Welcome!

We will be thinking about current trends in the use of technologies across the curriculum as well as emerging pedagogical approaches in the teaching of computing in primary schools:

- Developing ideas for computational thinking in primary schools and the relevance of unplugged approaches
- Working with European partners to explore the theme of 'Digital Learning across Boundaries'
- Multisensory approaches supporting special educational needs and inclusion

Helen Caldwell

Books

- Caldwell H. & Cullingford-Agnew, S. (2017 publication pending). *Technology for SEND in Primary Schools: A good practice guide.* London: Sage.
- Caldwell, H. & Smith, N (2016). *Computing Unplugged: Exploring primary computing through practical activities away from the computer.* London: Sage.
- Wise, N. & Caldwell, H. (2016). *Help with Homework: Coding Essentials.* Chichester: Igloo Books.
- Caldwell, H. & Bird, J. (2015). *Teaching with Tablets*. London: Sage.
- Caldwell, H., Heaton, R., Whewell, E. & Grantham, S. (2015) *Switched on iPads Science*. London: Rising Stars.
- Bird, J., Caldwell, H. & Mayne, P. (2014). *Lessons in Teaching Computing in Primary Schools*. London: Sage.

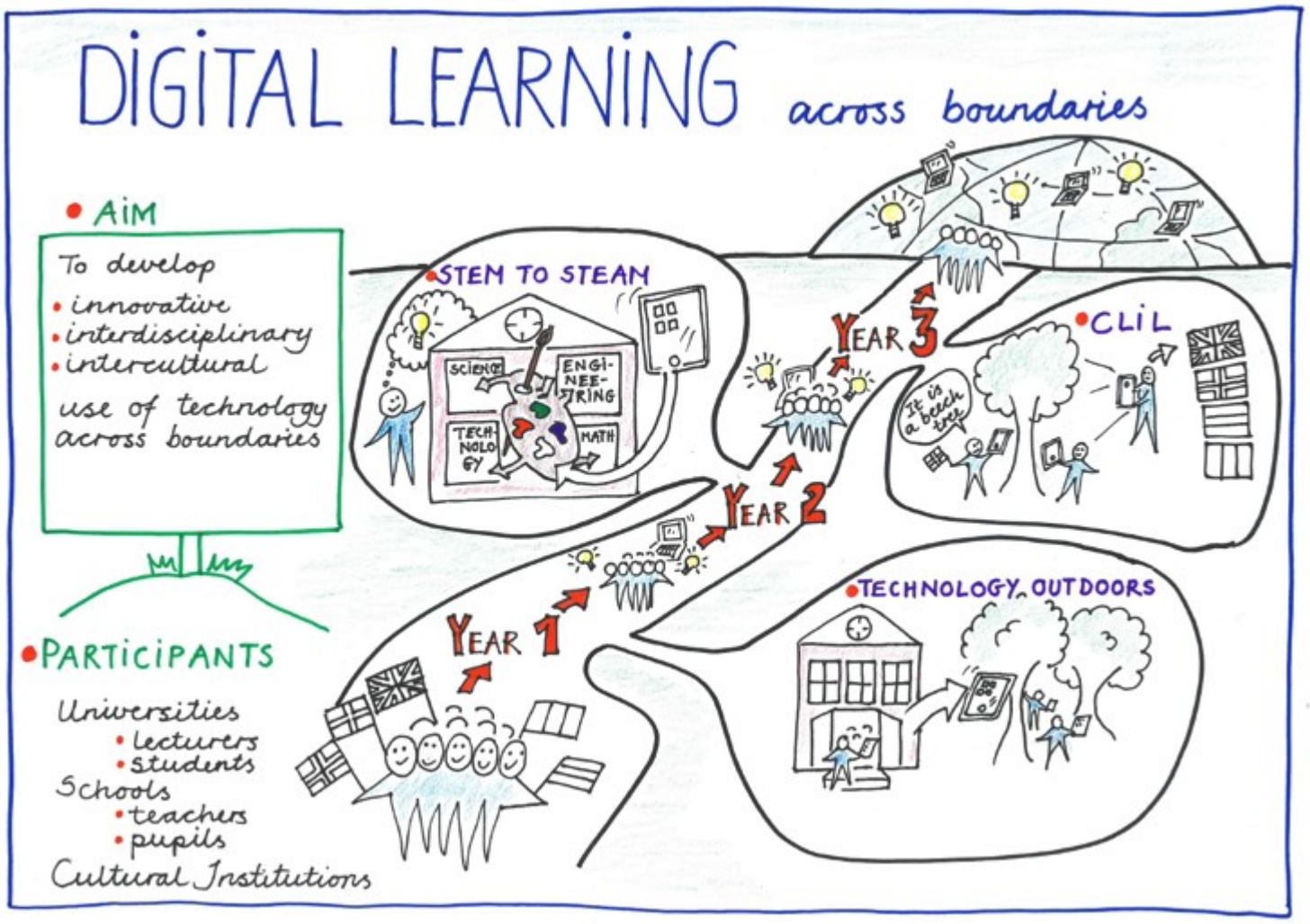
MOOCs

- Let's Teach Computing 2015
- Teaching with Tablets 2016
- Involved with 12 Apps of Christmas 2016

