Using App Inventor to Deliver Computing Science in Scottish Schools

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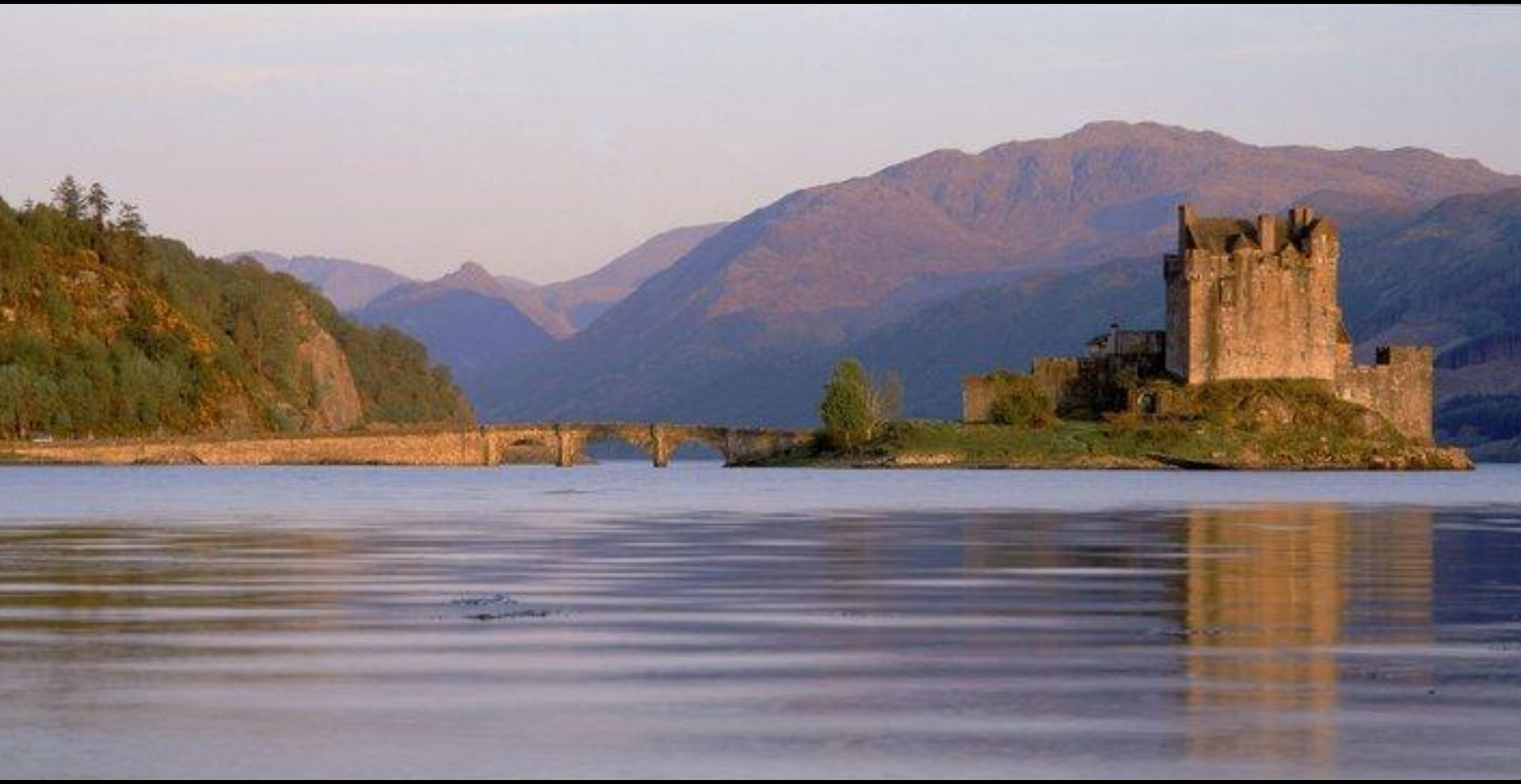
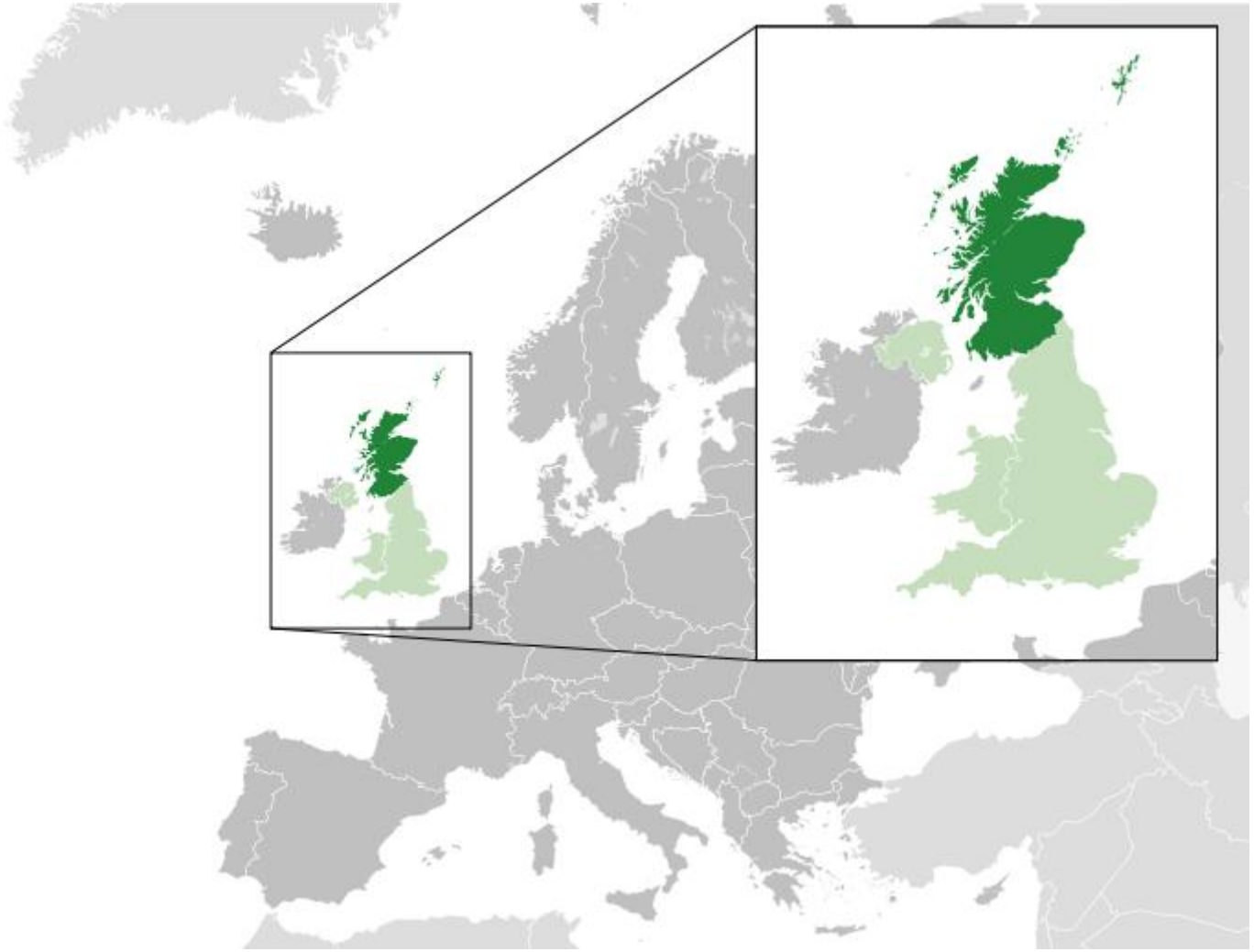
Disney · PIXAR
BRAVE
CHANGE YOUR FATE. JUNE 22




