

CODING IS THE NEW LITERACY TO MAKE A DIFFERENCE IN THE WORLD

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Coding is the new literacy



Every day objects are made with code, yet most of us do not know how to read and write code.
Code is the language we use to talk to computers.

Successful coders started early

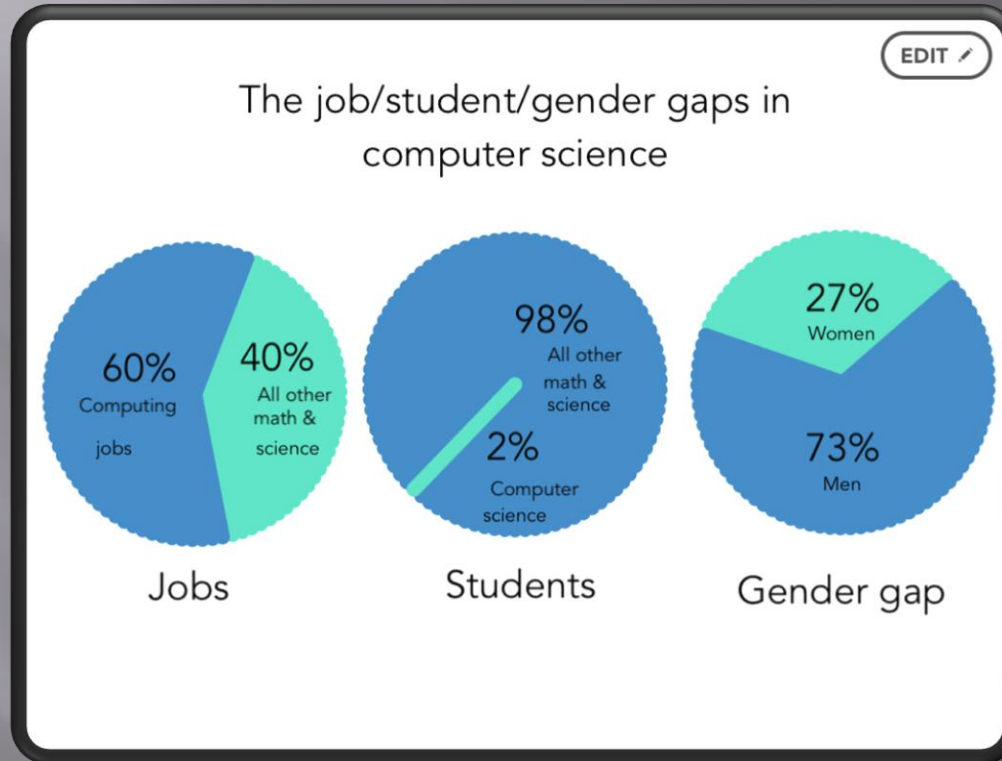


i.e. Steve Wozniak, Bill Gates, Mark Zuckerberg, Larry Page, Serguey Brin

They were surrounded by computers at an early age.

They had access to coding. They were aware of possibilities at an early age.

Prospects



Many computer-related jobs go unfilled.
We are missing so many students studying computer science.
There is a place for more women in the field.

