TouchDevelop Challenge - Scheme of Work

Timing

This unit is expected to take fourteen lessons (based on 50 minutes lessons)
Note: This unit and the teaching hours are suggestions only. It is expected that you will alter the timings and sequence of each lesson to suit your needs.

Resources

- TouchDevelop Web App (www.touchdevelop.com)
- TouchDevelop Challenge lesson resources (www.touchdevelop.weebly.com)

Background

What is TouchDevelop?

TouchDevelop is an online app creation tool from Microsoft Research. Originally designed to develop Windows Phone 7 apps, the TouchDevelop Web App now allows you to develop Windows Store apps suitable for Windows 8 touch screen devices and runs on iPad, iPhone, Android, PC, Mac, Linux. There is also a dedicated TouchDevelop app on the Windows Phone 8.

Assessment

How students will be assessed:

- Research on existing mobile phone apps
- App proposal form (Functional Specification)
- Design documentation (Pseudo code / Storyboard)
- App coded in Touch Develop (With comments)
- Test plan (with results)
- Evaluation

Lesson Outlines

Lesson 1: Introduction to TouchDevelop: Turtle Challenge

Learning Objectives:

- Understand and use sequence in an algorithm
- Understand and use iteration in an algorithm (FOR, WHILE and FOREACH loops)

In this gentle introduction to TouchDevelop, students will learn some basic code using the built-in turtle function.

Lesson 2: Introduction to TouchDevelop: My first script

Learning Objectives:

- Understand and use sequence in an algorithm
- Understand the purpose of variables
- Use variables
- Understand and use iteration in an algorithm (FOR, WHILE and FOREACH loops)

In this lesson, students will write their very first script - a simple guessing game.

Lesson 3: Comments and list

Learning Objectives:

- Understand the purpose of a list
- Create and call a list
- Understand the purpose of comments in code

In this lesson, students will learn why it is important to add comments to their code.

Lesson 4: My first game - Part 1

Learning Objectives:

- Know the difference between local and global variables
- Use variables
- Know how to control sprites in TouchDevelop
- Know how to sense events in TouchDevelop
- Understand the importance of sound in games

In this lesson, students will create their very first game.

Lesson 5: My first game - Part 2

Learning Objectives:

- Know how to keep score in TouchDevelop
- Know how to create a leaderboard.

In this lesson, students will improve the functionality of their game from the previous lesson by adding lives and a scoreboard.

Lesson 6: Using libraries

Learning Objectives:

- Understand and use libraries in TouchDevelop

In this lesson, students will learn how to create a game using the game library.

Lesson 7: My first app

Learning Objectives:

- Know how to create a game board for a mobile phone app.
- Understand and use iteration in an algorithm (FOR, WHILE and FOREACH loops)

In this lesson, students will create a mobile app to simulate the rolling of a dice.

Lesson 8: Functional Specification

Learning Objectives:

- Understand the importance of the functional specification.
- Examine the specification details required for an app.

In this lesson, students will produce a functional specification that describes the context, purpose and audience for their app. Students will need to describe their app in detail explain how they will measure the success of their app.

Lesson 9: Design

Learning Objectives:

- Understand the process of app design
- Consider the importance of good design
- Understand algorithms written in pseudocode or flow diagram
- Produce algorithms in pseudocode or flow diagrams to solve problems

In this lesson, students are required to produce a design for their app that meets the functional requirements. It needs to include different multimedia components, some ready made and some made by the student. Students will also need evidence of prototyping their solutions, which have been evaluated and improved on.

Lesson 10 to 12: Develop an app (Coding)

Learning Objectives:

- Create an app to meet a design brief

Students need to publish a fully working game/app with instructions for the user. Students code should contain the following:

- o Variables (local and global)
- o Iteration (for, while or foreach loops)
- o If statements
- o Comments
- o Functions (actions)

Lesson 13: Testing

Learning Objectives:

- Understand the importance of testing
- Explore strategies for testing
- Understand and identify syntax and logic errors
- Select and justify test data for a program, stating the expected outcome of each test

Students need to produce evidence of testing their game/app, both formative and summative.

Lesson 14: Evaluation

Learning Objectives:

- Understand what makes an app successful
- Examine the success of an app

Students need to produce an evaluation that measures the success of their app. The key question to answer is how well the solution meets the requirements. Students must also identify areas for improvement. When evaluating their game/app, students should consider the following:

- o Does the app function correctly?
- o Is the app fit for purpose?
- o Is the app suitable for the target audience?
- o Did you encounter any problems and, if so, how did you overcome them?

Curriculum Map – KS3

This section is designed to help you map some of the requirements of the new computing programmes of study in England.

Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem.	Lesson 9 – Introduction to algorithms – (Making the tea) In this lesson, students will understand algorithms written in pseudocode or as a flow diagram. Students will also write an algorithm (using pseudo code or flow diagram) to solve a problem.
Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions.	Lesson 1 to 7 – TouchDevelop tutorials – In this sequence of lessons, students will learn how to code simple games and apps using TouchDevelop. Students will also learn how to create procedures or functions (actions) using TouchDevelop.
Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits	Lesson 2 to 7 – TouchDevelop tutorials – In TouchDevelop, the datatypes of variables are inferred through analysis of the code however, it is important for students to understand the different datatypes. Different datatypes are discussed in each of the tutorials however, it is recommended that the students explore the use of datatypes in more detail.
Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users	Lesson 8 – Functional Specification – In this lesson, students will produce a functional specification that describes the context, purpose and audience for their app. Students will need to describe their app in detail explain how they will measure the success of their app. Lesson 10 – Testing - Students need to produce evidence of testing their game/app, both formative and summative. Students will need to create detailed test plans to ensure that the their game/app works correctly and meets the requirements of the functional specification. Lesson 14 – Evaluation - Students need to produce an evaluation that measures the success of their app. The key question to answer is how well the solution meets the requirements. Students must also identify areas for improvement.

Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability	Lesson 2 to 12 – TouchDevelop tutorials – When creating their apps, students can re-use a variety of digital artefacts (images and sound). Students also explore the use of sprite sets to re-use digital artefacts (sprites) and perform operations over multiple sprites at once. Lessons 8, 9, 13 & 14 – Students are required to design, test and evaluate their game / app. When choosing artefacts for their game / app, students should consider usability and suitability for the target audience.
Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.	Students should be made aware of legal and ethical issues such as copyright. Explain to students that, if they wish to publish their app to the Windows Store, they must ensure that any sound, images etc. are entirely their own work or that they have permission from the owner / original author. You can also use this as an opportunity to re-enforce key eSafety issues for example, explaining that anything that the students upload to touchdevelop e.g. images, sound etc. will remain there forever and reminding students about thinking before they post etc.