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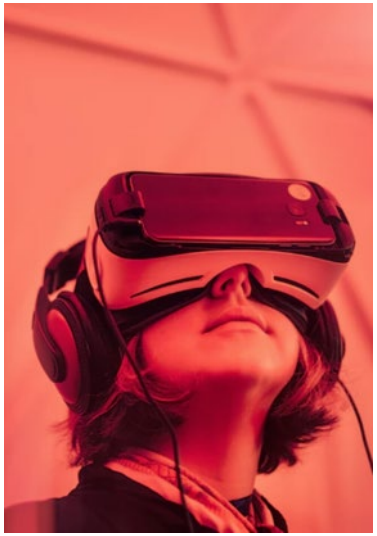
Technology to understand and change the world

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



Educational technology trends

Themes from my recent work:

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

…strands of current work

Primary Computing

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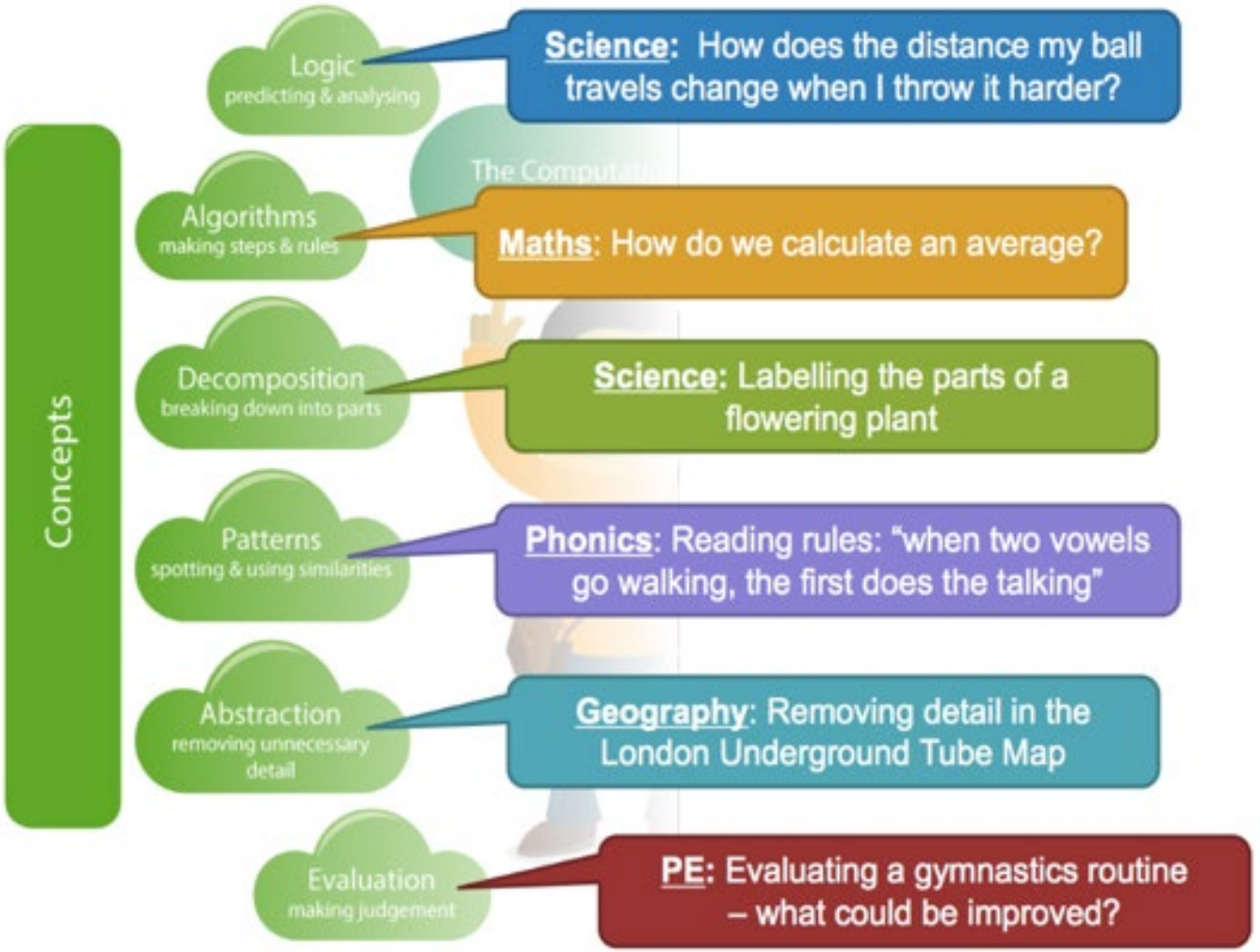
- Children will 'use computational thinking and creativity to understand and change the world' (National Curriculum)
- Begin by building metacognition using the key concepts and approaches so that thinking strategies are explicit and transferable
- Combine unplugged, plugged and real world applications

…where to start with primary computing?

