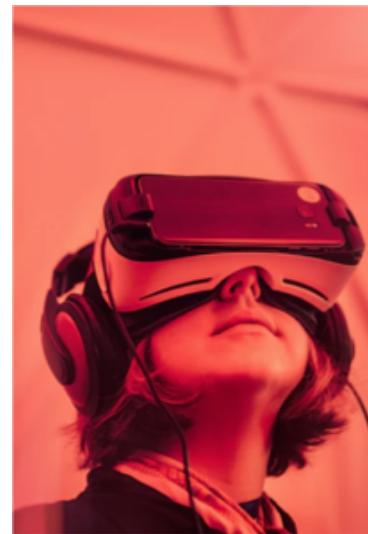


Technology to understand and change the world La technologie pour comprendre et faire évoluer le monde

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



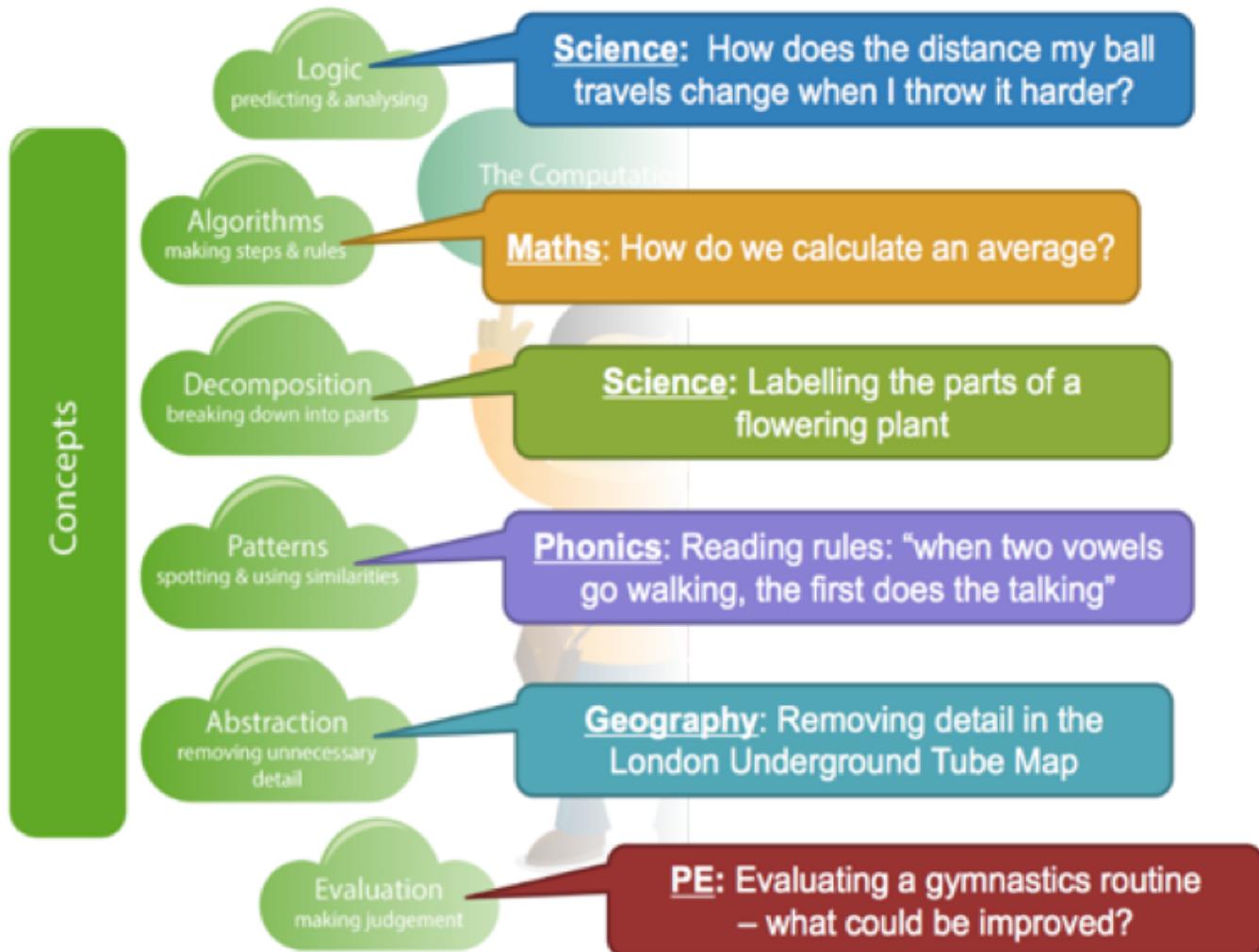
Barefoot would like to acknowledge the work of Julia Briggs and the eLM team at Somerset County Council for their contribution to this poster.

