

Technology to understand and change the world

La technologie pour comprendre et faire évoluer le monde

Can digital experiences based on real world exploration give children positive feelings of astonishment, awe and wonder?

Les expériences numériques basées sur l'exploration réelle du monde, peuvent-elles engendrer chez les enfants de l'émerveillement et de la surprise?



...technology transforming learning

Educational technology trends

Edtech – les tendances

Themes from my recent work:

- Pedagogical approaches:
Computational thinking
Design thinking
- Technologies across the curriculum:
Outdoor learning
STEAM



...strands of current work

Primary Computing

Le codage au primaire

- Children will 'use computational thinking and creativity to understand and change the world' (National Curriculum)
- Begin by building metacognition using the key concepts and approaches so that thinking strategies are explicit and transferable
- Combine unplugged, plugged and real world applications



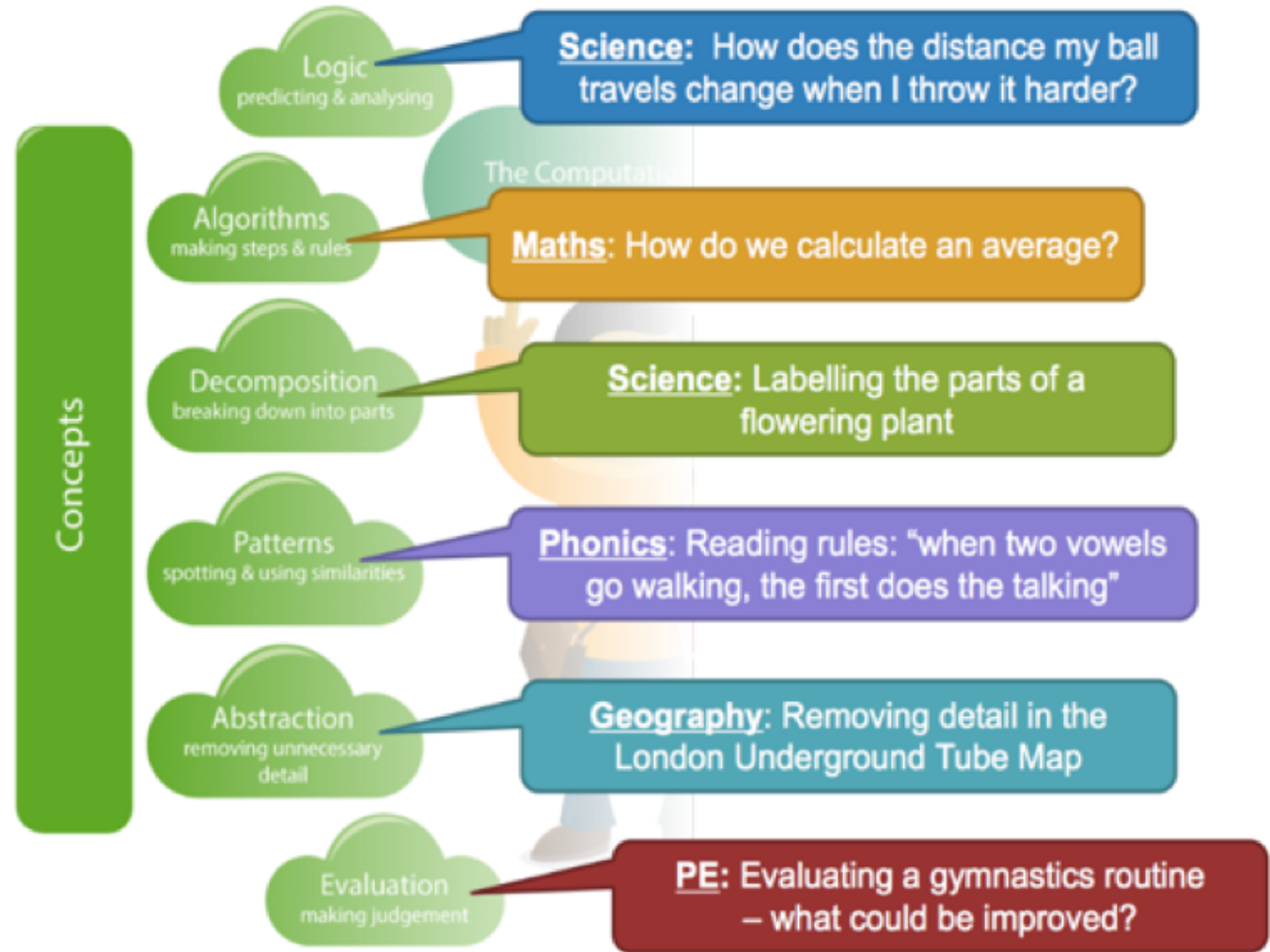
Barefoot would like to acknowledge the work of Julia Briggs and the eLIM team at Somerset County Council for their contribution to this poster.

