Scratch for Science
Computational Thinking

• Jeanette Wing, 2006
• Core theme in CS education, more and more in other subjects

• Abstraction
• Automation

• eScience Institute, SECANT, Matter & Interactions
Data Collection and Analysis

- Excel (Excelets, also mathematical models)
- Lab probes, software
- Commodity hardware (phones, Arduino) for data collection
Scratch for Science

• Limited need to teach the tool
  – Students pick it up faster than we do!
• Power of a versatile programming language
• Teacher-created resources
• Peer-created resources
• Assessments
• Simulations
Interactive Tutorials

- Similar to HyperCard stacks of the past
- More dynamic than PowerPoint
- Students can tweak, contribute
- Could take place of paper, poster
Learning Games

• Motivating for students
  – More likely to practice on own time
• Can be tailored to your classes' needs
• Students can take a part in shaping them
Modeling and Simulation

• "In these dynamic Turtle Microworl ds, [students] come to a different kind of understanding – a feel for why the world works as it does." – Seymour Papert, 1979
• Constructionism – learning through building and testing
• Explore unapproachable phenomena
• Can be made into games (motivation)
Students Creating Games

- They want to learn realistic physics
- The math can be very serious
- They show their friends
Potential for Data Collection, Analysis

- **PicoBoards**
- **Arduino**
- **Scratch 2.0**
- **Learning with Data project**, Lifelong Kindergarten