Current Project

- **Digital Learning Across Boundaries** International Erasmus project

DLaB project



…crossing boundaries of space, subjects and languages

Primary Computing

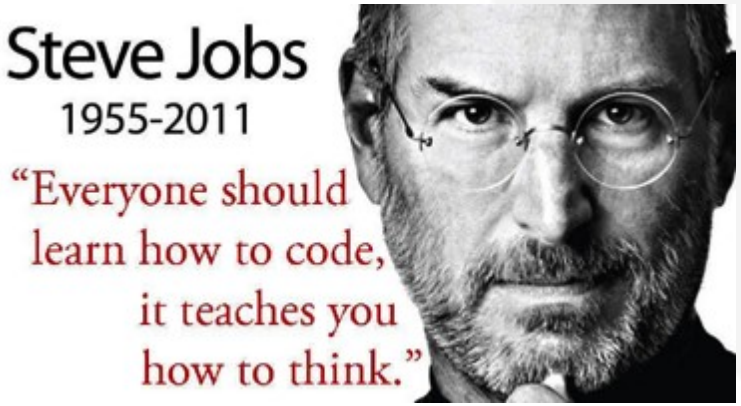
- Children will ‘use computational thinking and creativity to understand and change the world’
- Begin by building metacognition using the key concepts and approaches so that thinking strategies are explicit and transferable
- Unplugged plugged and real world applications

…where do we start with primary computing?

What's expected

KS1

- Understanding of what an algorithm is.
- Understanding of what a program is.
- Use of precise and unambiguous instructions within programs.
- To debug a program.
- To apply logical reasoning to predict how a program or computer code will work.



What's expected

KS2

- Design, write and debug programs
- Solve problems by applying decomposition.
- Use sequence, selection and repetition in programs.
- Work with variables
- Understanding of various forms of input/output.
- Apply logical reasoning to explain and debug algorithms and programs.
- Explain how computer networks are used, including the internet.
- Explain how search results are selected and ranked.

…not forgetting

- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

UpTIME: scaffolding planning

UPTIME

'UpTIME' is a teaching sequence for primary computing. It stands for:

- Use/play
- Tinker
- Improve
- Make
- Evaluate

Image from pixabay.com

Teaching Primary Computing

Getting Started

UpTIME

Setting Learning Challenges

Research

About this site

Constructivism, based on students' active participation in problem-solving and critical thinking, has profoundly influenced the teaching of programming (Ben-Ari 1998). It implies a need for authentic and meaningful experiences to support learning based on prior experiences and models of the world.

Sentance, S. and Csizmadia, A., 2016. Computing in the curriculum: Challenges and strategies from a teacher's perspective. *Education and Information Technologies*, pp.1-27.

https://challengingcomputing.wordpress.com/uptime/
Chris Shelton University of Chichester

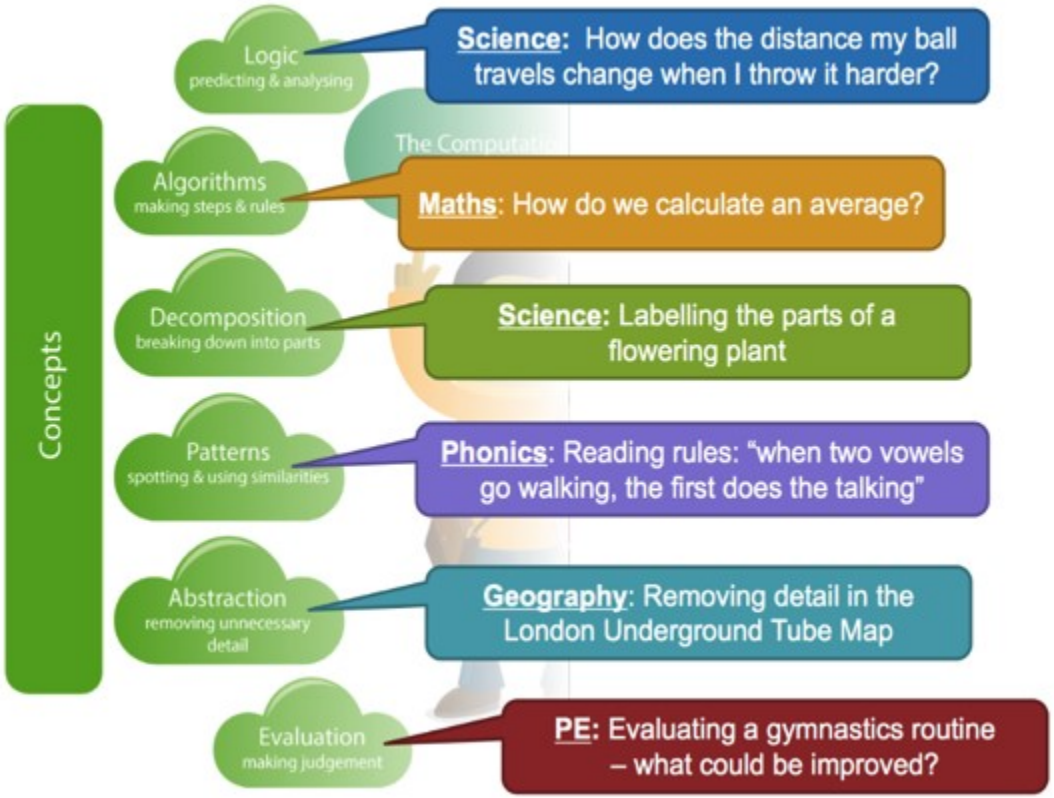
…building teachers' repertoire rather than recipes