...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



Build repertoire rather than recipes

Construire du répertoire et pas des recettes

UPTIME

Use
Play
Tinker
Improve
Make
Evaluate

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

Chris Shelton University of
Chichester



The screenshot shows the Scratch website homepage. At the top, there's a navigation bar with links for 'Create', 'Explore', 'Discuss', 'About', 'Help', 'Search', 'Join Scratch', and 'Sign In'. Below the navigation, there's a main banner with the text 'Create stories, games, and animations Share with others around the world' and three icons: a cat-like sprite with a green button labeled 'TRY IT OUT!', a blue cat-like sprite with a pink button labeled 'SEE EXAMPLES', and a yellow star-like sprite with a blue button labeled 'JOIN SCRATCH (It's free!)'. To the right of the banner is a preview of a Scratch script titled 'Welcome to Scratch' which plays a sound and changes the stage background. Below the banner, it says 'A creative learning community with 18,276,974 projects shared' and links for 'ABOUT SCRATCH | FOR EDUCATORS | FOR PARENTS'. The main content area is divided into sections: 'Featured Projects' (with thumbnails for 'How to use [Scratch logo]', 'barrier-grid animator', 'Eye Cube', 'Virtual Photosynthesizer', and 'Mona Lisa Equation'), 'Featured Studios' (with thumbnails for 'Mouse Trails', 'Songs Made In Scratch', 'Scratchers Around The V', 'Lyrics Taken Literally', and 'o-Learn'), and a large central area showing a preview of a Scratch project.

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.

Computing unplugged

Le numérique – loin de l'écran

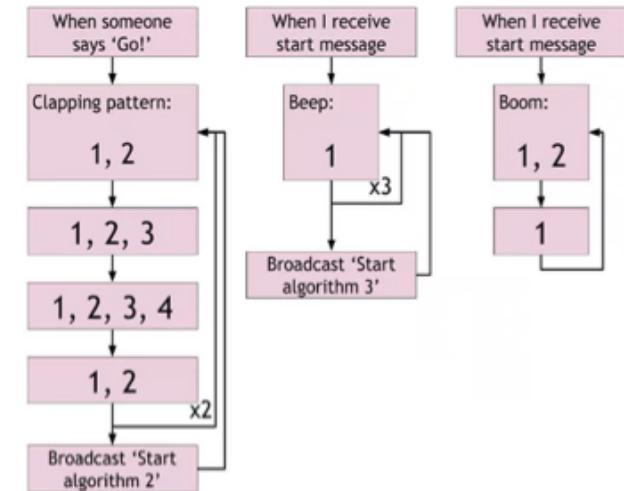
Teaching computing? Try switching off your screens

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

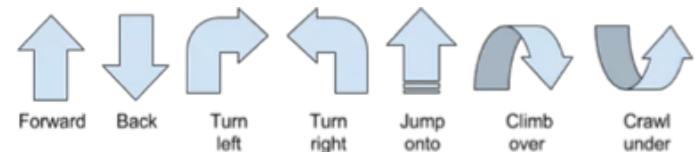


Moving away from computers can often help students understand ideas behind programming without being distracted by the technology. Photograph: Alamy