Computational thinking

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



…demystifying and reinforcing

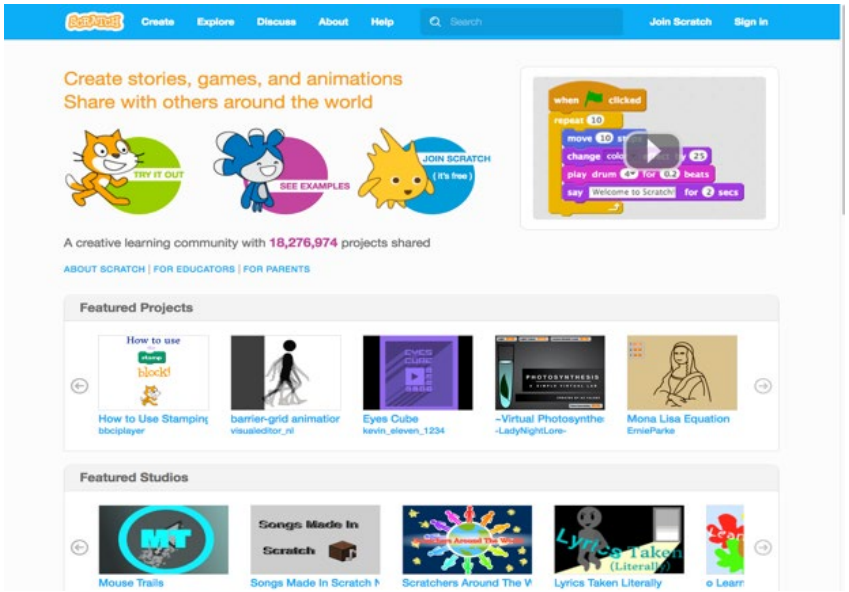
Build repertoire rather than recipes

UPTIME
Use
Play
Tinker
Improve
Make
Evaluate

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.

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



…UPTIME scaffolding learning-driven planning

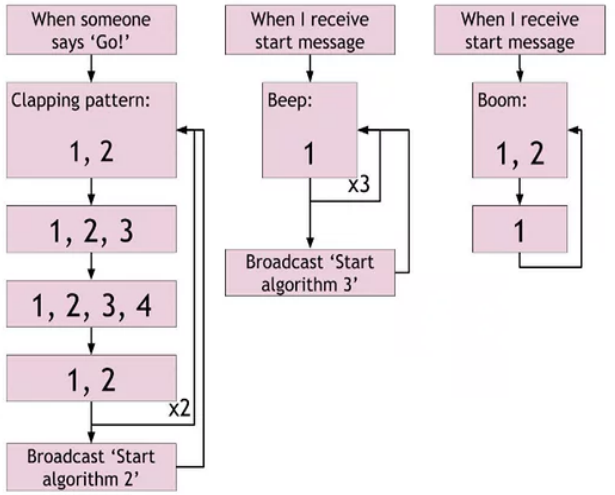
Computing unplugged

Teaching computing? Try switching off your screens

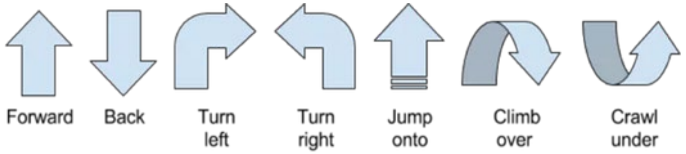
From robot hamsters to beatboxing, there are plenty of activities to help students develop thinking skills associated with programming. No computers needed

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



https://www.theguardian.com/teacher-network/2017/mar/01/teaching-computing-try-switching-off-your-screens