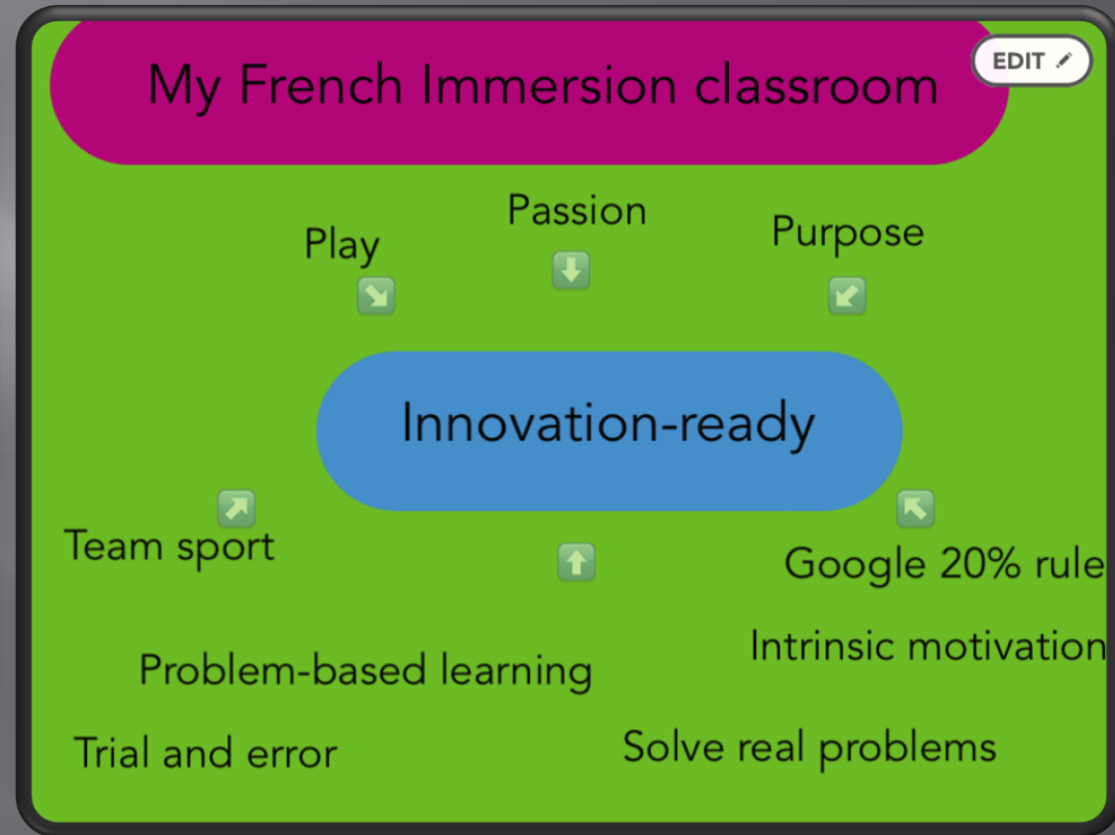
Remove barriers



Start coding in Kindergarten. Children will see coding, rightfully, as play. The new Scratch JR works well in K -2 while grade 2-6 students can use Hopscotch on the iPad. Grade 6 students and up can use Scratch and the Raspberry Pi. Those apps provide an excellent scaffold for the budding coder.

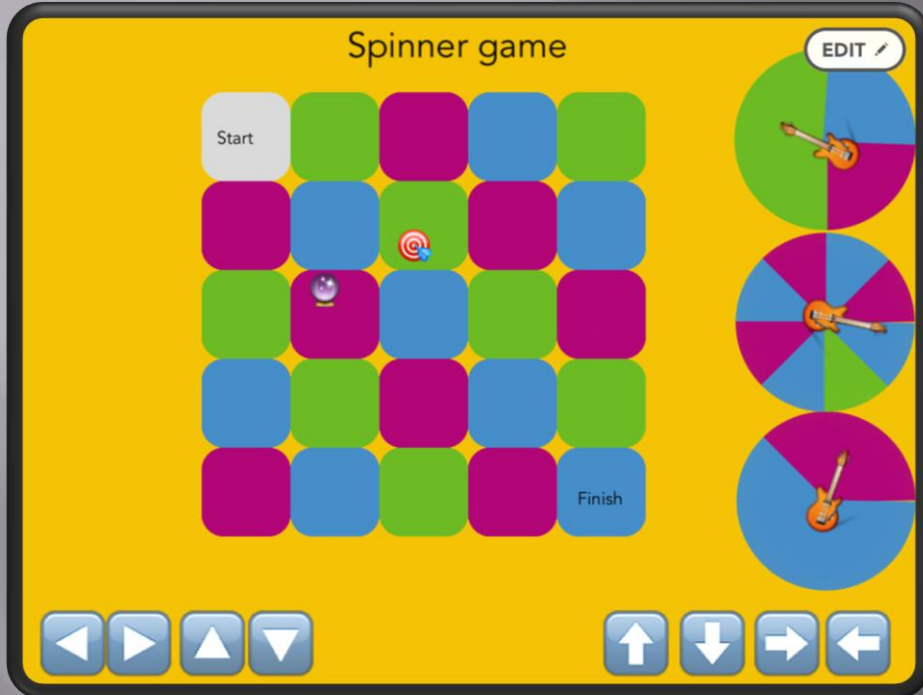
By starting early, children will build positive self-concepts towards coding instead of the negative ones of geek, nerds and so on that prevent many people from joining an innovative field.

