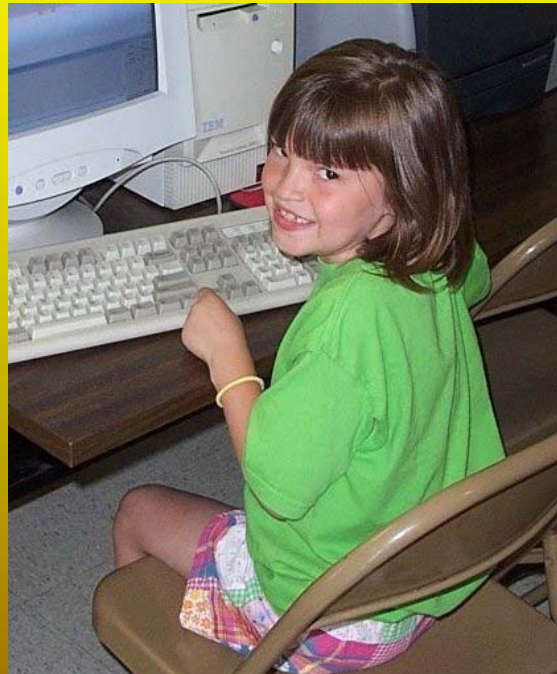


The Six Year Old Hacker:

No More Script Kiddies?



Kevin McCarthy

DefCon 13 30/Jul/2005



A Need Born of Frustration.

- “So what did you do at school today”?
- The problem with computers, (computer based) instruction in elementary schools.
- The Good, The Bad, The Ugly.
- 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?



The Plan

"Any subject can be taught effectively in some intellectually honest form to any child at any stage of development."