…kinaesthetic active learning

Everyday algorithms

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

Thanks to @swaygrantham

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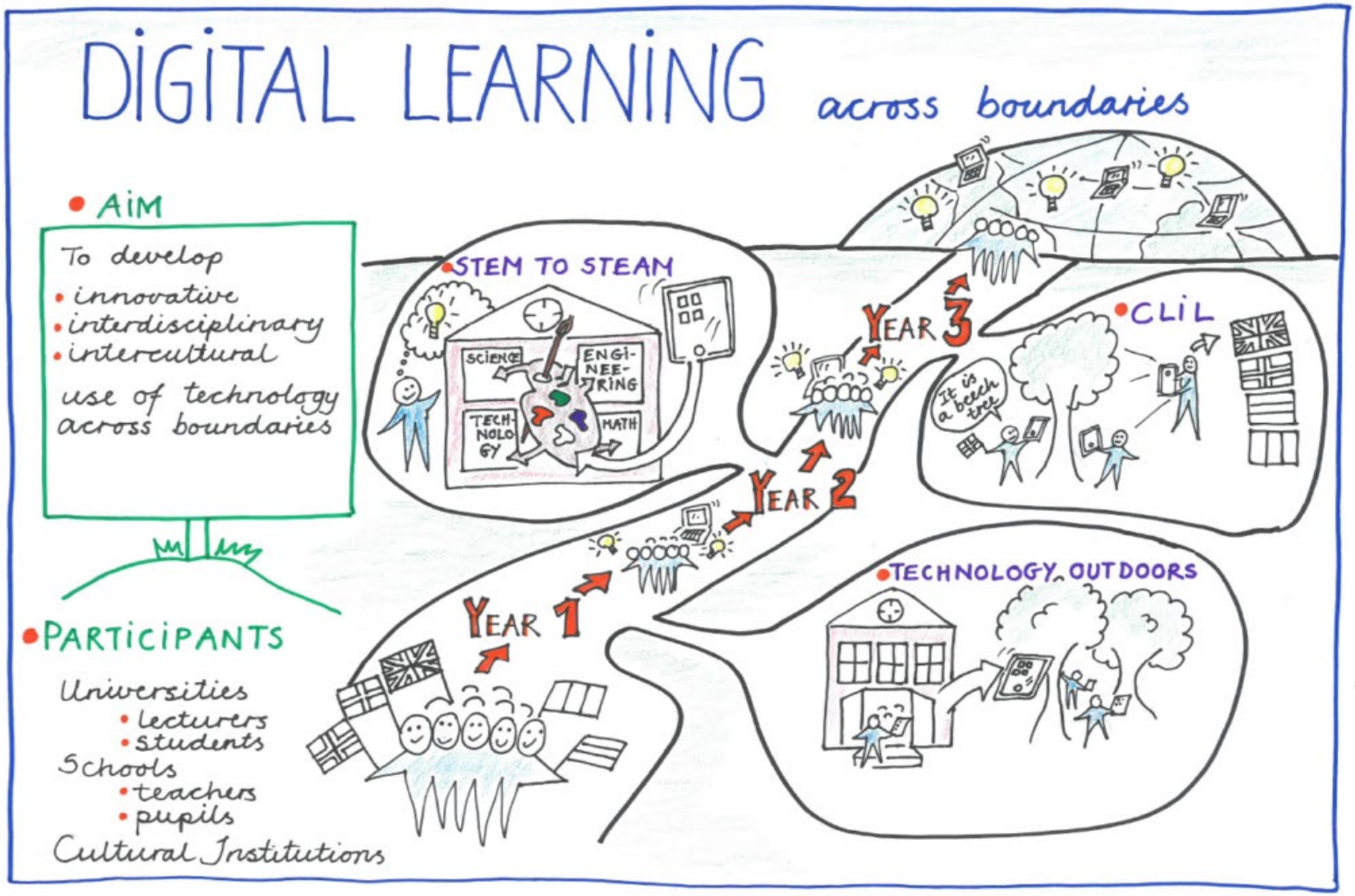
Makey Makey Playdate