Human beatbox



Robot hamster playground



Everyday algorithms

Les algorythms 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



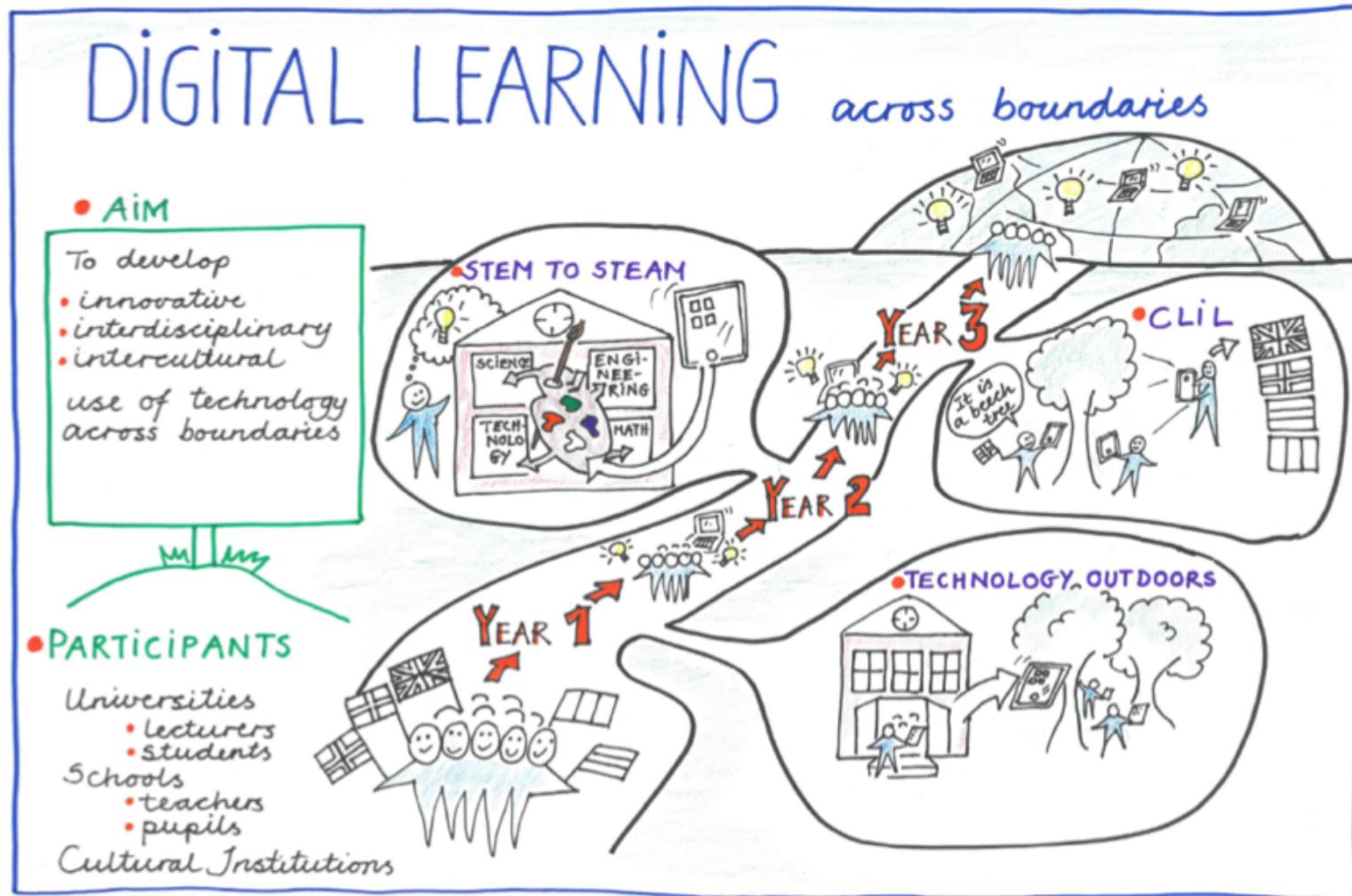
...time for tinkering and experimenting

Rescue Robots



...real world applications

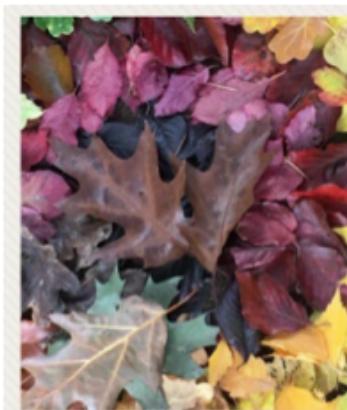
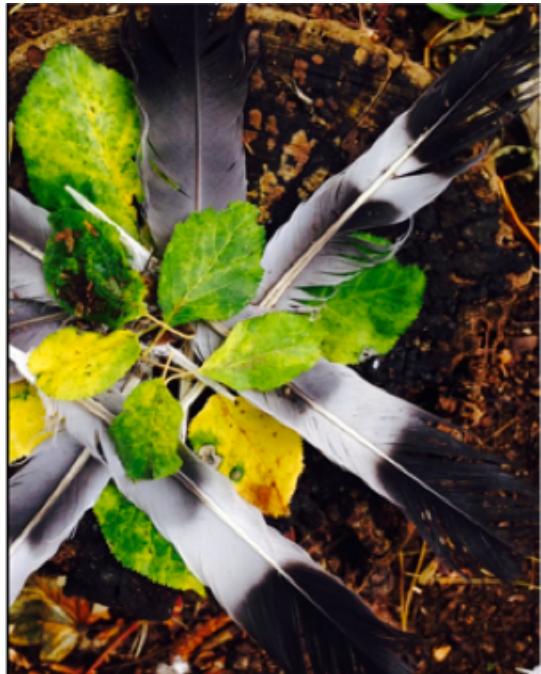
Erasmus+ and eTwinning



<http://dlaberasmus.eu/>