Vision



Modelled my classroom following Tony Wagner:
First Innovation Education fellow at the Technology & Entrepreneur Center
at Harvard University.

Vision: play



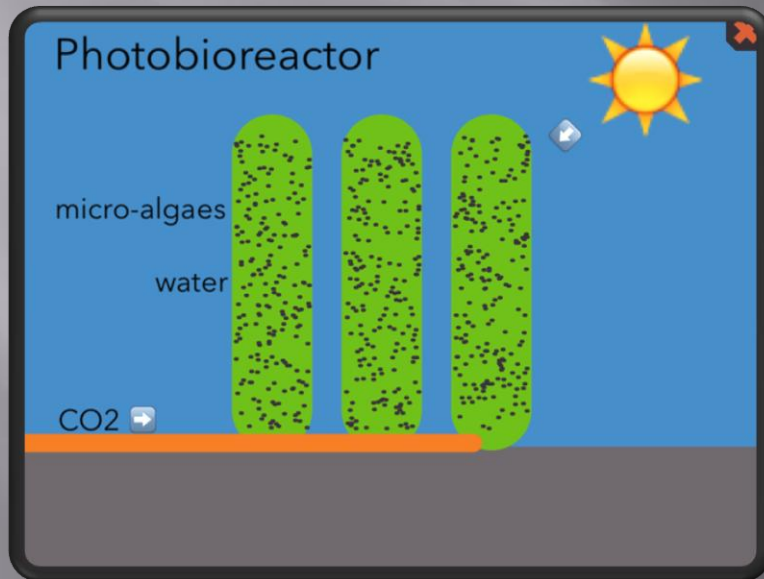
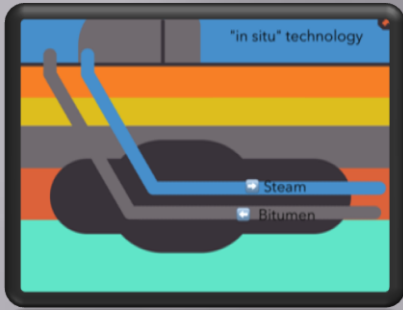
Coding feels like playing a game.

Children will happily code at home, at school, or in computer clubs.

In addition to playing video games at home, coders create video games for fun.

Source: Nelson Mathematics 4

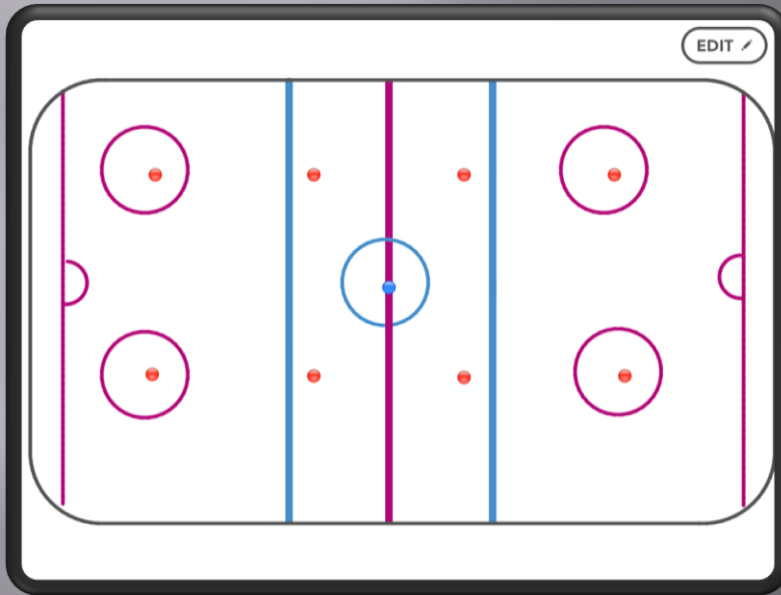
Vision: passion



Students and teachers code about what is important to them, what they are passionate about like modelling solutions to the problem of global warming. Here we have alternative ways to produce petroleum.