…time for tinkering and experimenting

Rescue Robots

…real world applications

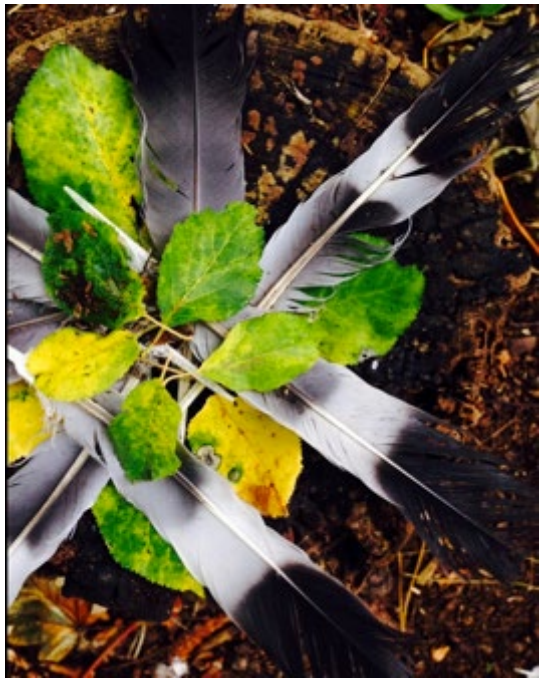
Erasmus+ and eTwinning



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

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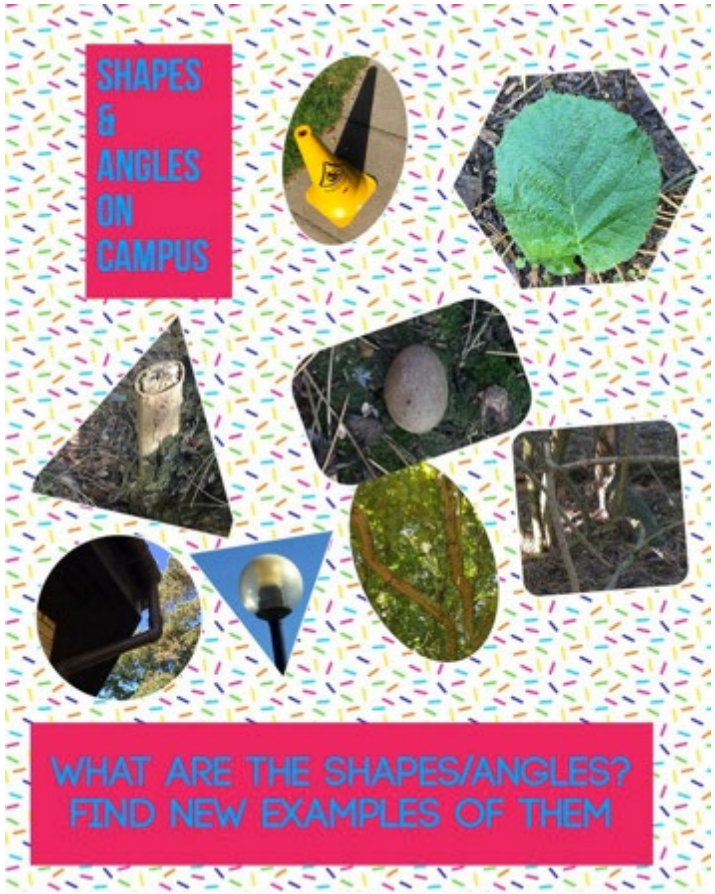
...building bridges with others through art

Creating trails



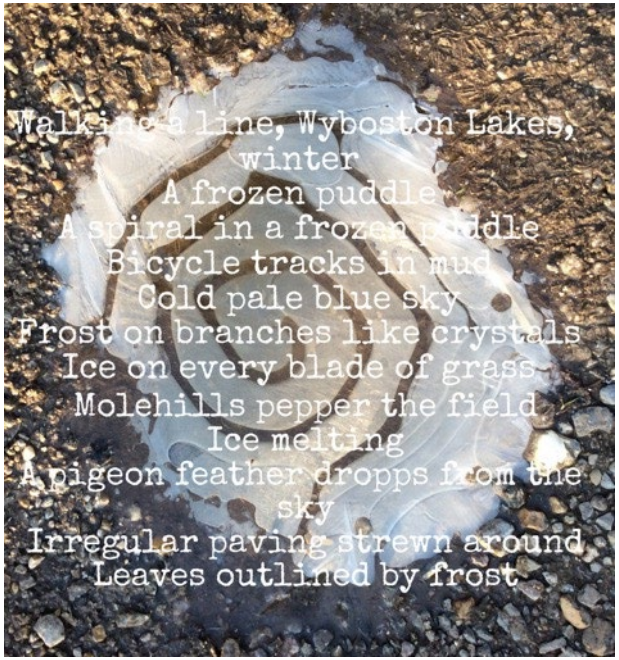
…combining digital and physical exploration