-Jerome Bruner



The Plan

- Programming 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

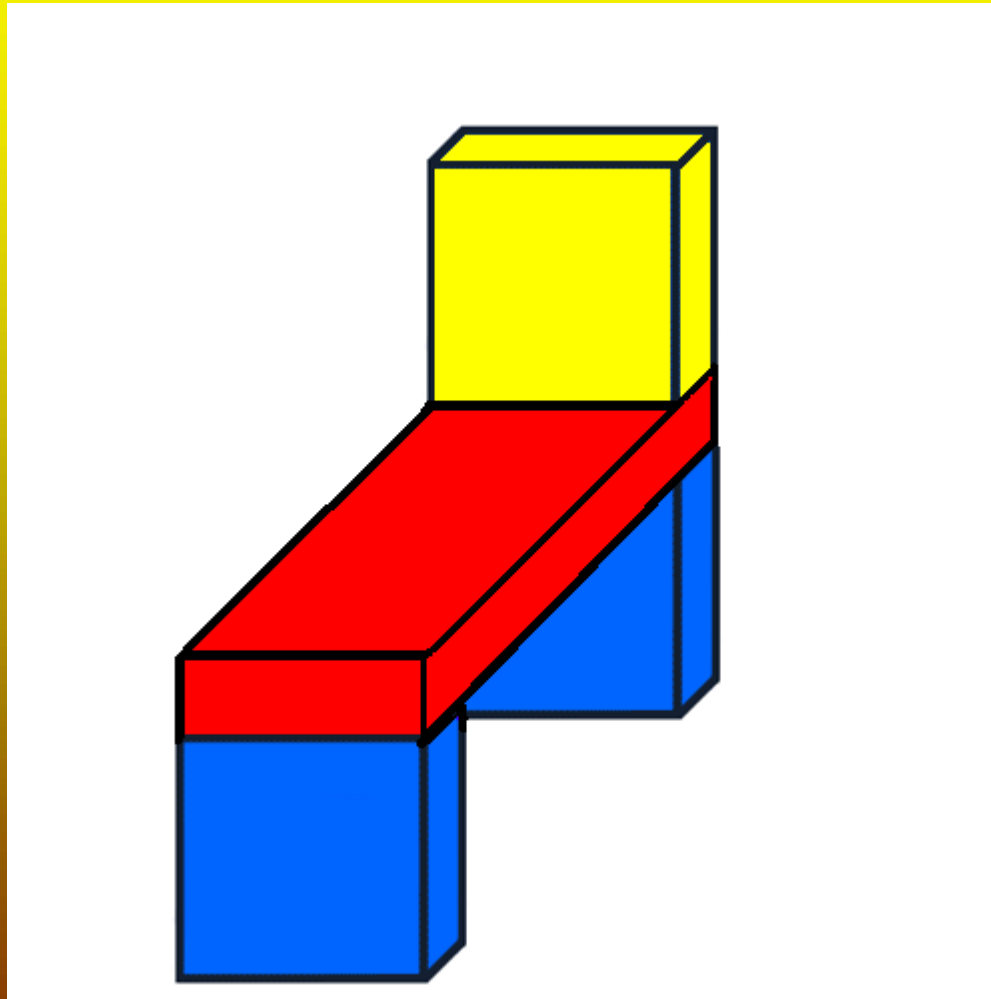


Results

- What is a PROGRAM?
- Why do programming?
- 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.*



Results

```
to square
```

```
fd 100
```

```
rt 90
```

```
fd 100
```

```
rt 90
```

```
fd 100
```

```
rt 90
```

```
fd 100
```

```
end
```

```
to square
```

```
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
```

```
]
```

