Sonic Pi Curriculum and Teaching Pedagogy

"*How do you get to Carnegie Hall?* ***Practice, practice, practice***" –Unknown

Notes about the curriculum design:

This unit of work utilises the four principles from a book by Mitchel Resnick (director of MIT Media Lab's Lifelong Kindergarten research group) called Lifelong Kindergarten: Cultivating Creativity through Projects, Passion, Peers, and Play. Resnicks principles of **projects, passion, peers, and play** have been considered in the design of this unit of work in order to develop students' **interdisciplinary computational thinking**.

A computational thinking framework by Brennan and Resnick (2012) from the MIT Media Lab has been embedded in the assessment of this unit of work:

Computational concepts	Computational practice	Computational perspectives
- sequences - loops - conditionals - operators - data - parallelism	- incremental, iterative and adaptive - testing and debugging - reusing and remixing - abstraction/modularisation	- expressing - connecting - reflecting

Notes to the Teacher:

As this unit of work is **project based** (learning by making), there is a high ratio of active as opposed to passive learning. The goal for each student is so that they can **express themselves musically through programming concepts**: for example, 'if we loop that sound…' or 'iterate through a list of notes to play a melody'. A high degree of variation between **class, group, and individual discussions** have been embedded throughout all lesson sequences.

Where teacher instruction is necessary to scaffold new concepts, a Socratic style of questioning should be employed as much as possible so as to maintain a high degree of interactivity and engagement. Additionally, adapting likely known **metaphors in the students' lived experiences and cultural identity** should be drawn upon as much as possible to scaffold new knowledge creation; for example, algorithms children execute in their daily life (constructionism).

When engaged with projects, students have agency to **autonomously and self-regulate the development their own creative learning spiral** in both music and programming. They are prompted to be **emotionally engaged** through **encouraging their intuition** as opposed to the application of music theory. This unit has been designed so that that **students musically and creatively respond to authentic and topical issues** facing the world today (climate change, plastic in the oceans, and the refugee crisis).

Students are **accountable with peers in their group projects**, and the knowledge that in lesson #6 their **project will be presented** for everyone in the class to see. A learning sequence to build knowledge through defined learning outcomes has been provided, which are manifested as set goals within activities. An emphasis on **developing their computational thinking *process*** should be at the forefront of the teacher's mind when bugs and problems arise. **Support amongst peers and information sharing should be encouraged** to foster collaboration; however, with an emphasis on customisation and understanding, as opposed to blind copying of code blocks.

Students should be **encouraged to adopt a growth mindset** through the building of incremental steps in their skills and knowledge. The often quoted maxim in the music world is helpful when students express a fixed mindset "How do you get to Carnegie Hall? Practice, practice, practice" . Finally, **inform students about future study and career possibilities** to give a sense of where the development of skills in these domains can lead; I've included careers webpage on the website under the 'other' sidebar dropdown to aid this.

If you have any suggestions for any part of this unit of work, email me at petriechris@gmail.com and I'll be happy to hear your thoughts (or typo corrections)!

PLEASE NOTE:

→ This curriculum plan has been designed as part of a Master's thesis in Education. A mixed method case study has been conducted on this unit of work. The final thesis and other associated publications will be posted on this website once they've been published.

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