I am the pencil

i

…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

http://www.richardlong.org

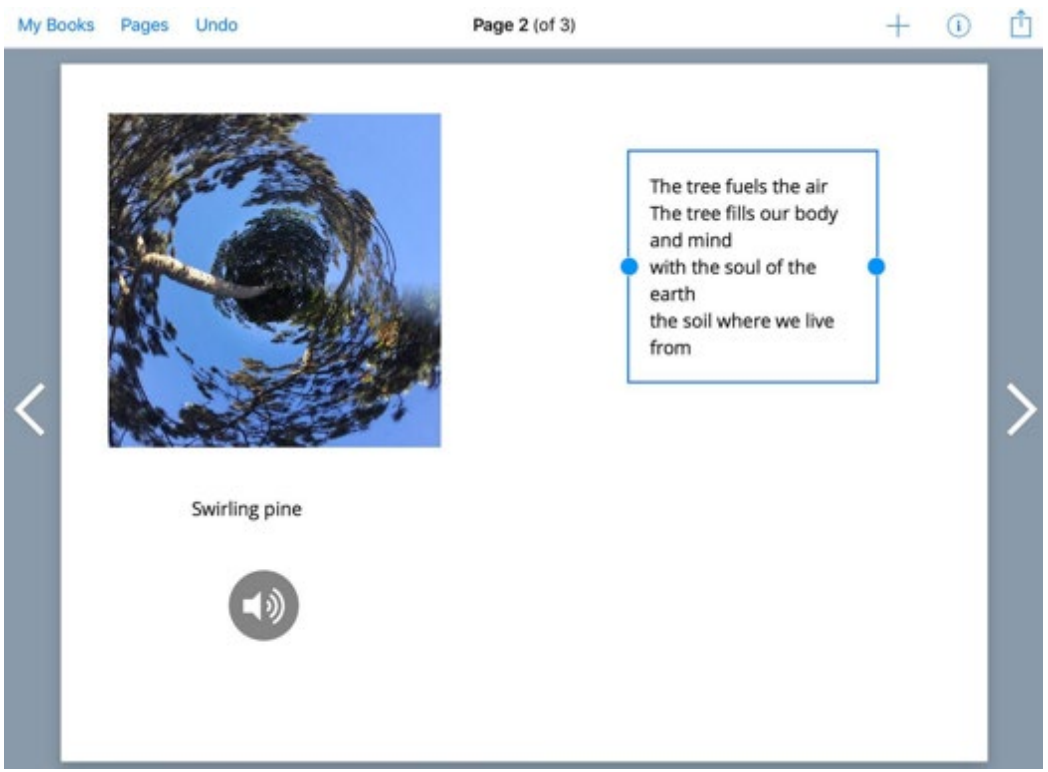
…photo-journeys inspiring writing

Wild writing

The secret life of the outdoors

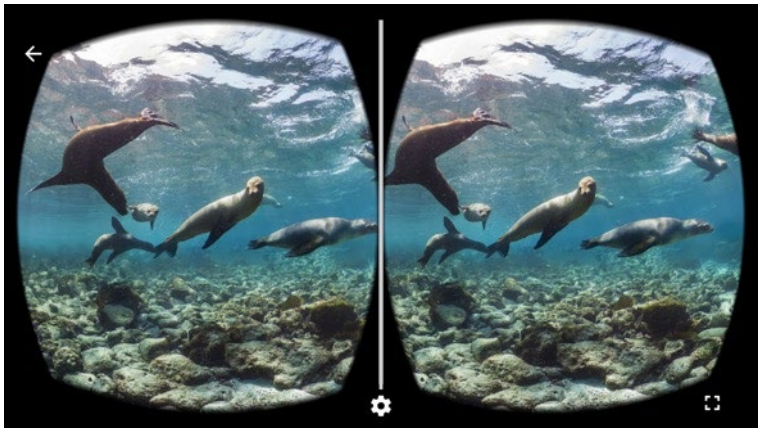
…mobiles capturing outdoor learning

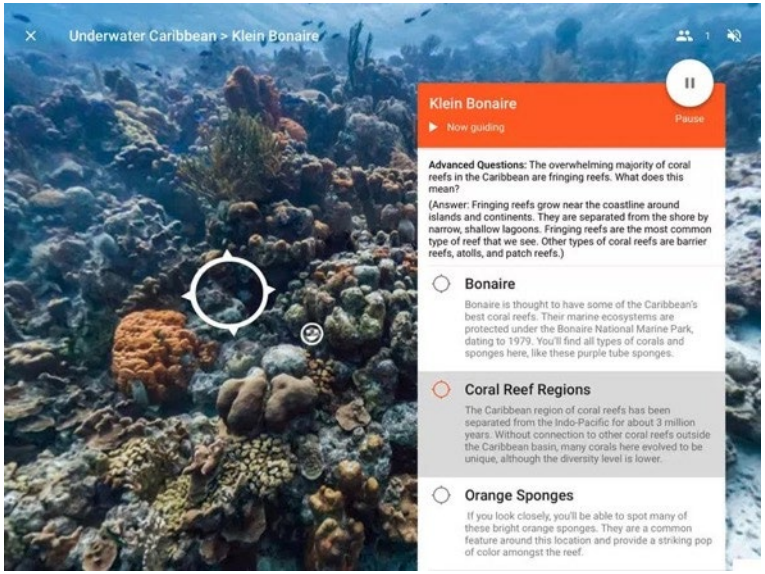
Wild writing



…manipulating images and viewpoints

Bringing the outside in





...AR and VR merging real and virtual worlds