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

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

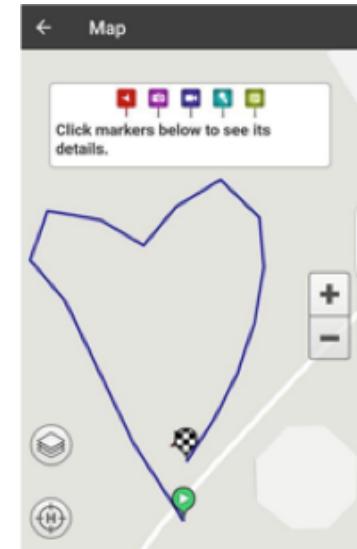
Virtual sculptures



#virtualsculptures

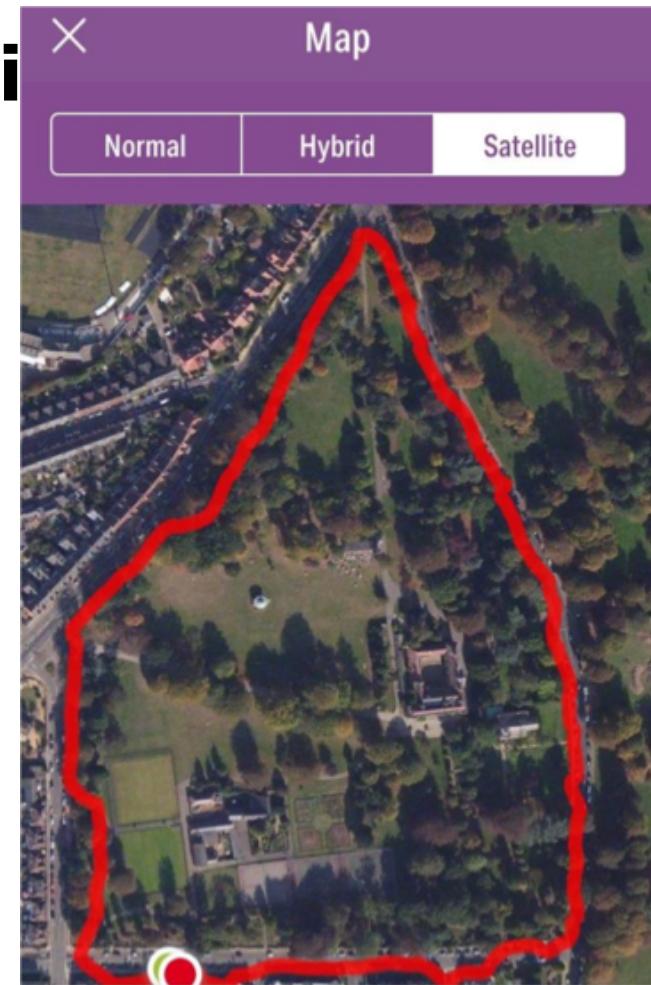
...building bridges with others through art

Creating trails



...combining digital and physical exploration

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?