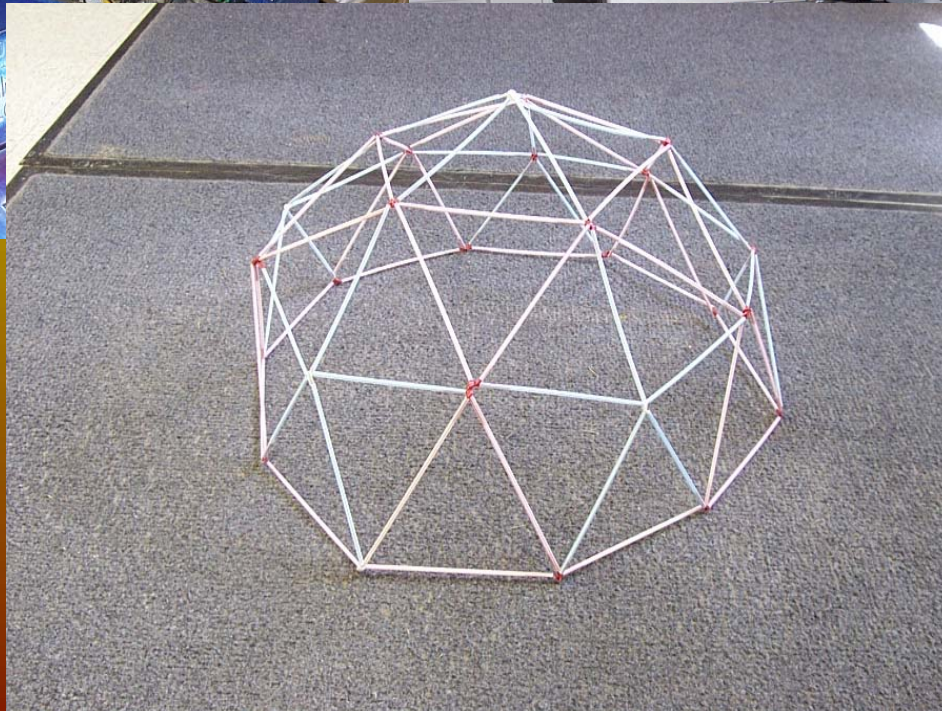
```
end
```



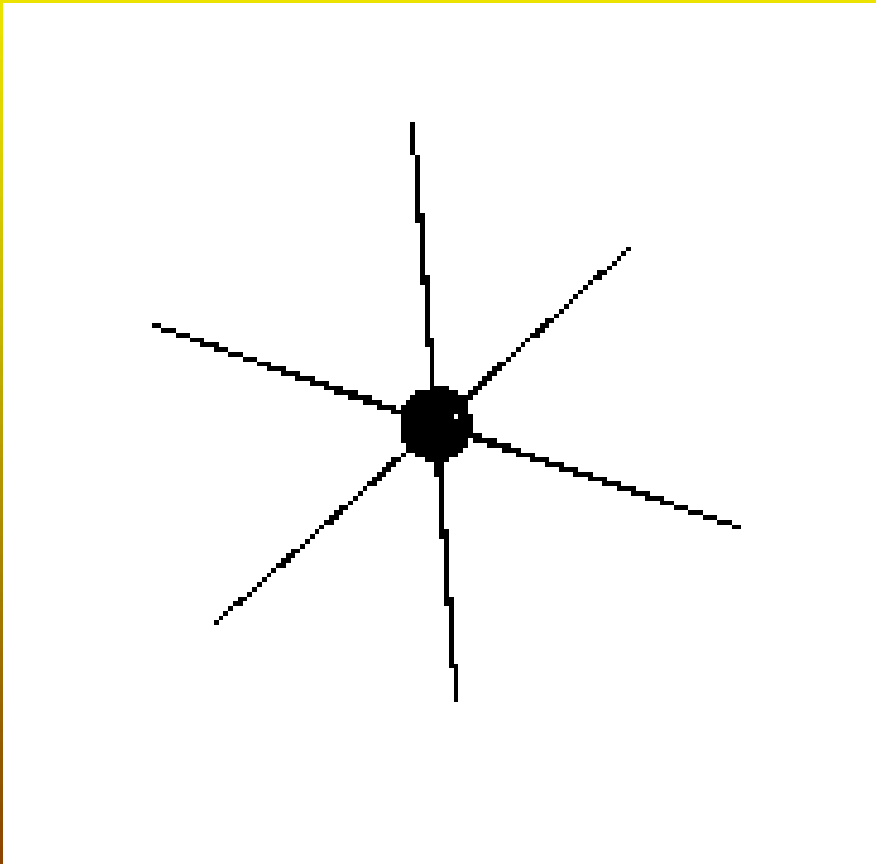
Results