81


Glenfiddich
SINGLE MALT
SCOTCH WHISKY
DISTILLED, MATURED AND BOTTLED
THE VALLEY OF THE DEER
where the distillery has stood
SINCE 1887
15

Scotland



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

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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**
  - **Can** also be gender-neutral
  - Presents lots of inter-disciplinary potential
- **Lends itself to extended project**
  - Open-ended, flexible & creative
  - Transferable skills
- **It's current and real-world!**
  - Kids are using these things every day
  - 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)

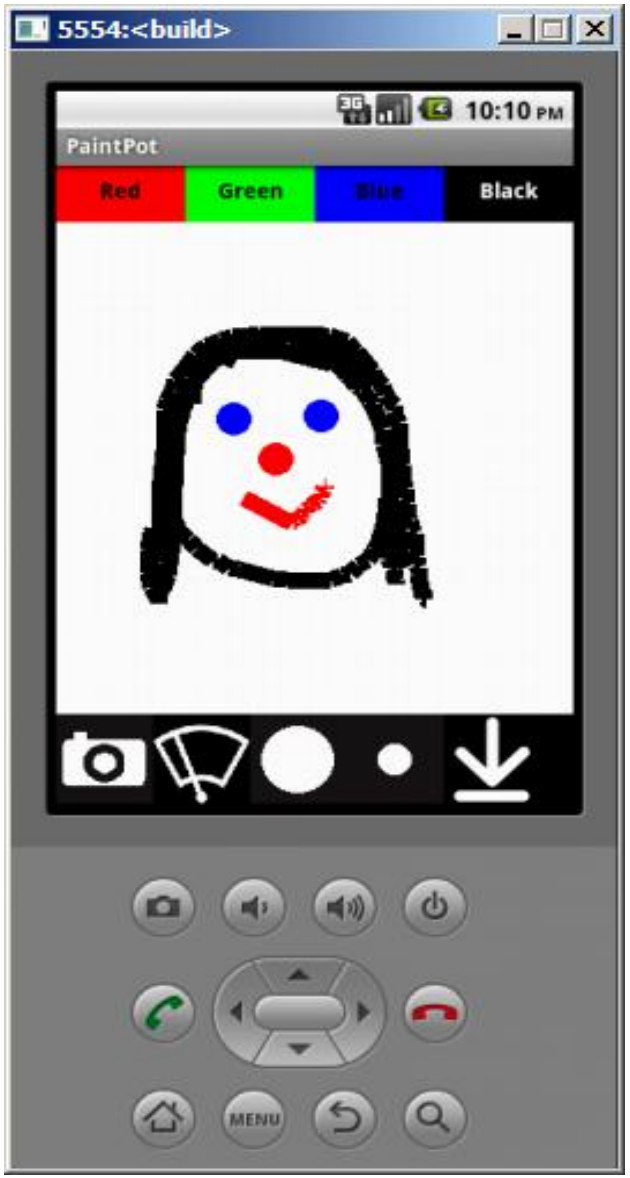
- **Introduction & investigations**
  - History of the smartphone
  - Smartphone software: OS & Apps
- **7 example apps for students to create with additional:**
  - Screencasts 
  - Box-outs to highlight key ideas 
  - Core tasks + extension exercises
  - “Did you understand?” exercises 
- **Apps become more complex, introduce new concepts**
- **Group project**