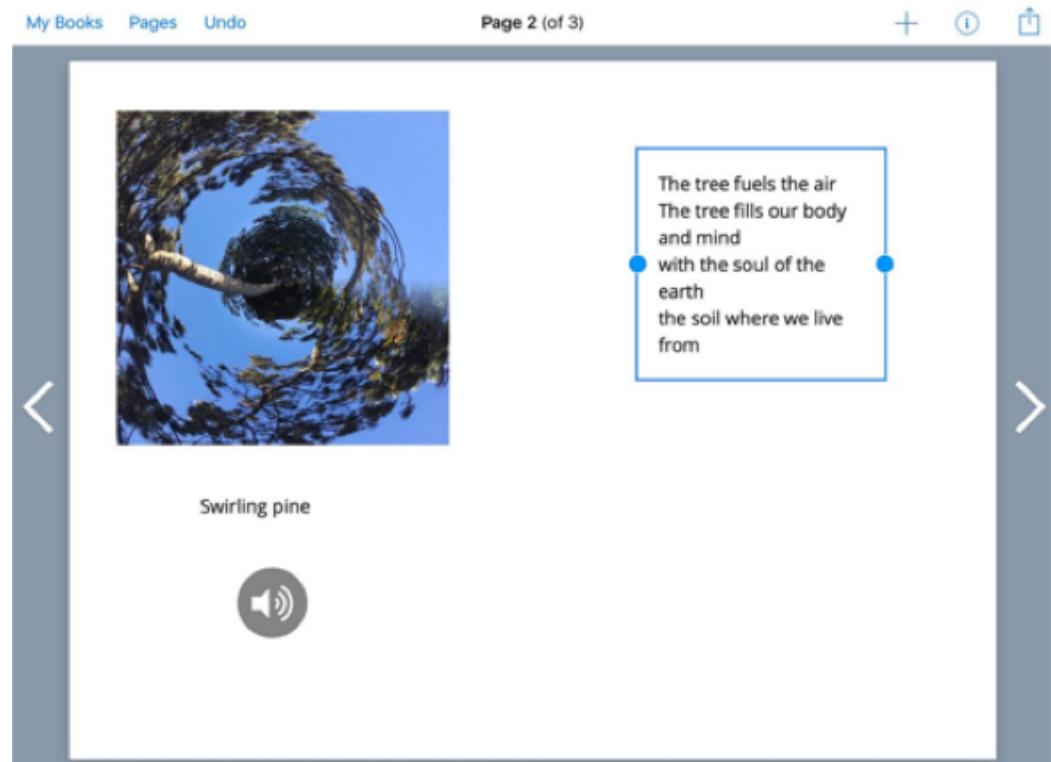
The secret
life of the
outdoors



Wild writing



My Books Pages Undo Page 2 (of 3) + ⓘ ⌂

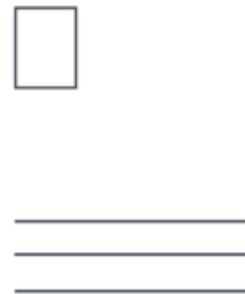
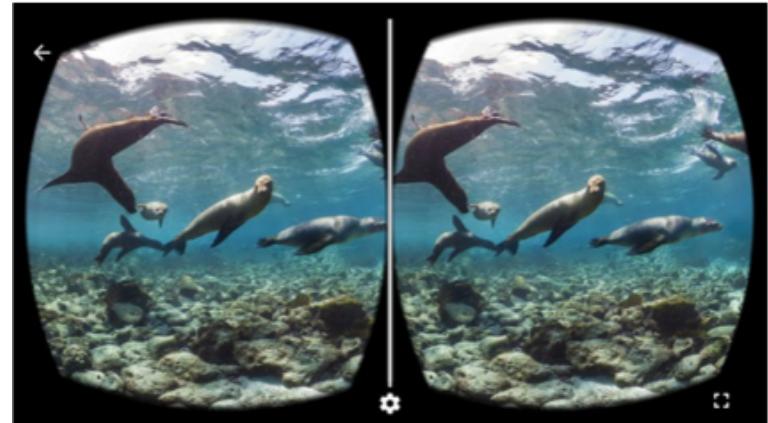


Swirling pine

The tree fuels the air
The tree fills our body
and mind
with the soul of the
earth
the soil where we live
from

...manipulating images and viewpoints

Bringing the outside in – faire rentrer le monde



Klein Bonaire

Now playing

Advanced Questions: The overwhelming majority of coral reefs in the Caribbean are fringing reefs. What does this mean?