THE UNIVERSITY OF NORTHAMPTON

Ideas to reinforce key vocabulary…

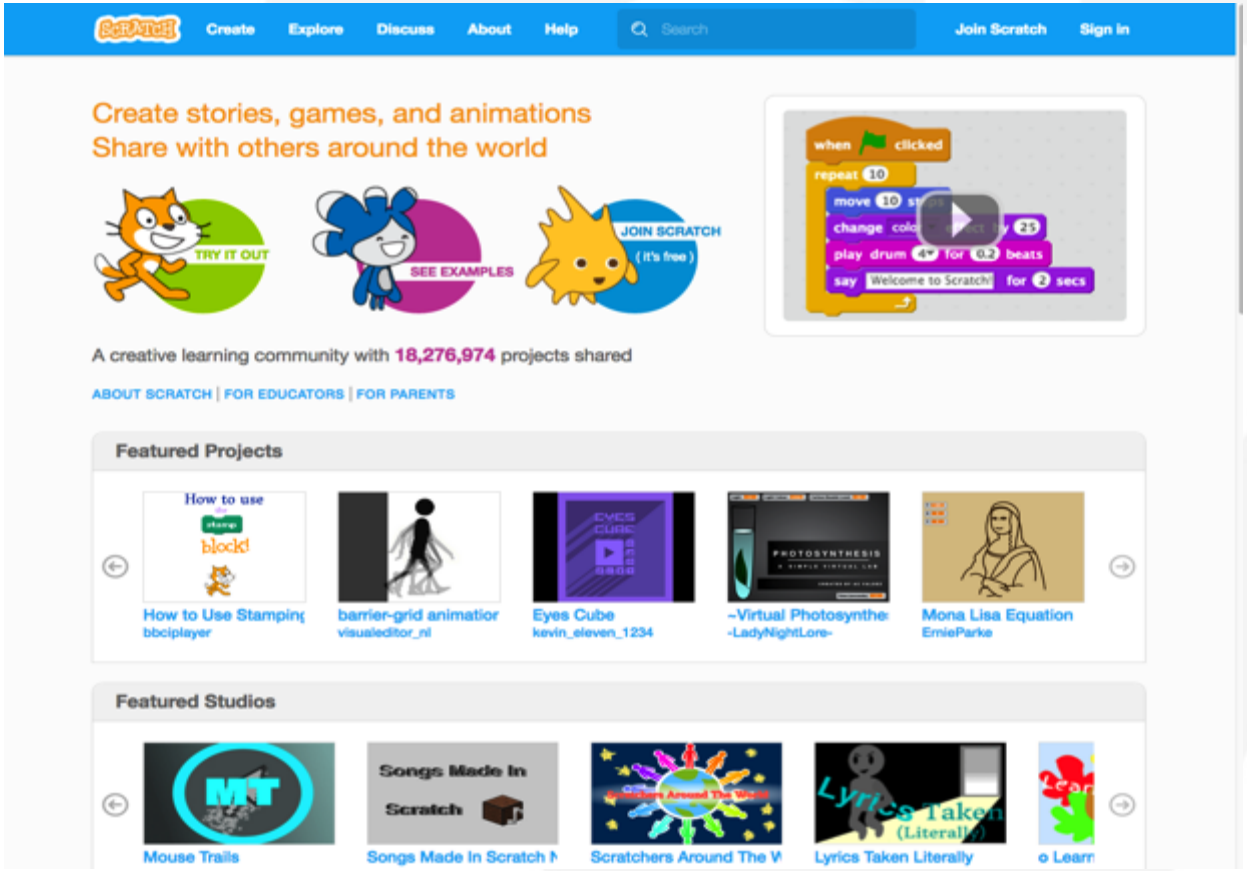
Computational thinking across subjects

Digital makers: creators, collaborators, digitally critical, responsible and active learners who use computational thinking across the curriculum