...where to start with primary computing?

Computational thinking

La réflexion et le codage

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



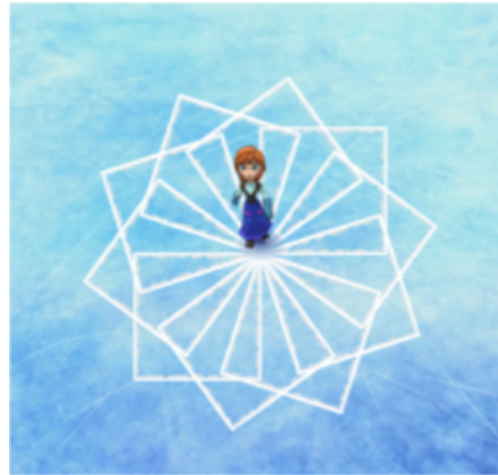
...demystifying and reinforcing

Build repertoire rather than recipes Construire du répertoire et pas des recettes

UP**T**IME
Use
Play
Tinker
Improve
Make
Evaluate

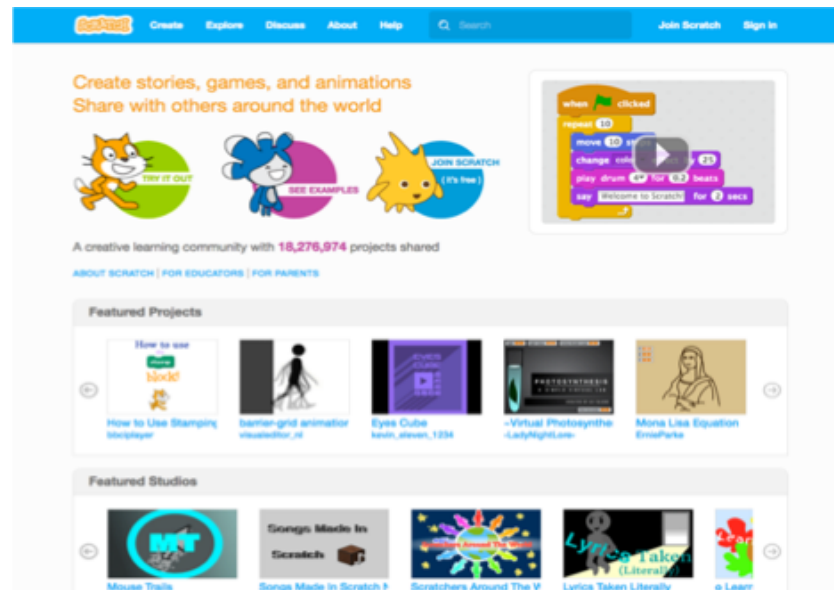
<https://challengingcomputing.wordpress.com/uptime/>

Chris Shelton University of
Chichester



Coding recipes are not purposeful and challenging. Rather than easy wins, we should do projects that build a coding repertoire not recipes.