(Answer: Fringing reefs grow near the coastline around islands and continents. They are separated from the shore by narrow channels. Fringing reefs are the most common type of reef that we see. Other types of coral reefs are barrier reefs, atolls, and patch reefs.)

Bonaire

Bonaire is thought to have some of the Caribbean's best coral reefs. Their marine ecosystems are protected under the Bonaire National Marine Park, dating to 1979. You'll find all types of corals and sponges here, like these purple tube sponges.

Coral Reef Regions

The Caribbean region of coral reefs has been separated from the Indo-Pacific for about 3 million years. Without connection to other coral reefs outside the Caribbean basin, many corals here evolved to be unique, although the diversity level is lower.

Orange Sponges

If you look closely, you'll be able to spot many of these bright orange sponges. They are a common feature around this location and provide a striking pop of color amongst the reef.

...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

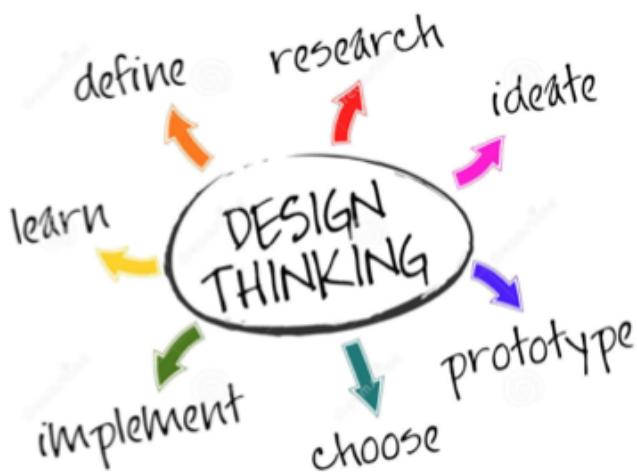
A DLaB STEAM activity uses digital technologies to cross boundaries by adding the arts into STEM and providing opportunities to build intercultural connections.

STEAM weeks – des semaines 'STEAM'