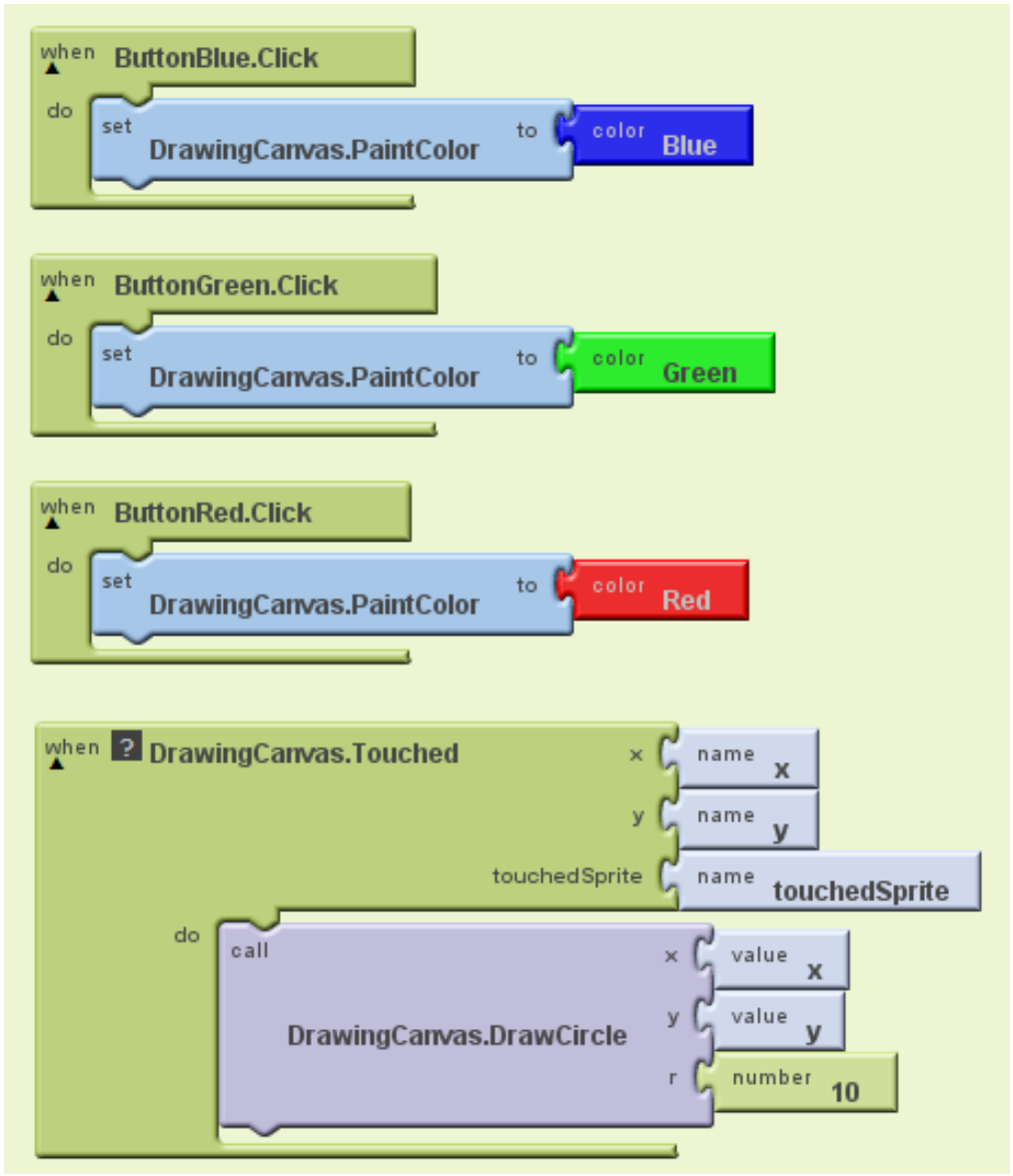
Curriculum Plan (Teacher materials)