Moving from computational thinking to computational participation (Kafai and Burke 2014). Coding as a social activity.



...UPTIME scaffolding learning-driven planning

Computing unplugged

Le numérique – loin de l'écran

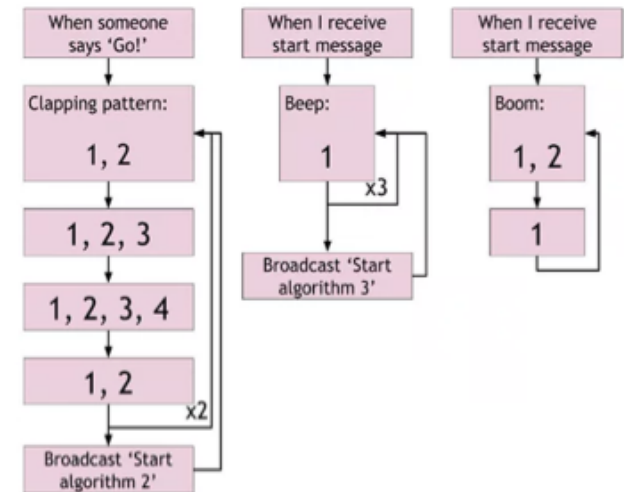
Teaching computing? Try switching off your screens

From robot hamsters to beatboxing, there are plenty of activities to help students develop thinking skills associated with programming. No computers needed

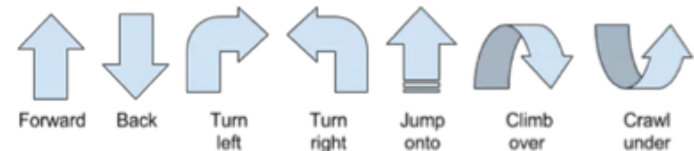


Moving away from computers can often help students understand ideas behind programming without being distracted by the technology. Photograph: Alamy

Human beatbox



Robot hamster playground



Everyday algorithms

Les algorithms du quotidien

Chair stacking

Repeat 32 times:

If previous chair is stacked:

Then 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:

Then 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

Makey Makey Playdate



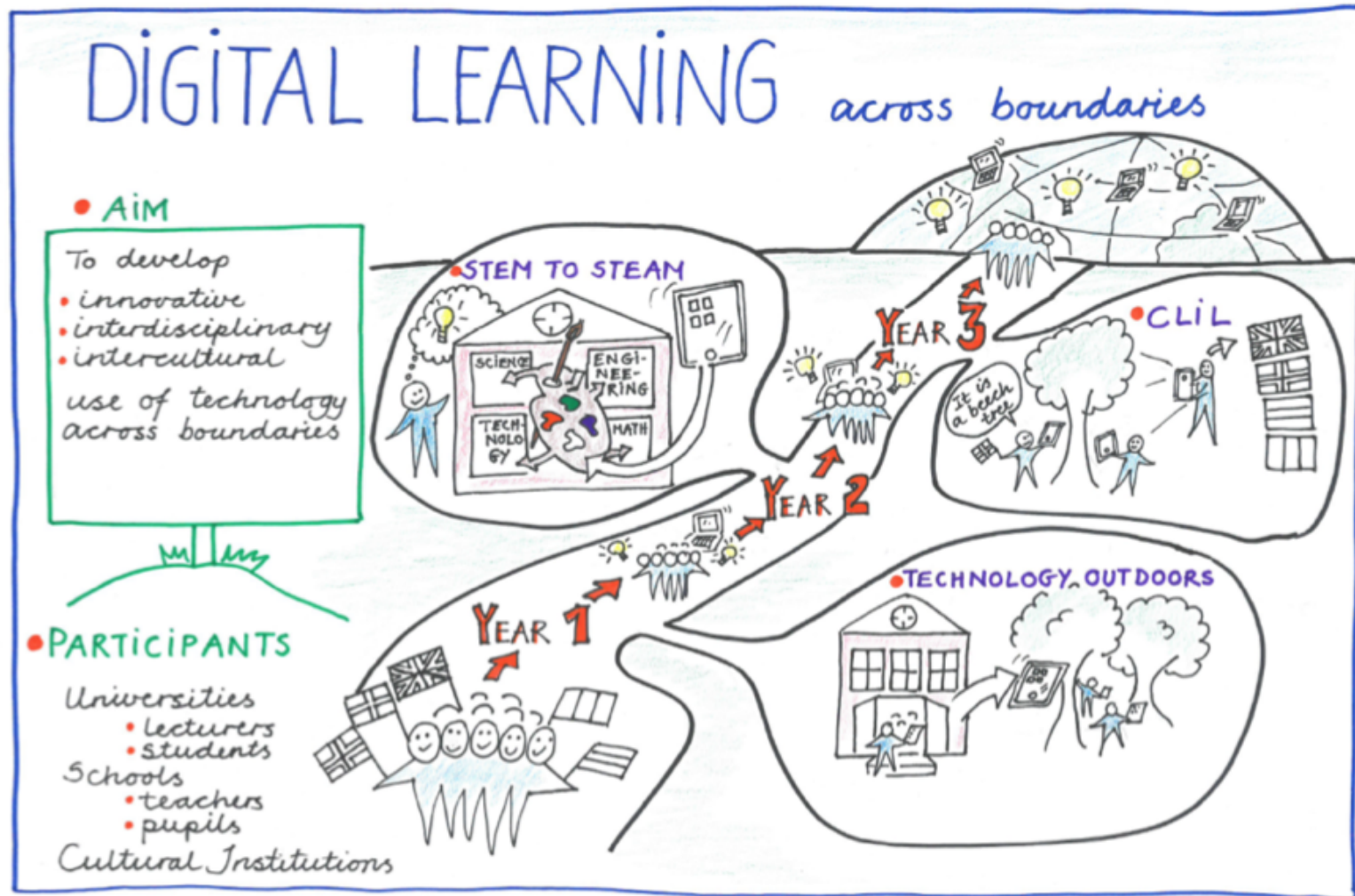
...time for tinkering and experimenting

Rescue Robots



...real world applications

Erasmus+ and eTwinning



<http://dlaberasmus.eu/>

<https://plus.google.com/communities/117458443566280105364>

...crossing boundaries of space, subjects and languages

Ephemeral art



Science links:

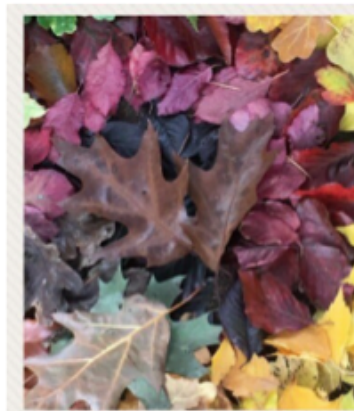
Freezing and melting

Decay

Evaporation

Condensation

Light



...transient art in the environment

Art swaps



<http://www.pictaculous.com>

<http://www.sketchbookcircle.com>

<http://virtualpaintout.blogspot.co.uk>



...technology as a lens for looking at the world

Virtual sculptures



...building bridges with others through art

UoN University of Northampton



I am the pencil



...Ramblr, MapMyWalk, QR codes, PicCollage, Leafsnap

Walking a line



Look up
Sleeping rain
Red kite
Gliding
Swooping
Wing full of wishes
Beak full of menace
Hide
Coming for you
Stay alert
Survive



Walking a line in the park
Stopping after 15 steps
Looking down 15 times

Green grass
White daisy
Lost leaf
Broken twigs
Flight feather
Plastic litter
New leaves
Young dandelion
Gnarled roots
Fluffy feather
Small stone
Pink petals
Pink petals
Pink petals



Who's in this photo?