Manipulating media

…from green screening to VR 360 as a creative medium

Technology supporting SEND

Apps:
- Rollworld
- Fragment
- Be Funky

…working with light

Digital meets physical

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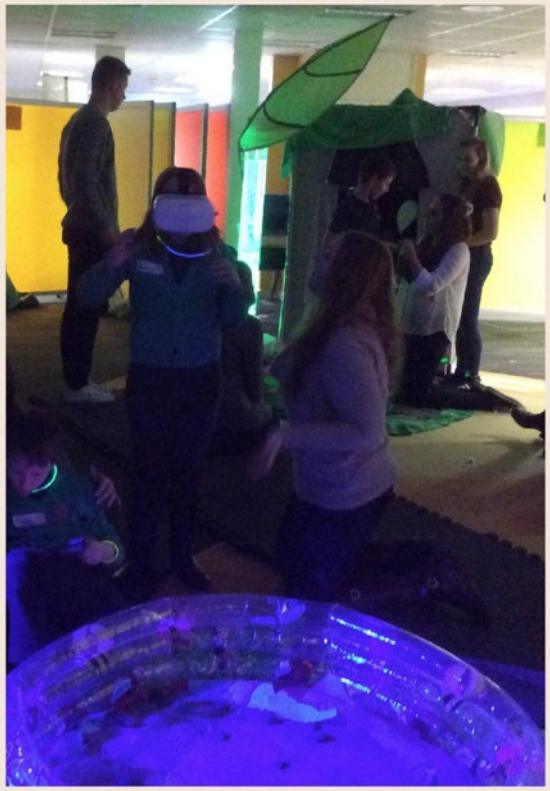
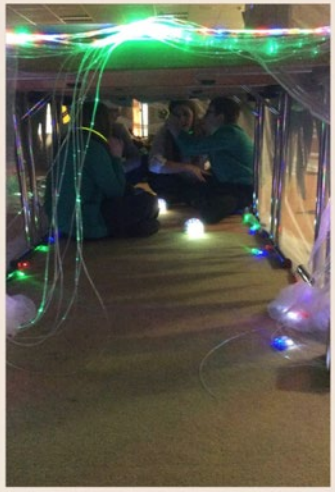
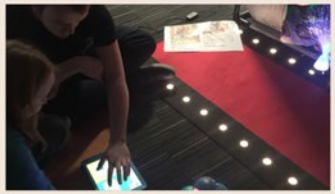
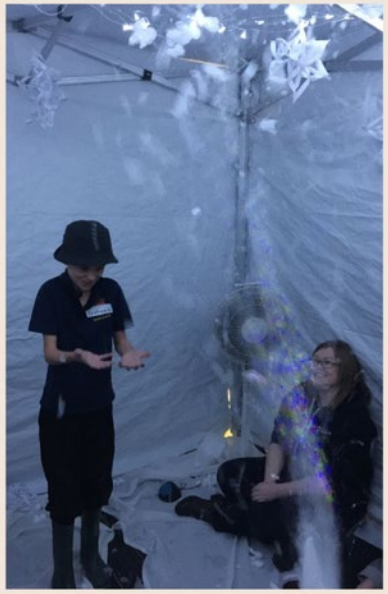
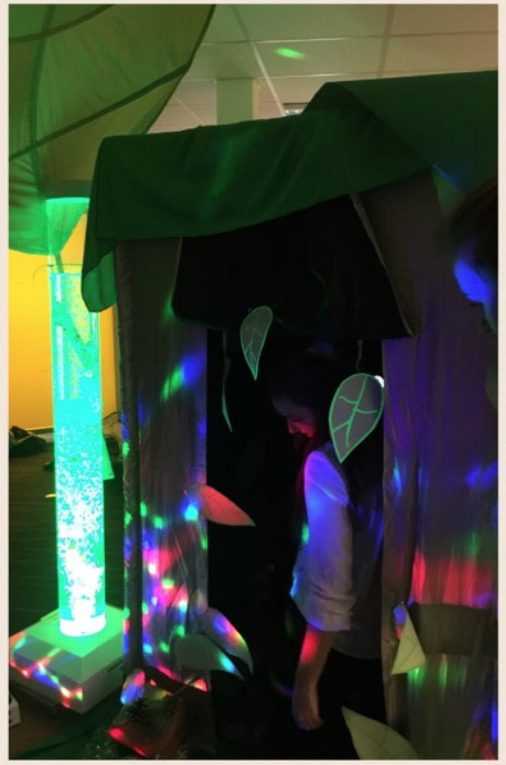
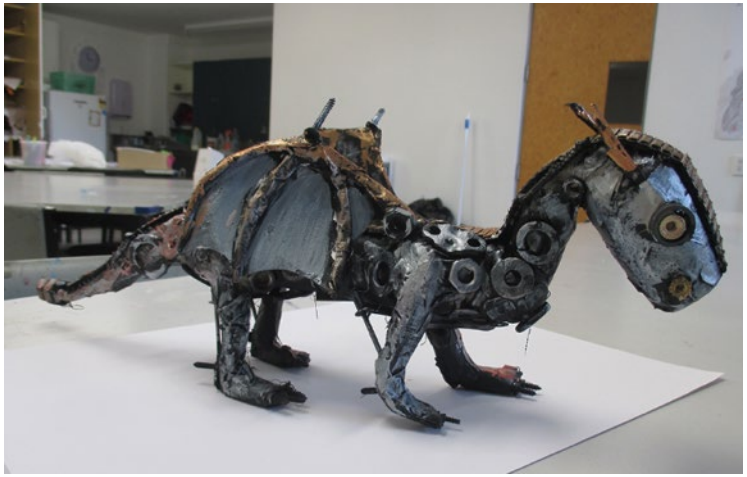