- **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

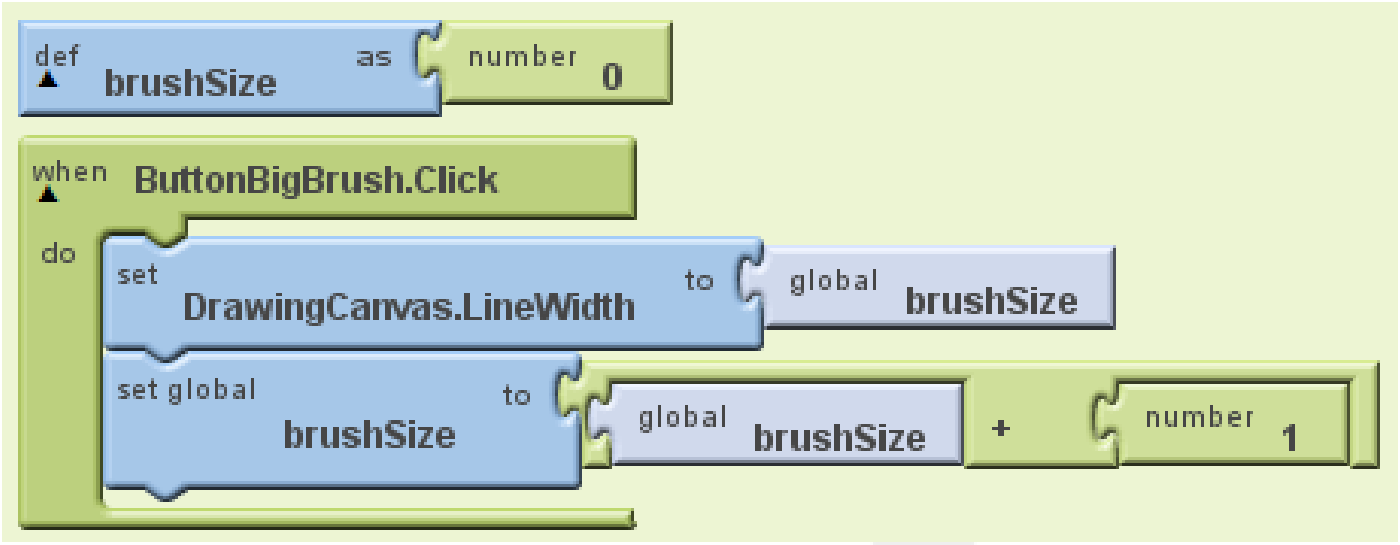
Example App: Finger Paint





Example “Did you understand?” task

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

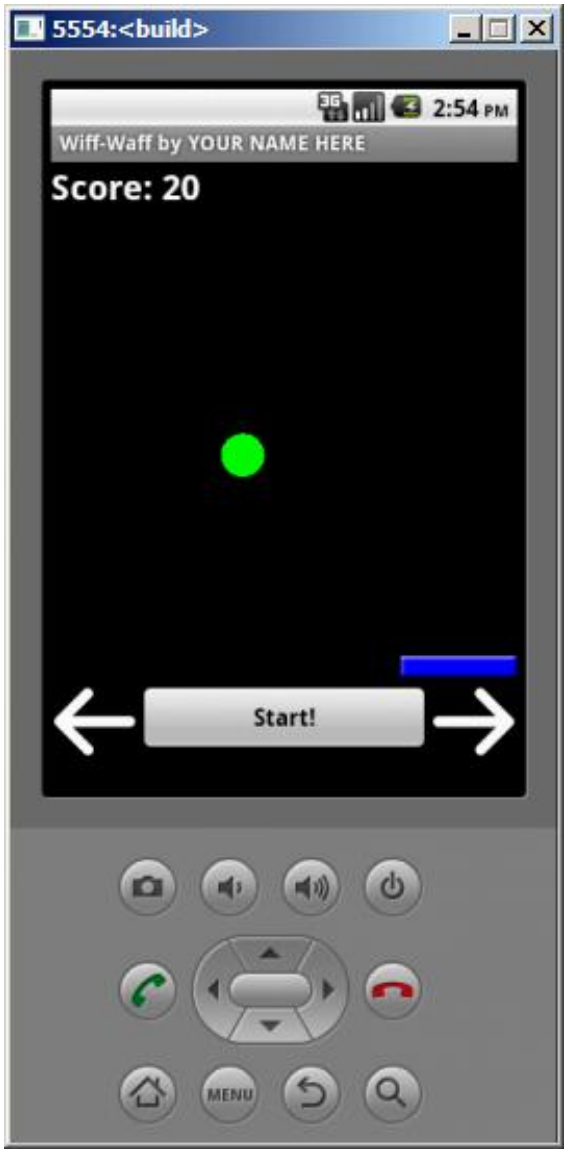


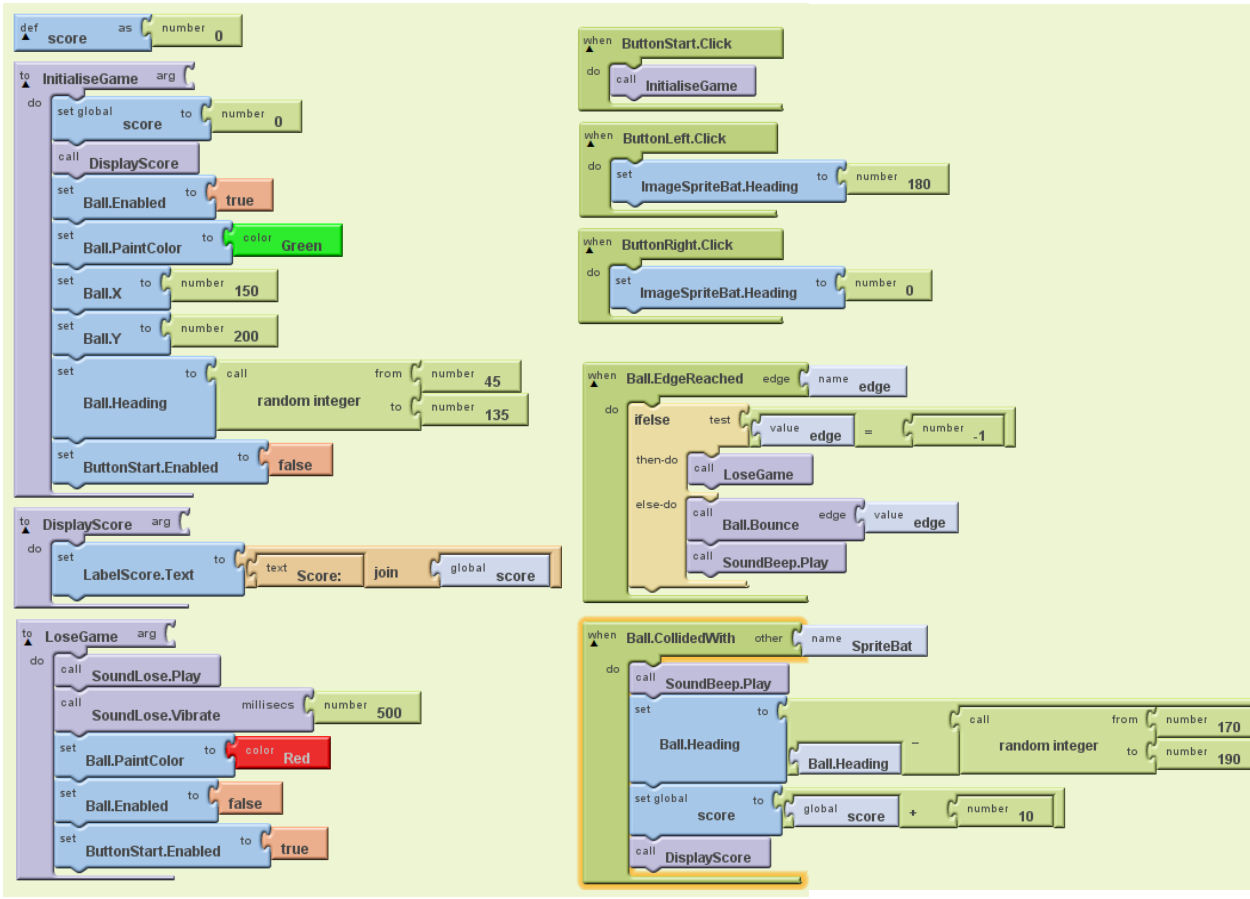
However, when the user tries to paint, nothing appears on the canvas until they click **ButtonBigBrush** a **second** time.

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**
  - 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**
  - of problem solvers;
  - that understands computers and digital society;
  - that has the skills required to become a flexible, adaptable workforce.
- **Because if we don't…**

Questions?