<http://www.richardlong.org>

...photo-journeys inspiring writing

Wild writing

What's in the drawers?

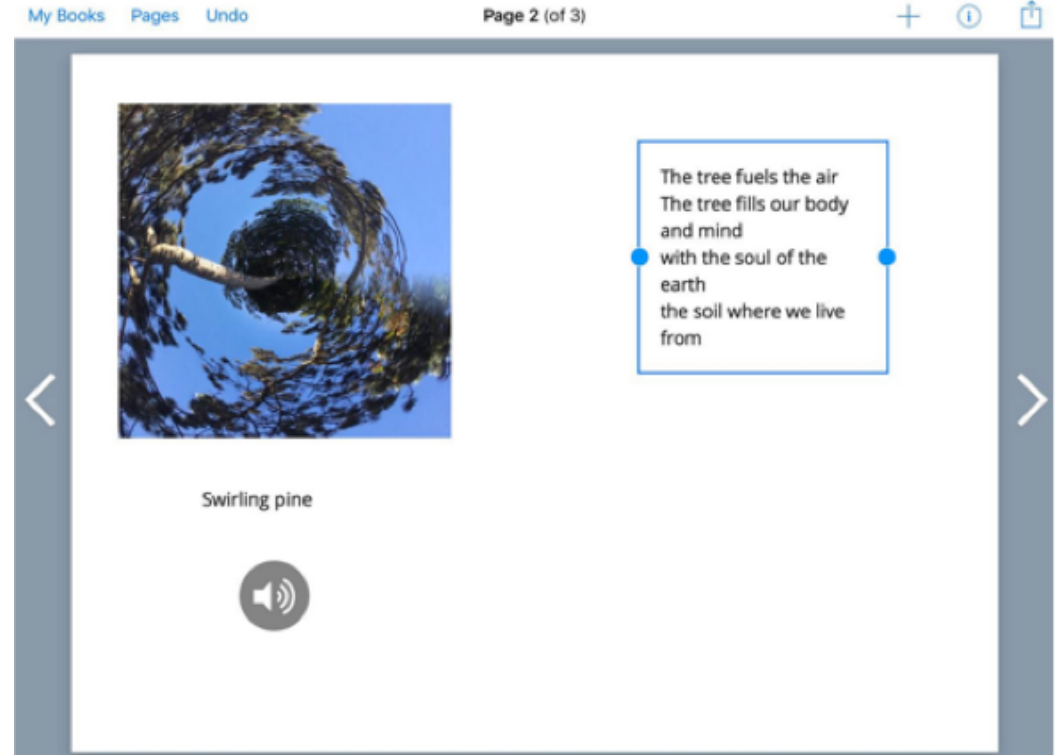


The secret life of the outdoors



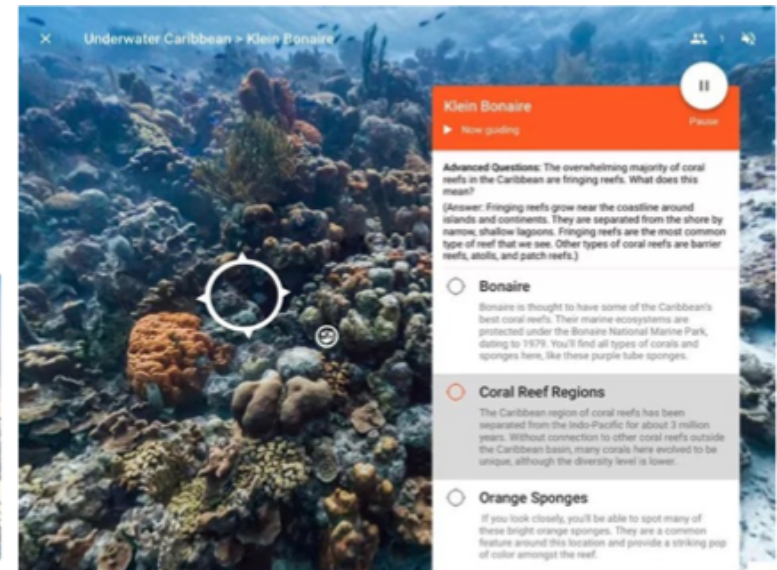
...mobiles capturing outdoor learning

Wild writing



...manipulating images and viewpoints

Bringing the outside in – faire rentrer le monde



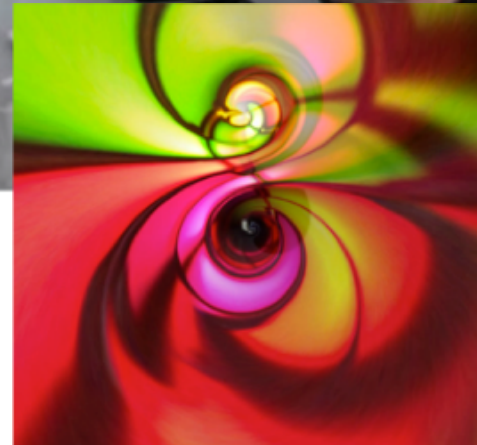
...AR and VR merging real and virtual worlds

Manipulating media – S'approprier les média



...from green screening to VR 360 as a creative medium

Technology supporting SEND



Apps:
Rollworld
Fragment
Be Funky

...working with light

Digital meets physical

Le numérique rencontre le physique



...moving between digital and physical spaces

Exploring STEAM

Le concept de 'STEAM' - science, technology, engineering, art, maths



Digital Learning across Boundaries through
