olds.
  - 6-13 year olds.
  - Self-selecting.
  - 2 week, group projects.
The Plan

It's fun to have fun...
The Plan

... but you have to know how.

-The Cat in the Hat
Results

- What is a PROGRAM?
- Why do programing?
- No computers the first month.
- History of computing.
Results
Results

- **LOGO**
- **Turtle graphics.**
- **Begin with only relative motion commands.**
  - `fd steps == Forward some number of turtle steps.`
  - `rt deg == Right Turn some number of degrees.`
- *Try it first then write a program.*
to square
fd 100
rt 90
fd 100
rt 90
fd 100
rt 90
repeate 4 [fd 100 rt 90]
end

to poly :sides
repeat :sides [
  fd 100 rt 360/:sides
]
end

to poly :sides :size
repeat :sides [
  fd :size rt 360/:sides
]
end

to square
repeate 4 [fd 100 rt 90]
end
Results
Results
Results

From a basic Octahedral cell...
Results

...to a crystal. Or if you prefer...
Results
Results

Skill Acquisition vs. Age

- 6 years old: Basic Programming
- 7 years old: Variables/Substitution, Arguments, Recursion, Variables/Substitution
- 8 years old: 3 Space, Recursion, Useful Code
- 9 years old: Color Space
- 10 years old: Modeling and Simulation
- 11 years old: Useful Variable Names, Powers of 2/Binary Search
- 12 years old: Useful comments
Results

- Students take responsibility for their own learning.
- Learning becomes self-driven.
- Students become interested in the computing environment of the school.
  - Hardware maintenance.
  - Firewall construction.
Where Now?

This is all basic stuff. So why don’t we see more of it?

- How do we expand our reach?
- Public schools?
- Curriculum or no curriculum?
- Independent centers?
- Working with the learning disabled?
  - A real robot turtle.
  - Virtual Turtle in the real world.
- Working with younger hackers?
Props out...

- Diane Thompson, Amelia McCarthy
- Rod and Jane Connell
- Vince Szewczyk, David Kraus
- Maria Montessori, Jean Piaget, Seymour Pappert, Brian Harvey, George Mills