Using App Inventor to Deliver Computing Science in Scottish Schools

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RSE/BCS Computing Science exemplification project aims

• Support teachers delivering new curriculum
• Create materials that are widely applicable
• Establish Computing Science - and Computational Thinking - in schools
Exemplification (Phase 1: 3 packs)

1. Introduction to Computer Science
2. Intermediate Computer Science
3. Mobile App Development

Bringing it all together: consolidate previous work through the medium of mobile app development.
Why mobile app development?

• Captures students’ imagination
  o Can also be gender-neutral
  o Presents lots of inter-disciplinary potential

• Lends itself to extended project
  o Open-ended, flexible & creative
  o Transferable skills

• It’s current and real-world!
  o Kids are using these things every day
  o Ability to create own app – and even market it – is a strong motivator
Why App Inventor?

• Accessible
• Powerful
• Creative
• Logical progression from Scratch
• Free (don’t even need handsets)

• Puts the Wow! back into CS classes
I ♥ My Smartphone: A Computing Science Course in Mobile App Development

http://www.royalsoced.org.uk/1035_MobileAppDevelopment.html
Curriculum Plan (Learner materials)

• **Introduction & investigations**
  - History of the smartphone
  - Smartphone software: OS & Apps

• **7 example apps for students to create with additional:**
  - Screencasts
  - Box-outs to highlight key ideas
  - Core tasks + extension exercises
  - “Did you understand?” exercises

• Apps become more complex, introduce new concepts

• Group project
Curriculum Plan (Teacher materials)

- Background and pedagogy
- Setup and other issues
- Suggested approaches
- Lesson materials including
  - screencasts, sample apps and media files
  - sample solutions & student tracking
- Mapping to new Scottish curriculum...
  ...but a **flexible** resource that any teacher can follow and adapt to local circumstances
Example App: Finger Paint

![Finger Paint App](image-url)

- **ButtonBlue.Click**
  - set `DrawingCanvas.PaintColor` to `Blue`

- **ButtonGreen.Click**
  - set `DrawingCanvas.PaintColor` to `Green`

- **ButtonRed.Click**
  - set `DrawingCanvas.PaintColor` to `Red`

- **DrawingCanvas.Touched**
  - `x` name
  - `y` name
  - `touchedSprite` name
  - call `DrawingCanvas.DrawCircle`
    - `x` value
    - `y` value
    - `r` number 10
Example “Did you understand?” task

A user starts up a FingerPaint app and immediately clicks ButtonBigBrush (code shown below).

However, when the user tries to paint, nothing appears on the canvas until they click ButtonBigBrush a second time.

Discuss with your partner why this happens and what change(s) should be made to the code to fix this bug.

Reason __________________________________________________________
Example App: Wiff-Waff
Example “Did you understand?” task

**Algorithm**

Moving bat (using Orientation Sensor)

if orientation sensor roll > 0 then *(phone is tilted to the right)*

- set the bat heading to the right (0)

else *(phone is tilted to the left)*

- set the bat heading to the left (180)

7.3 In what direction will the bat move if the phone’s tilt is zero (completely level)?

_________________________________________________________________________________

Why?

_________________________________________________________________________________
Group project

Students work in a pair or group to create their own mobile app. They go through the main stages in the SD process:

1. Analyse
2. Design
3. Implement
4. Test
5. Document
6. Evaluate
7. Maintain

Or... *A Dance In The Dark Every Midnight!*
Experience of pilot schools

• Setup work is important and necessary

• Works best with phones as well as the emulator
  o Although course can be completed without handsets

• High level of student engagement

• Screencasts are good for providing further individual support or for absent students

• The mixture of activities helps to deepen students’ understanding of Computing Science
App Inventor = getting CS right in schools

• Ideal progression from environments like Scratch
• Fully engages the students
• Scope for rich inter-disciplinary work

• Will get students wanting to take your courses!
Why is this important?

• **Create a population**
  o of problem solvers;
  o that understands computers and digital society;
  o that has the skills required to become a flexible, adaptable workforce.

• **Because if we don’t…**

Questions?