…moving between digital and physical spaces

Exploring STEAM



Digital Learning across Boundaries through adding the Arts to STEM

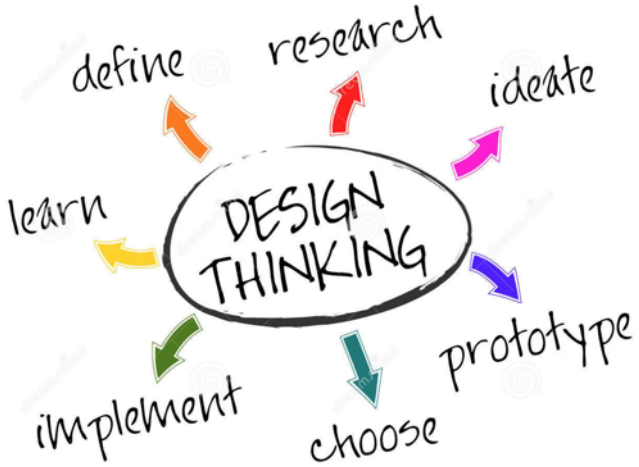
A DLaB STEAM activity uses digital technologies to cross boundaries by adding the arts into STEM and providing opportunities to build intercultural connections.

STEAM weeks

http://bridgewaterprimary.net/blogs/y5/2017/06/05/steam-week-2017-monday/
Thomas's Clapham STEAM week

STEAM with 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

Overlapping arts:

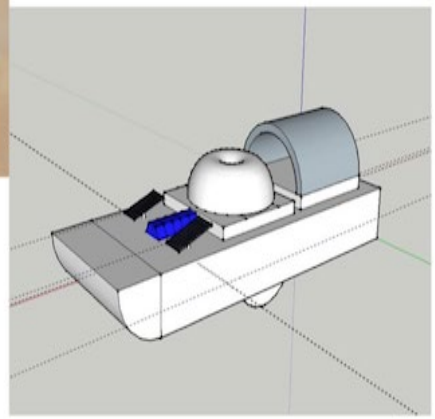
1.Visual art, drawing, painting, printmaking, collage, photography, textiles, sculpture, installation, digital arts, graffiti
2.Music and sounds, sound art, spoken word
3.Drama, performance, dance, spoken word
4.Literature, poetry, written text, sci fi, comics