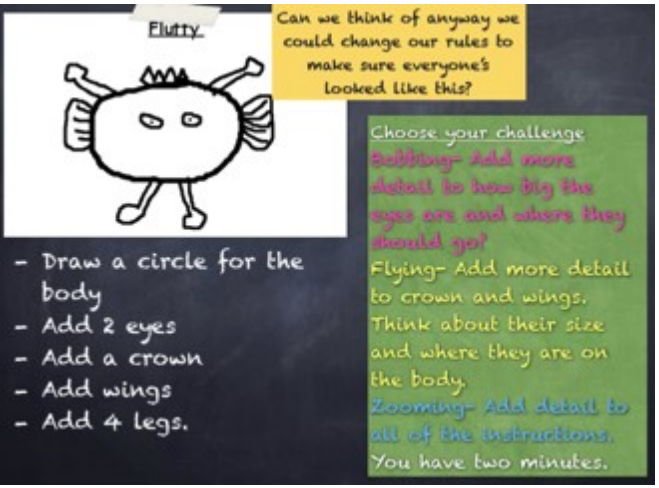
Scratch 2.0 community

Moving from computational thinking to computational participation: “the ability to solve problems with others, design systems for and with others, and draw on computer science concepts, practices and perspectives to understand the cultural and social natures of human behaviour” (Kafai and Burke 2014)



…computational participation, reusing ideas

Computing unplugged



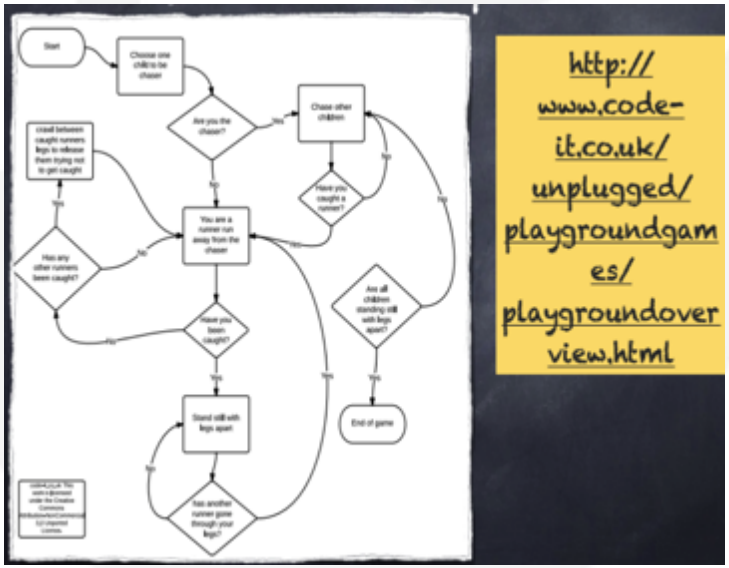
Pancake Recipe

Ingredients:

- 100g plain flour
- 1 egg
- 300ml milk
- Pinch of salt
- 50g butter

Method:

1) Sieve flour and salt into a mixing bowl
2) Make a well in the flour and break the egg into the well. Whisk the egg and flour mixture
3) Gradually add the milk and beat to create a smooth batter (consistency of thin cream)
4) Heat the butter in a pan. When butter melted, turn heat down to medium
5) Coat the base of the pan with pancake mixture (using a ladle is great!)
6) Cook for one minutes before flipping the pancake and cooking the other side for 30 seconds
7) Enjoy!



http://www.code-it.co.uk/unplugged/playgroundgames/playgroundoverview.html

…kinesthetic active learning

Everyday algorithms

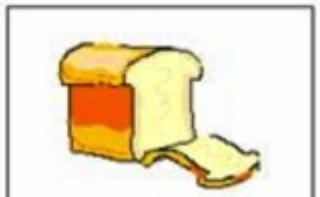
Chair stacking

Repeat 32 times:
If previous chair is stacked:
Stand behind chair
Pick up chair
Walk to the aisle
Walk to front of the first set of tables
If there are no chairs there:
Place chair nearest the door
Else
If there are less than 5 chairs in the stack:
Add chair to stack
Else
Make new stack next to previous
Else
Wait

…computational thinking in everyday tasks

Thanks to @swaygrantham

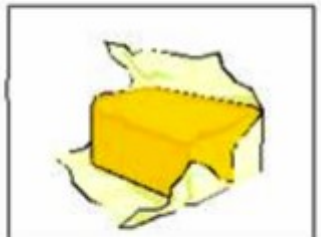
How do I make that?...decomposition



Get a slice of bread.

Eat the sandwich.

Spread the jam on the bread.



Get some butter.