Results



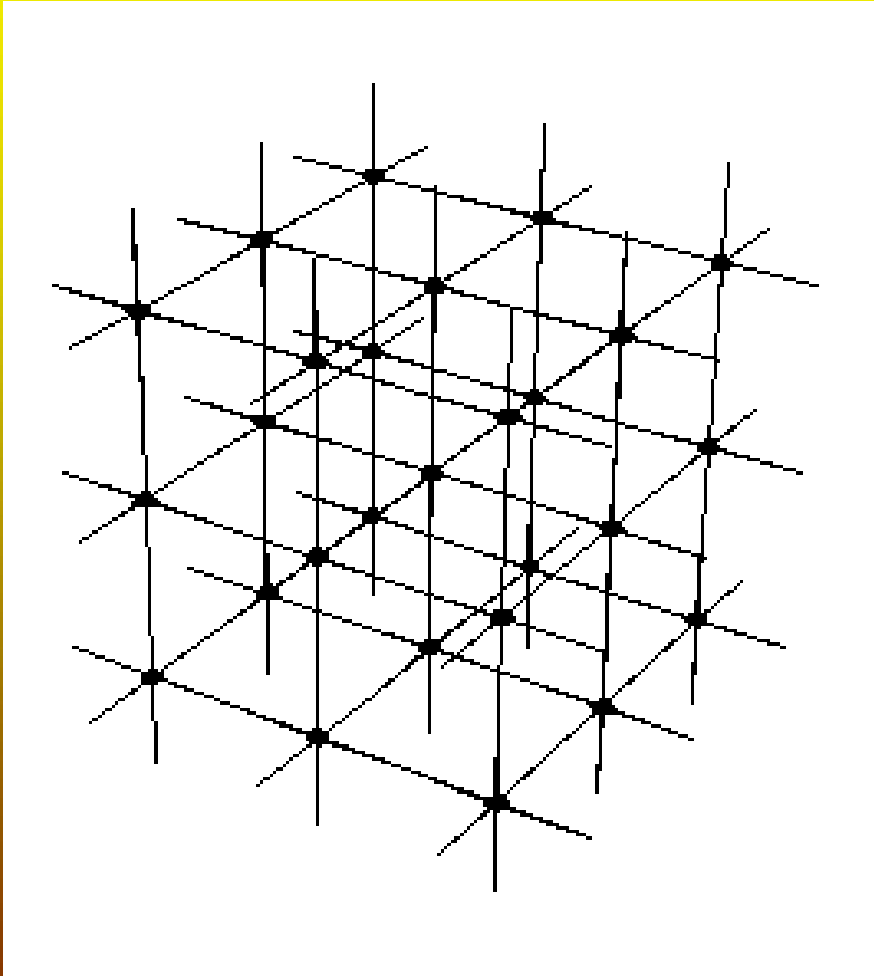
Results



From a basic
Octahedral cell...