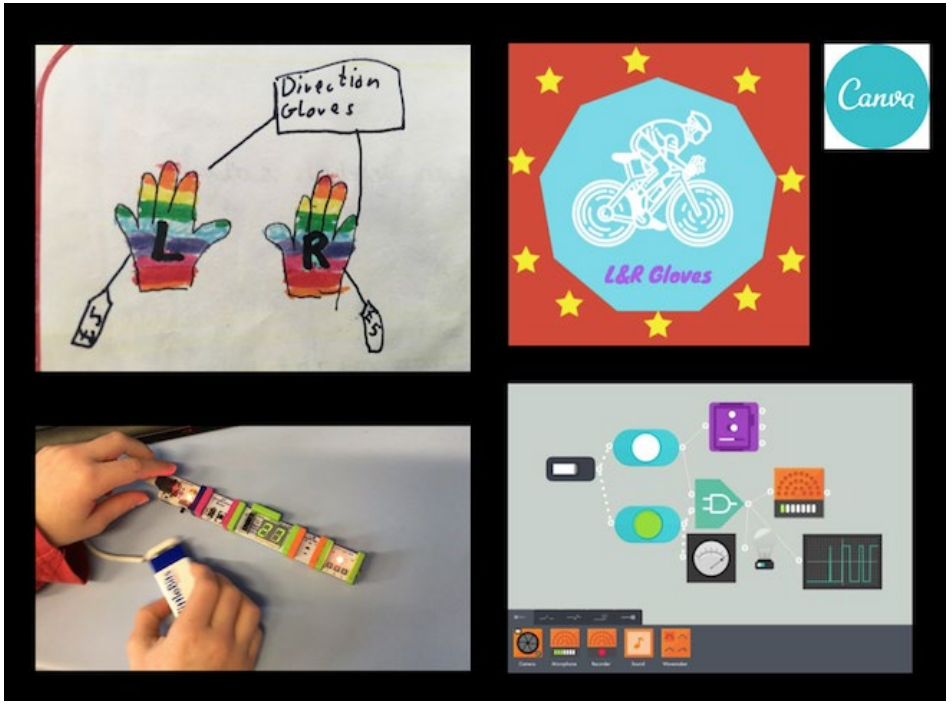
The Sea Dog

A robotic dog that swims and collects rubbish from the ocean

The Solar Sea Sweeper

A solar-powered water vehicle that collects and compacts waste





…tinkering, making and inventing

Makerspaces and breakerspaces

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http://www.makerspaceforeducation.com/breaker-space.html

…deconstructing technology

Wearables and the Internet of Things

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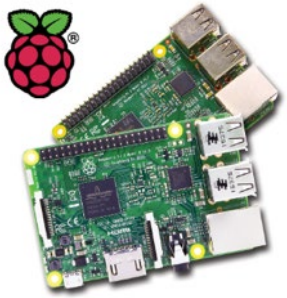
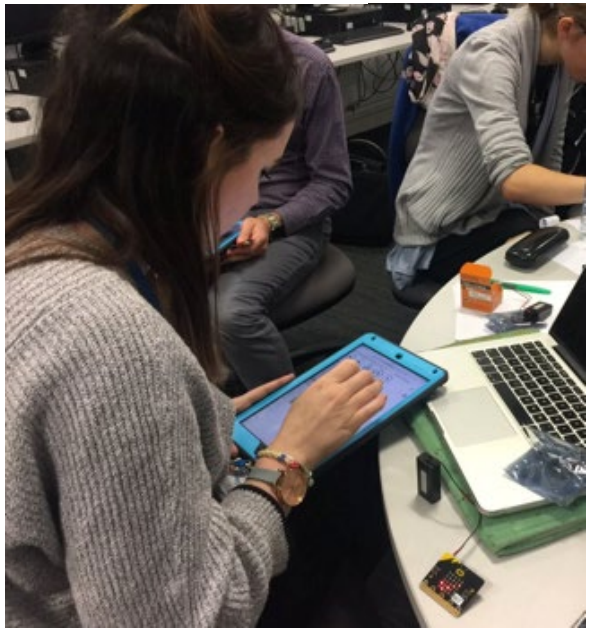


micro:bit



…inspired by computing and performance

Technology transforming learning

…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

…recent background

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@helencaldwel

Links

DLaB community
http://bit.ly/DLaBErasmus
DLaB website
http://dlaberasmus.eu/