Computing Science Concepts

-Unified start
-Sequence
-Some sequences have a definite order
-There is more than one way to accomplish the same goal
-Screen output in pictures and text

National Curriculum Programs of Study

Pupils should be taught to:

design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; **solve problems by decomposing them into smaller parts**

use sequence, selection, and repetition in programs; work with variables and **various forms of input and output**

use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Research Focus

This planning uses a **completion problem** where some of the code is provided but pupils need to complete it. This one has a twist as they are provided with the idea and algorithm to help them complete the programs.

Computer scientists have **four levels** of construction. The ideas level, Planning level (which includes the algorithm), code level, and execution level (testing the code)

Stage, Sound & Movement Planning Version A [Completion problem]

Overview

1. Introduce the challenge of adding movement, sound and different backgrounds to an existing monologue or dialogue
2. Pupils examine an example idea and algorithm in detail
3. Pupils complete the partially finished code that goes with the example idea and algorithm [completion problem] ⇔
4. Pupils plan their own stage directions, music & background changes to go with a previously designed and created monologue or dialogue
5. Pupils code their stage directions, music & background changes
6. Pupils test their creations
7. Peer assessment of projects
8. Refinement of projects responding to peer assessment

1. Introduce the challenge of adding movement, sound and different backgrounds to an existing monologue or dialogue

Remind pupils of the monologues or dialogues that they created previously. Ask them what would improve the program? Backgrounds, sound, movement etc.

2. Pupils examine an example idea and algorithm in detail

Give pupils either the bat example extended planning or the Churchill example extended planning. Can they spot what was the original planning and what ideas have been added? Scene changes, costume changes, direction facings and wait periods from the start.

New algorithmic ideas are all on the left hand side.

3. Pupils complete the partially finished code that goes with the example idea and algorithm [completion problem]

Pupils load either the **bat example stage sound Scratch file A** or the **Church-ill example stage sound Scratch file A**. They can use their extended planning example to help them complete the program. All the code is in the right sprites or stage and code which is already connected is in the right place but code for the extras is not connected or slotted it yet.

If pupils get stuck refer them back to the plan or a specific part of the plan.

Once complete or after pupils have made a credible attempt

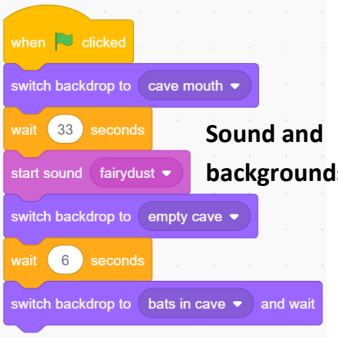
Once most have finished, show them the completed original how close was their work?

Feedback

As you go through the stage area did they get the stage backgrounds and sound in the right order? In the sprites did they get the facings and costume changes correct? Also point out that they could have also had sound and background changes in the sprites instead of the stage area.

Files

BatSScompleteScratch S2
BatSSincompleteScratch S2
BatSScompleteScratch S3
BatSSincompleteScratch S3
ChurchillSScompleteScratch S2
ChurchillSSincompleteScratch S2
ChurchillSScompleteScratch S3
ChurchillSSincompleteScratch S3



Sound and backgrounds

A3 Dialogue planner extended

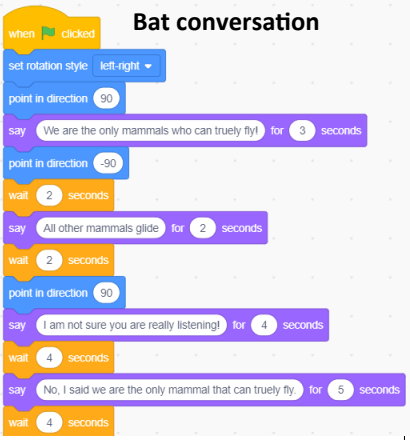
Name	Class	Idea
		A conversation between a bat and a human where a few facts about bats are shared.

Character 1 Bat	Time secs	Character 2	Time secs	Total Time	Character 1 costume	Character 2 costume	Sounds	Backgrounds	Character 1 Facing	Character 2 Facing	Animation
					Bat a	Abby-a		Cave mouth	Bat face left right Bat face right		
We are the only mammals who can truly fly!	3	Wait	3			Abby c			Bat face left		
Wait	2	Woah a talking bat!	2								

4. Pupils plan their own stage directions, music & background changes to go with a previously designed and created monologue or dialogue

Pupils need their original monologue or dialogue planning which should be complete on the left hand side. If you completed the A4 planner by mistake then just stick it on the left hand side of the A3 planner.

It can help to give pupils access to Scratch so they can see what sounds and effects are available but don't let them start making until they have completed the planner.



5. Pupils code their stage directions, music & background changes

Give pupils time to make and test their changes.

Formative assessment opportunity

Give pupils time to get started and then ask them to show you one change that they planned which they have carried out. Did they do what they said? Is it in the right place?

6. Pupils test their creations

Remind pupils to test their creations regularly and adapt what doesn't work. It helps to remind pupils to do this.

7. Peer assessment of projects

A part way through the project give out post it notes and instruct everyone to set up what they have made so far. Everyone is to move around one place and assess their projects using two stars (two good things about the project) and a wish (something that needs improving). Move around a couple of times until pupils have two or more sets of comments.

Ask pupils to read the comments carefully. If there are any comments that are rude or unacceptable then it is worth training your class in polite criticism.

8. Refinement of projects responding to peer assessment

Now give pupils time to adjust their projects taking into account the comments.

Possible Summative assessment opportunities

You could assess the final finished project.

You could assess the planning.

You could assess how far the planning has been fulfilled in the final project.

You could ask pupils to tell you what a good version looks like (WAGOLL), collect their ideas and then get them to assess their own projects against the criteria.

Pupils could also assess their computational attitudes using some of the boxed statements over the page.

You can find a summative assessment quick Kahoot Quiz linked at http://code-it.co.uk/gold/

Whilst Kahoot is a limited assessment tool it is free and it is easy for teachers to pass the results back to code-it via phil.bagge@code-it.me so I can look at which method provides best short test results. Not conclusive but useful.

If you pass the results back please

1, Anonymise the results by removing the names

2, Ask the head teacher for permission

3, In the email title say which module you are doing (ie Animation D)

Research References

[1] Completion problems are suggested by Sweller in his work on cognitive load theory.

You can read about it here.

[2] Four levels of abstraction

This article includes an example of the four levels of abstraction and sign posts the work of Waite and Armoni in using them with school level pupils.

http://code-it.co.uk/algprogdiff/

Inspired by Behaviour Rubric created with @MarkDorling and linked at http://code-it.co.uk/attitudes/