Why Johnny Can't Program

Using toy robots to teach programming.

Doug Frevert
dfrevert@email.com
Follow a Line

Goal: program a robot to follow a line
The Line

- 2” solid black line on a white background
The Robot

- Two motors
  - Left
  - Right
  - Forward only
  - On/Off

- Light Sensor
  - Black or White
Elements of Programming

- Grammar
- Reading/Writing
- Arithmetic

- Language, Syntax
- I/O, RAM, Hard Disc
- CPU, Pentium, Processor
Sequence

- List
- Example:
  - Put on socks
  - Put on shoes
  - Tie shoelaces
  - Walk
Repeat

- Do it again

- Example:
  - Wake up
  - Tie Shoes
  - Go to Work
  - Repeat until the weekend
Decide

- Pick

- Example:
  Start with the left shoe
  Choose the brown socks
That's all there is.

- Simple ideas
- In use every day
- Liar!
Library

- Already written
- Don't re-invent the wheel

- Examples:
  - Motor Forward Forever
  - Motor Stop
  - Read Light Sensor
Review - Sequence

- Motor B or C
- Speed 50, 75, 100%
- Wait for 1 second
Review – Sequence 2

- C and B, Forward, 50% power, runs forever
Review – Sequence 3

- What do you expect?
Review - Switch

- Test a light sensor
- Creates 2 sequences
Review - Loop

- Infinite Loop
The pieces
Why was that difficult?

- How can a robot follow a line?
- Solve the problem, then write the program.