adding the Arts to STEM

A DLaB STEAM activity uses digital technologies to cross boundaries by adding the arts into STEM and providing opportunities to build intercultural connections.

STEAM weeks – des semaine 'STEAM'



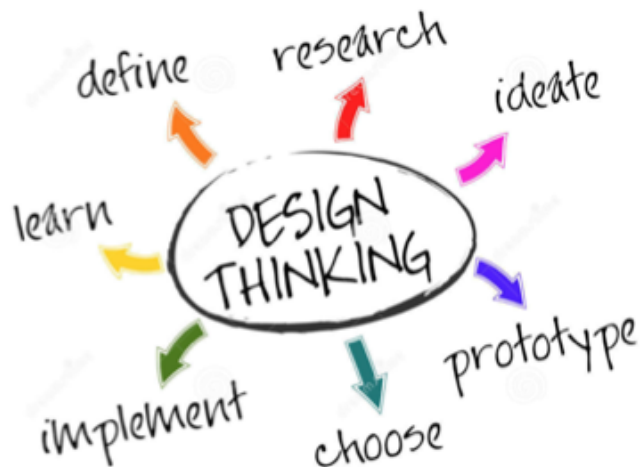
STEAM with Design Thinking

STEAM et le concept de 'Design Thinking'



Think about a three part plan:

1. A trigger
2. A vision and plan
3. A creative solution



...digital makers discovering solutions

Seeing, hearing and experiencing STEAM

Regarder, entendre et vivre le concept STEAM

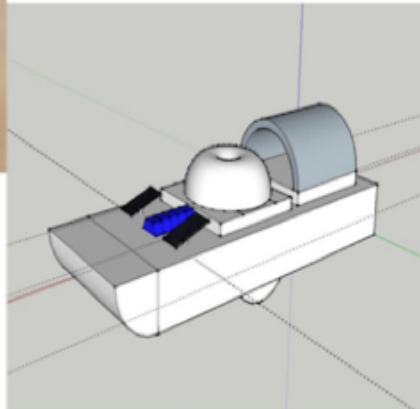
Overlapping arts:

1. Visual art, drawing, painting, printmaking, collage, photography, textiles, sculpture, installation, digital arts, graffiti
2. Music and sounds, sound art, spoken word
3. Drama, performance, dance, spoken word
4. Literature, poetry, written text, sci fi, comics