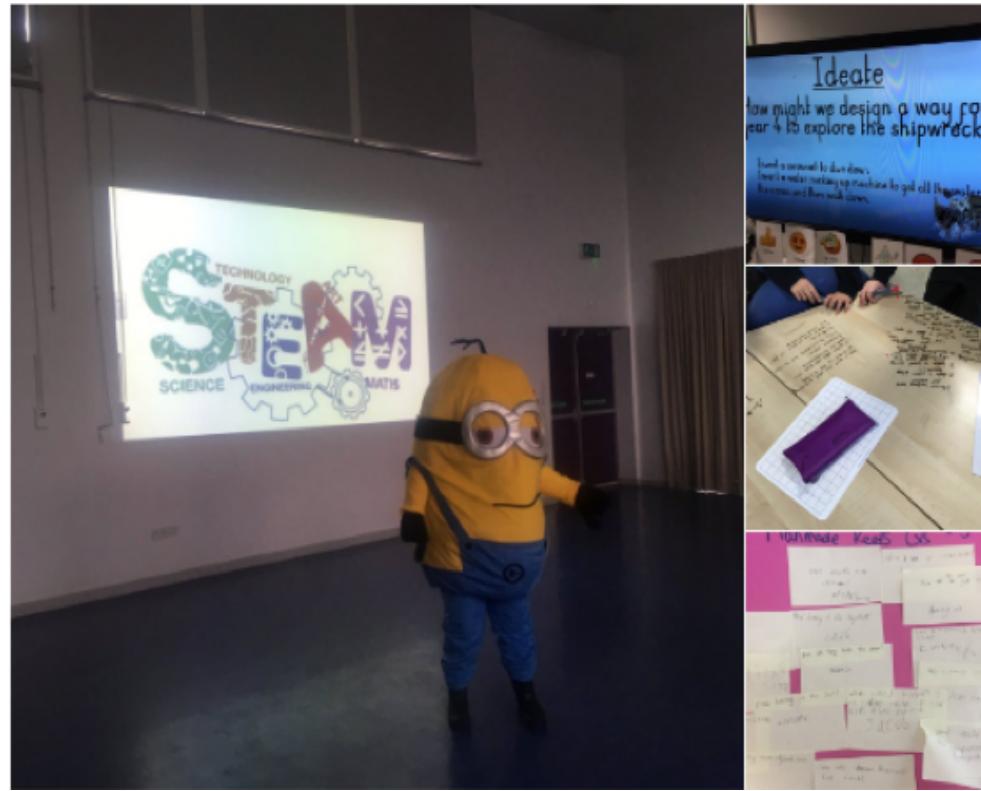
STEAM with Design Thinking

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

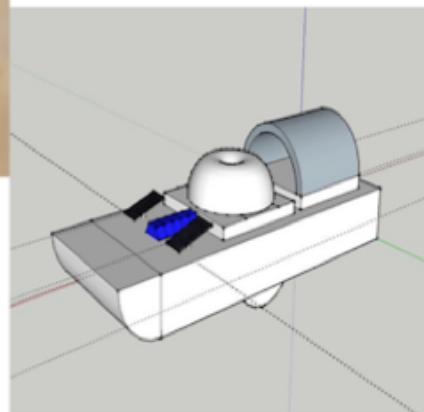
Overlapping arts:

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 Sea Dog

A robotic dog that swims and collects rubbish from the ocean



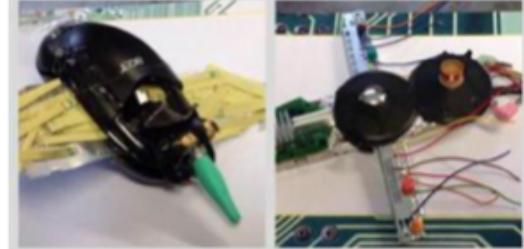
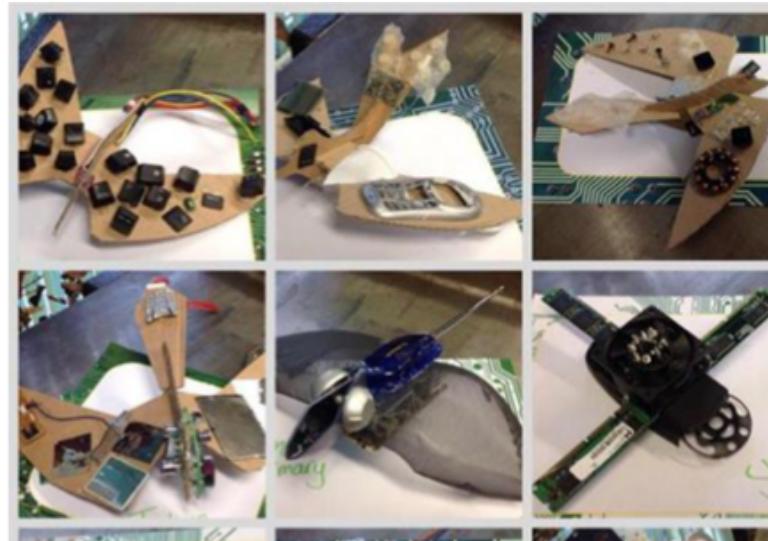
The Sea Dog

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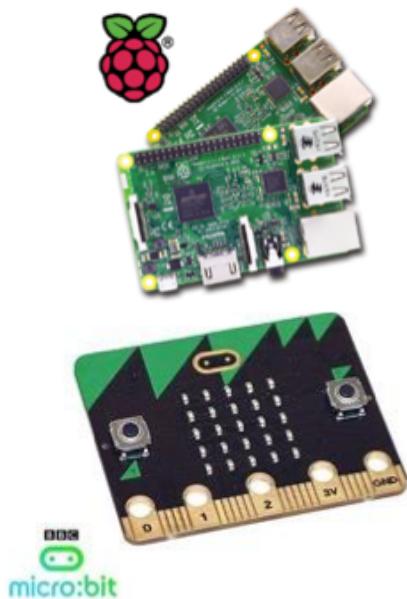


...tinkering, making and inventing

Makerspaces and breakerspaces



Wearables and the Internet of Things



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



Technology transforming learning

La technology qui transforme l'apprentissage



creative,
self-directed
learners
collaborating
and sharing
content

...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

Contact

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[@helencaldwel](https://twitter.com/helencaldwel)

Links

DLaB community

<http://bit.ly/DLaBERasmus>

DLaB website

<http://dlaberasmus.eu/>