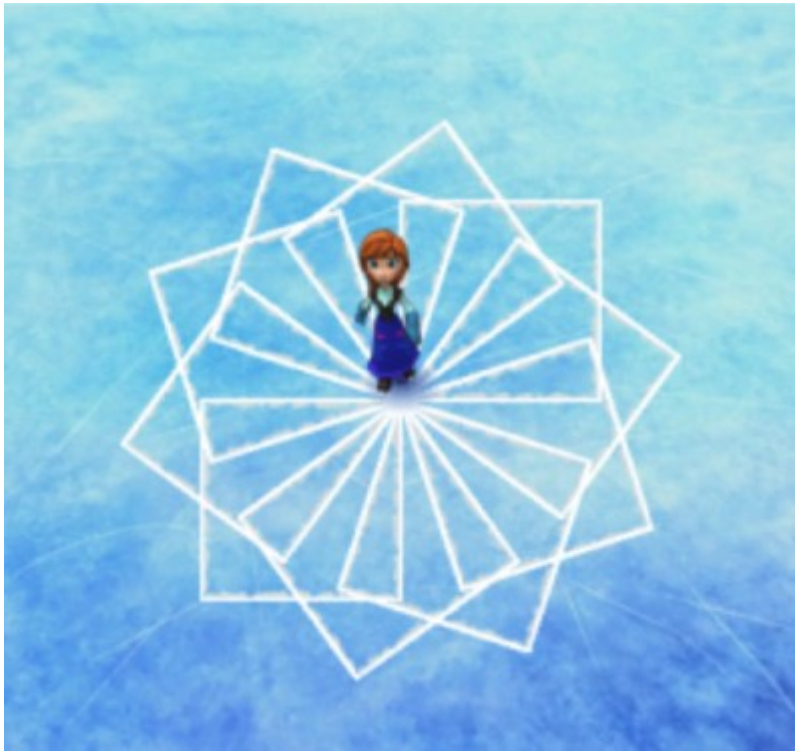
Spread the butter on the bread.

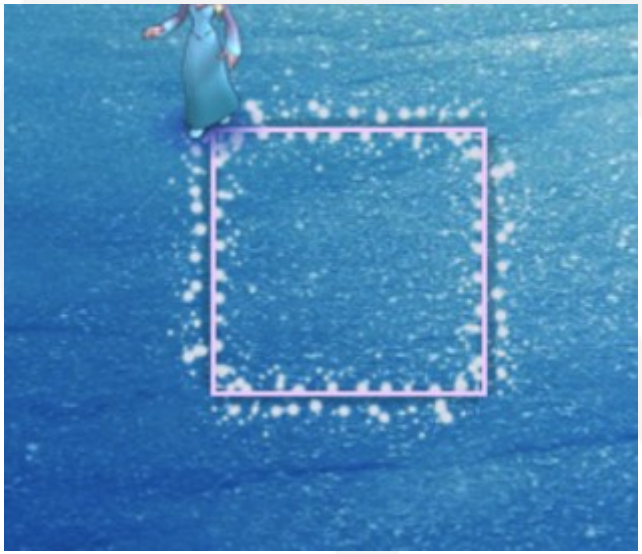
Get some jam.

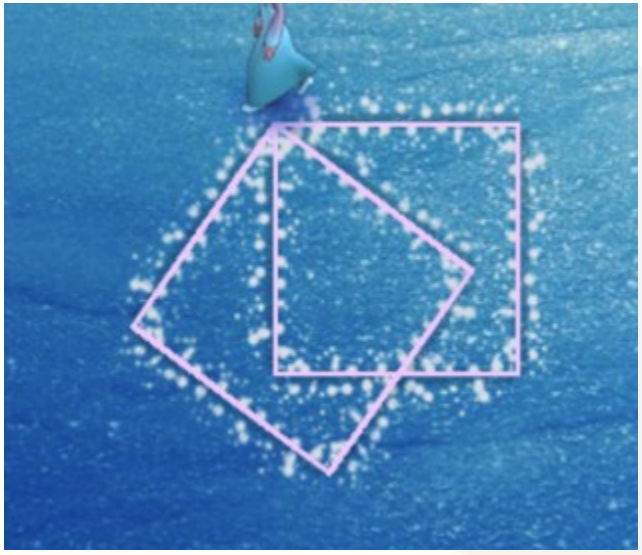
...generalise to other contexts

Thanks to @swaygrantham

How do I program this?