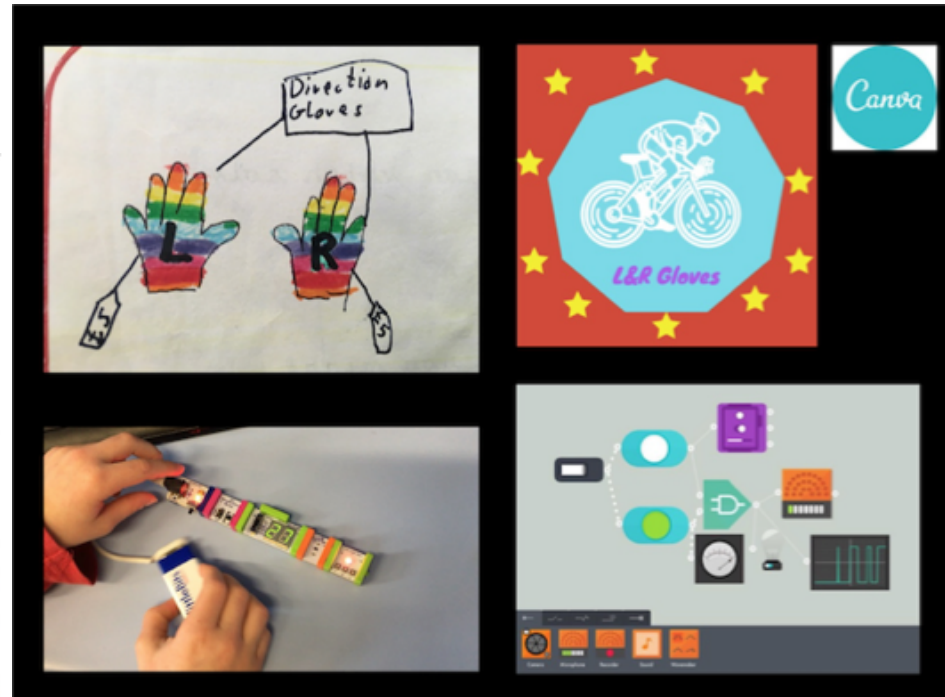
The Solar Sea Sweeper

A solar-powered water vehicle that collects and compacts waste



The Sea Dog

A robotic dog that swims and collects rubbish from the ocean

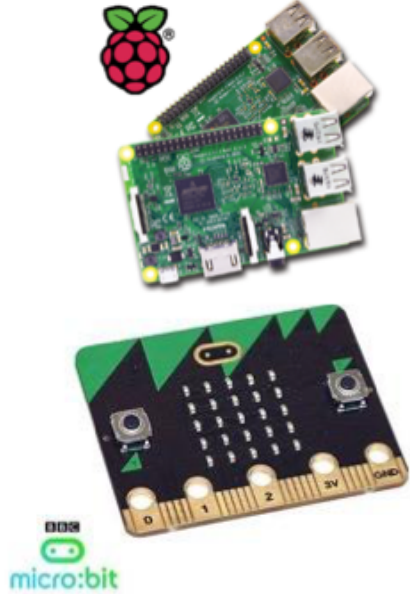


...tinkering, making and inventing

Makerspaces and breakerspaces



Wearables and the Internet of Things



And we have a t shirt that lights up when you jump! @neilnjae
@SwayGrantham @JeanEd70



Wearable tech Pointe Shoes [arra]stre



...inspired by computing and performance

Technology transforming learning

La technology qui transforme l'apprentissage



...bridging formal and informal learning and multiplying learning opportunities

Helen Caldwell

Apple Distinguished Educator
Raspberry Pi Certified Educator

Books

- Caldwell H. & Cullingford-Agnew, S. (2017). *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
- Technology Outdoors 2017

Current Project

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

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Links

DLaB community

<http://bit.ly/DLaBErasmus>

DLaB website

<http://dlaberasmus.eu/>