Creative Programming with Scratch

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CS4HS 2012
Programming is...
Programming is...

- Empowering
- Creative
- Rewarding
- Fun

- "Telling a computer what to do"
Explore the creek by clicking the mouse on different objects!
The continual use of abstract thinking in programming can guide and discipline one’s approach to problems in a way that has value well beyond the information technology-programming setting. In essence, programming becomes a laboratory for discussing and developing valuable life skills, as well as one element of the foundation for learning about other subjects.

National Research Council

Being Fluent with Information Technology
Lightbot
Scratch: visual programming

- [http://scratch.mit.edu](http://scratch.mit.edu)
Why Scratch?

- No syntax learning-curve
- Build intuitions about computing concepts relevant to most languages
- Immediate feedback
- Great social networking component
- It’s good enough for [Harvard](http://www.harvard.edu) and [Berkeley](http://www.berkeley.edu)
Scripts

- Formalized algorithms
- Combination of blocks
- Attached to sprites or the stage
- Blocks only fit where syntactically correct
Warning!

• Major concepts are missing - abstraction
  – See Snap (what Berkeley uses)
  – Scratch 2.0 will come out really soon

• Easy to slip into entirely unstructured play
  – Repetitive code
  – Lack of transfer
Rubric: Resizable polygon

• ___/2 – has a size variable
• ___/2 – has a sides variable
• ___/2 – changing variables has desired effect
• ___/1 – has a creative background
• ___/2 – variable sliders on stage for user to set
• ___/1 – clicking on green flag starts program
Writing: proposal

- Students write formal project proposals
- Teach technical writing
- Bring in industry guest to hear elevator pitches
Design: storyboarding
Extensions

- http://byob.berkeley.edu/
- http://scratchabledevices.com/
- http://arduino.cc/playground/Interfacing/Scratch
- http://chirp.scratchr.org/
Parting words

• Encourage students to be tech producers
• Allow “guided play”
• Teach meaningful critical thinking skills
• “Hide” important lessons in a playful environment
• Leverage existing materials