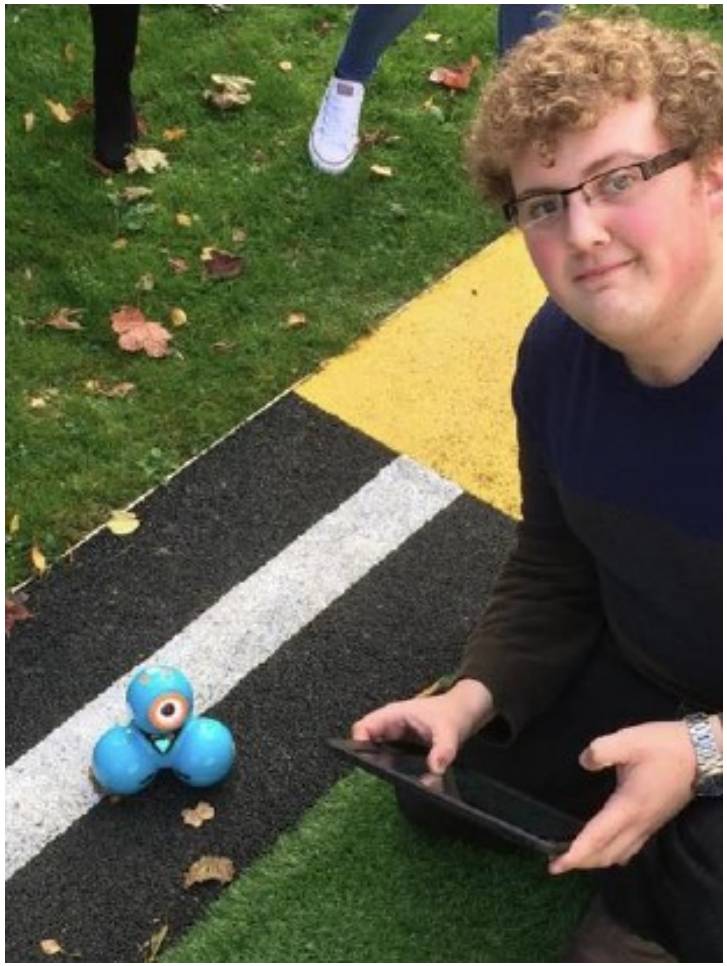


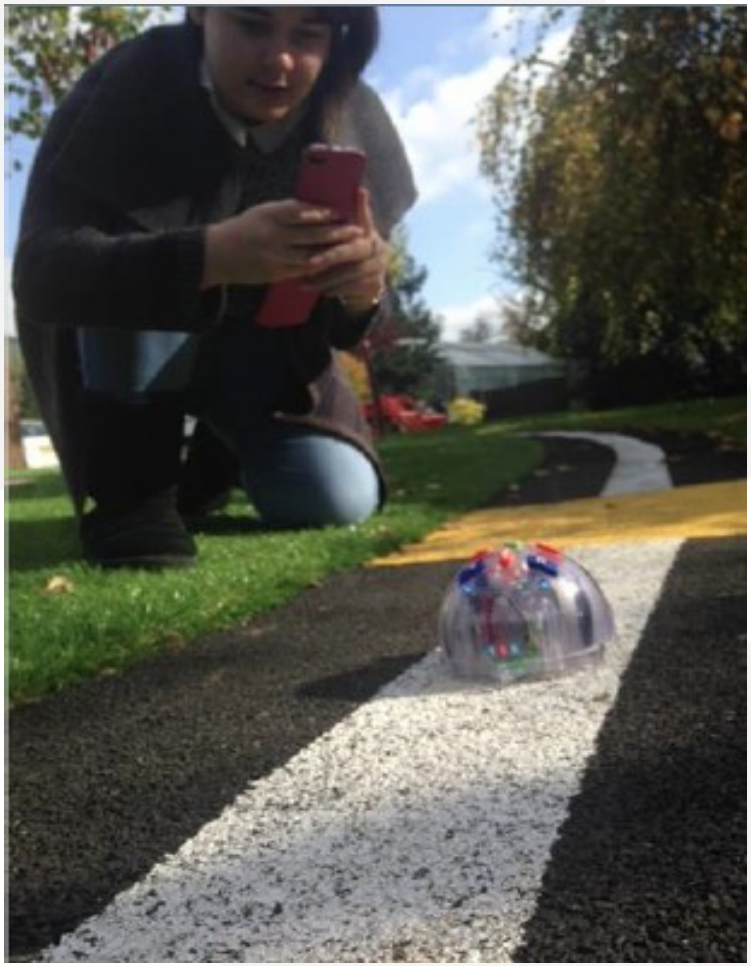


…reuse strategies

Rescue Robots

Robots outdoors



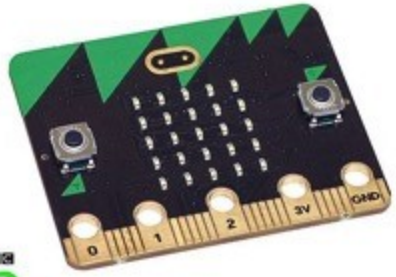


Makey Makey Playdate

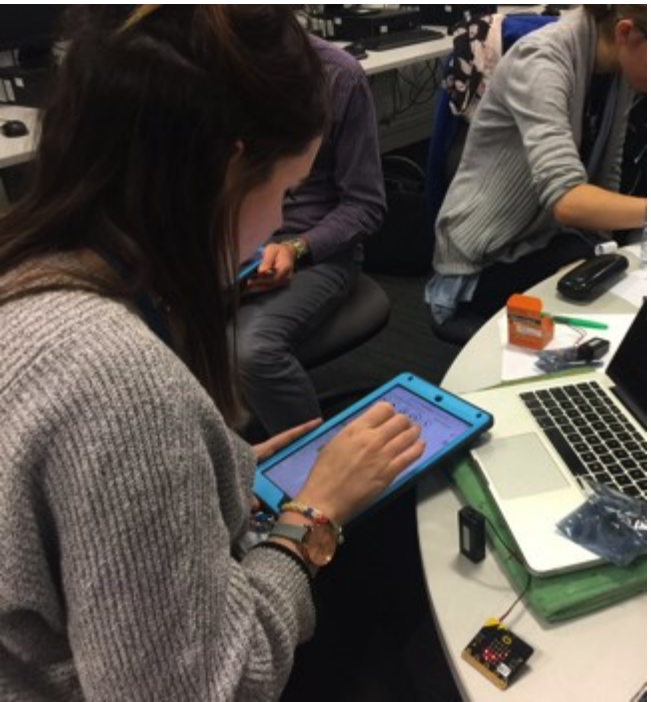
…time for tinkering and experimenting

Deconstructing technology

Wearable tech



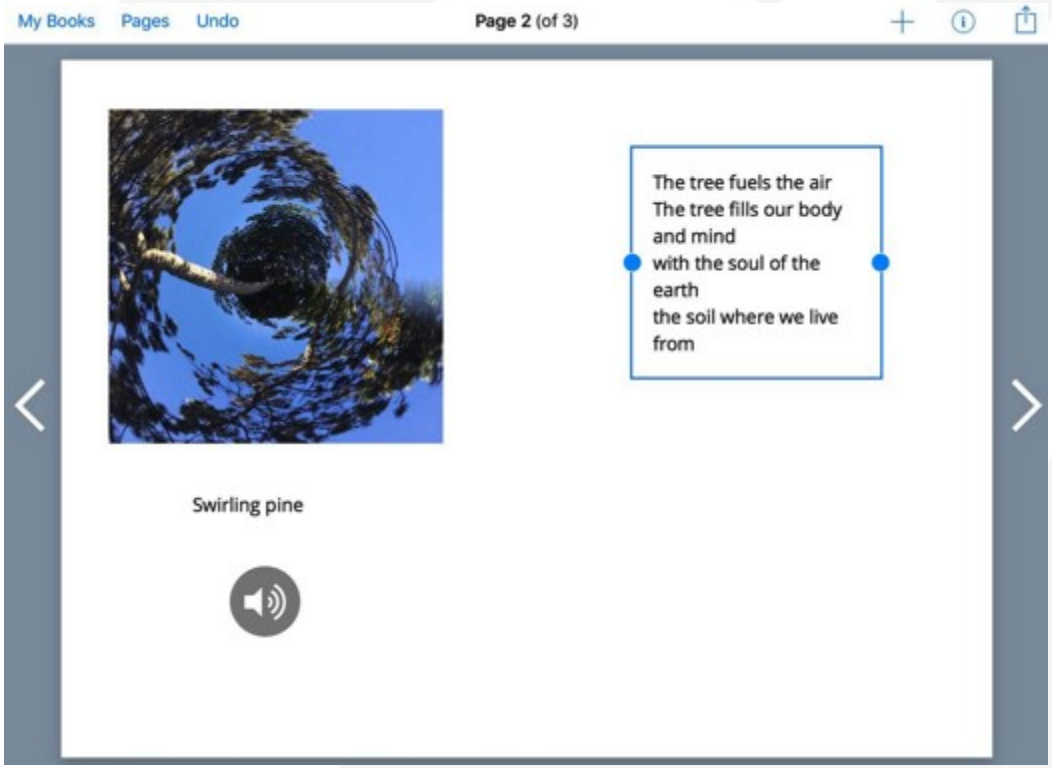
micro:bit



…inspired by computing and performance

Mobile learning outdoors: Wild writing

Wild writing

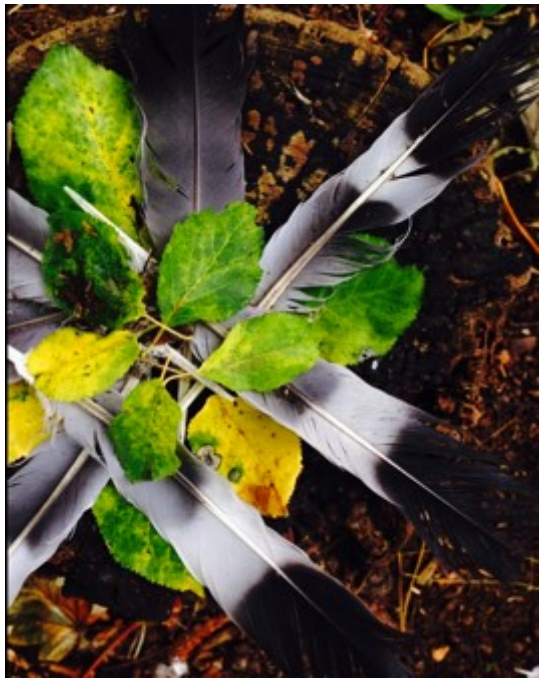


…manipulating images and viewpoints

Manipulating media

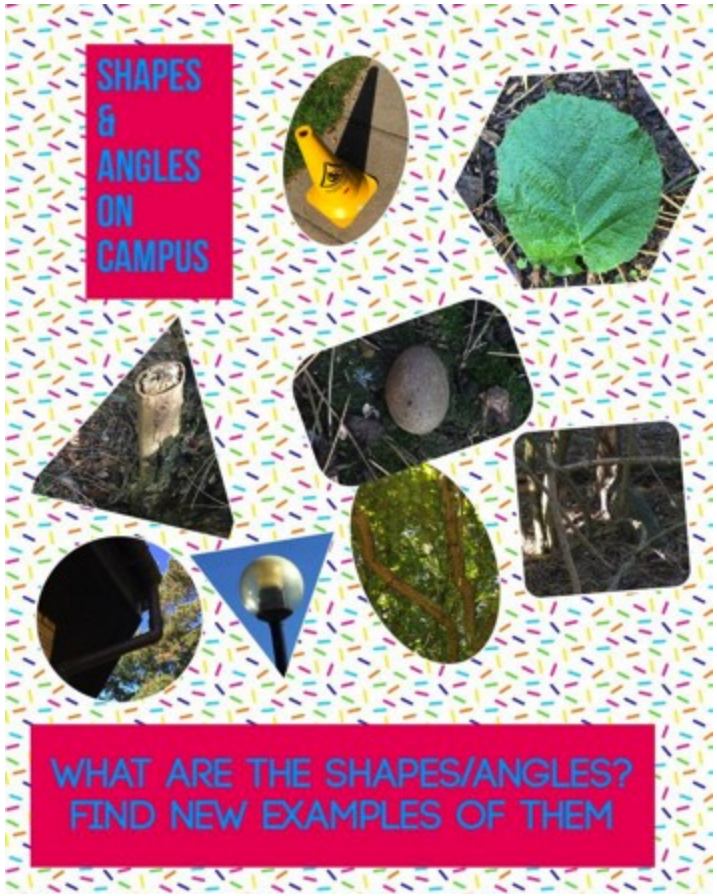
…from green screening to VR 360

Ephemeral art



…transient art in the environment

Creating trails

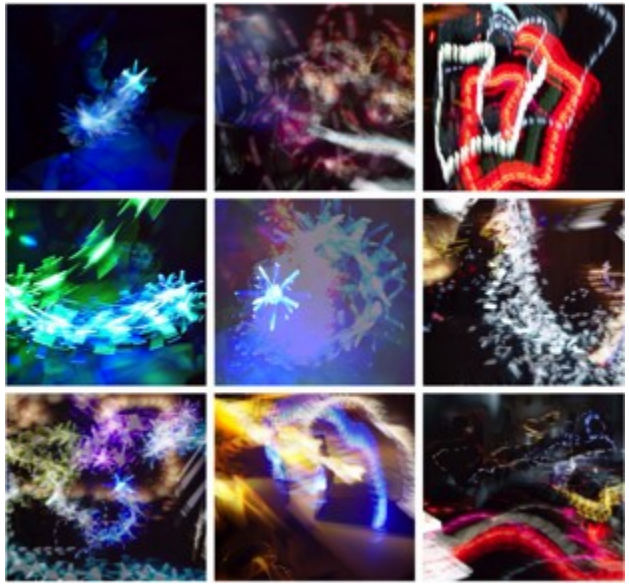


...combining digital and physical exploration

Technology supporting SEND

…multisensory environments for storytelling

Technology supporting SEND