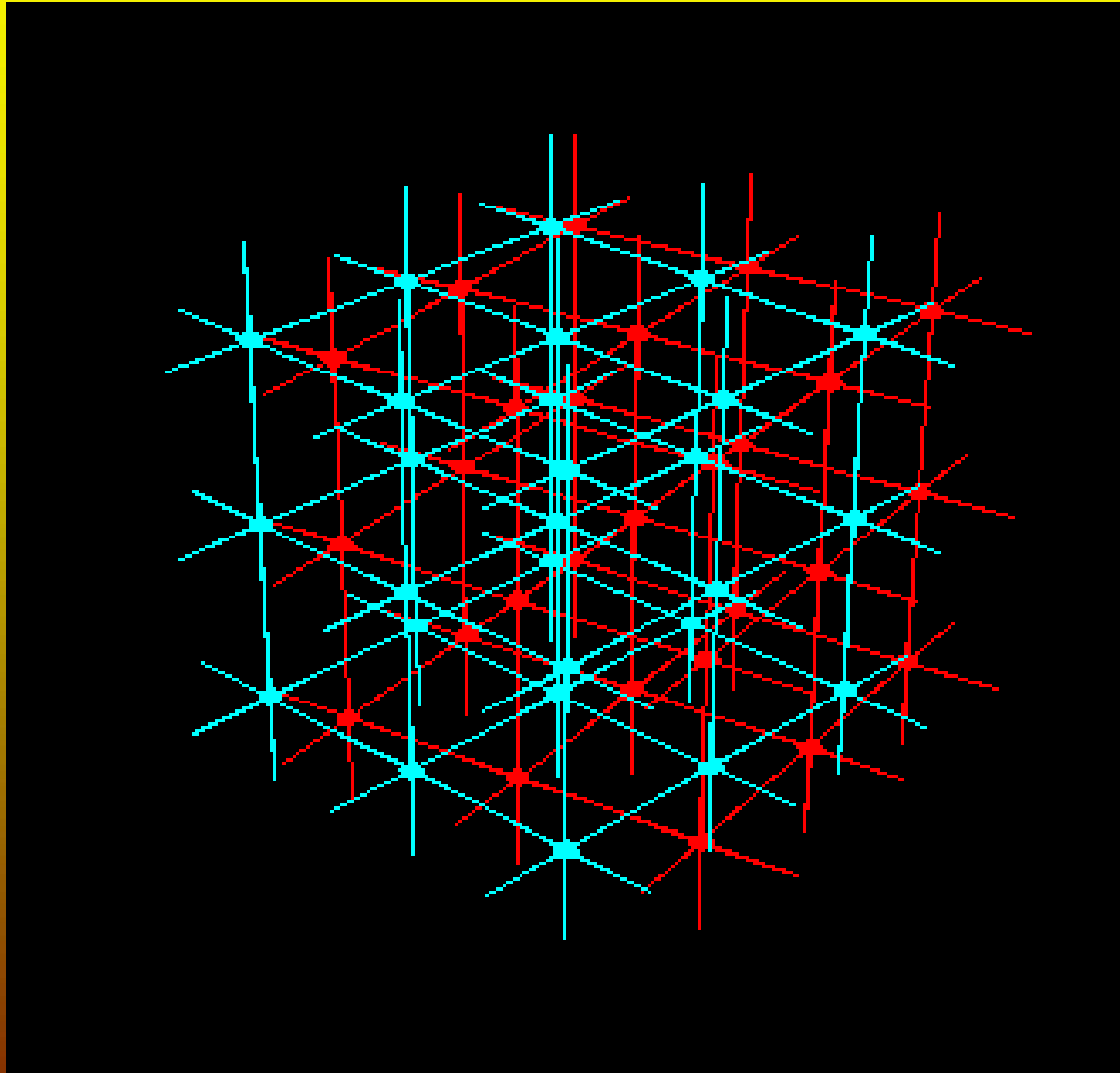
Results



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

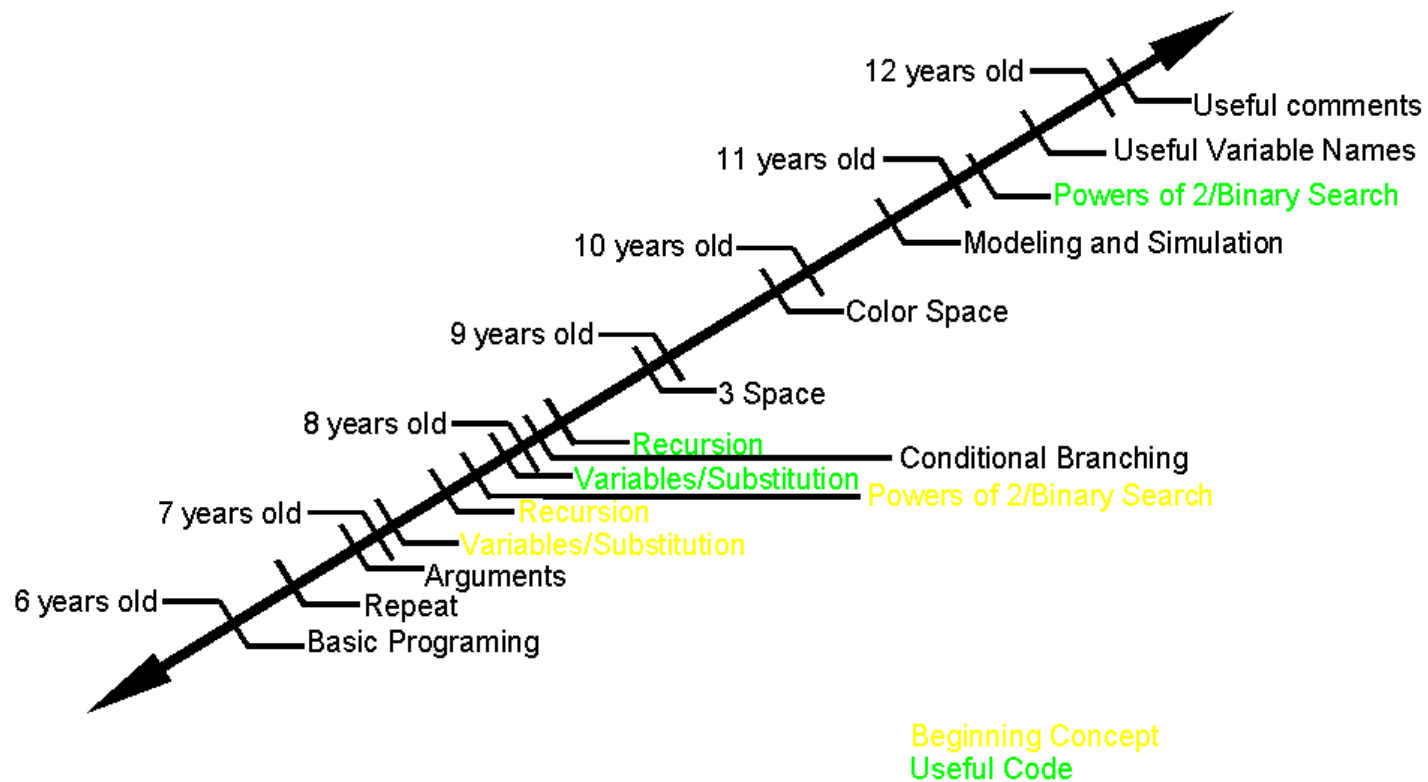


Results



Results

Skill Acquisition vs. Age



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