...working with light

Technology supporting SEND

…open-ended content-creation apps

…bridging formal and informal learning

Postgraduate Certificate in Primary Computing

- 60 Masters' credits through 2 modules over 2 years
- Online course with optional face to face sessions and continual tutor support
- Shared enquiry with fellow teachers in an online community
- Designed to help you lead positive change in your school
- Flexible content across computing and digital literacy
- Assessment tasks linking classroom practice with theory and research
- No need to be an expert in the field

Contact
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Free resources

- Barefoot Computing- http://barefootcas.org.uk
- BBC Podcasts Code Crackers- 5-7yrs old
- BBC Bitesize- choose key stage and then computing- http://www.bbc.co.uk/education/subjects/zyhbwmn
- code.org- Hour of code or whole unit. http://code.org/
- Primary Quickstart- http://primary.quickstartcomputing.org
- https://www.codeclub.org.uk/- Free resources for Micro:bits, Scratch and Python projects.
- Computer Science Unplugged:
- http://csunplugged.org/
- Junior Computer Science on Code-it.co.uk http://code-it.co.uk/csplanning.html
- Teach London Computing http://teachinglondoncomputing.org/

Benefits of joining ITTE

- Vibrant, well-informed newsletter.
- Opportunities to contribute to books.
- ITTE journal, Technology, Pedagogy and Education, brings together international research.
- ITTE members' research is cutting edge.
- Our academic members make behind-paywall research available to teachers
- ITTE has a long history of being involved in policy consultation.
- Strong international links.

Contact

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Video links for SEN work

https://youtu.be/-KcYLtJFkbk

https://youtu.be/_cEnkjmg_ro