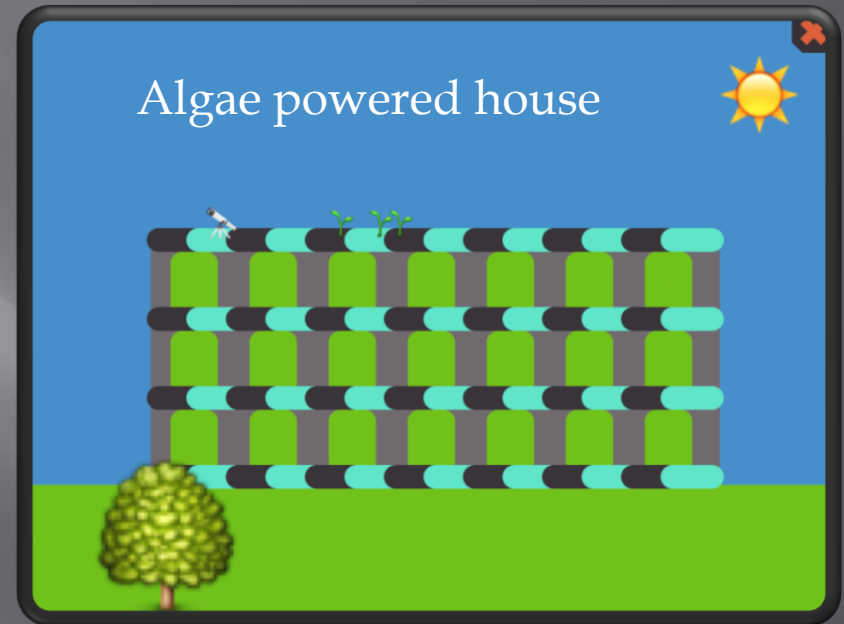
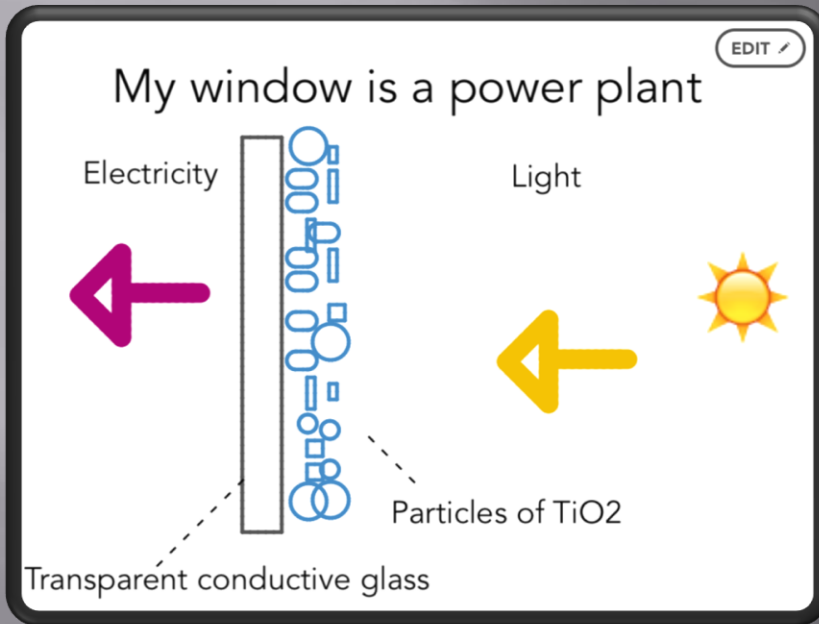
Source: Inside Education, Earthrise from AlJazeera

Culture: team sport



Apart from being very athletic and competitive, coders work together with their peers, their mentors, their community, the media in order to be innovative. Their work is interdisciplinary.

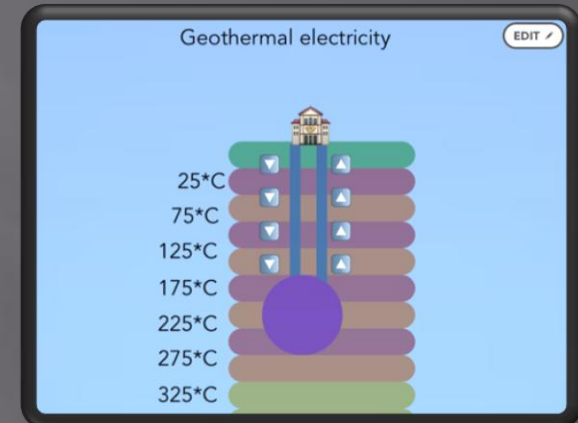
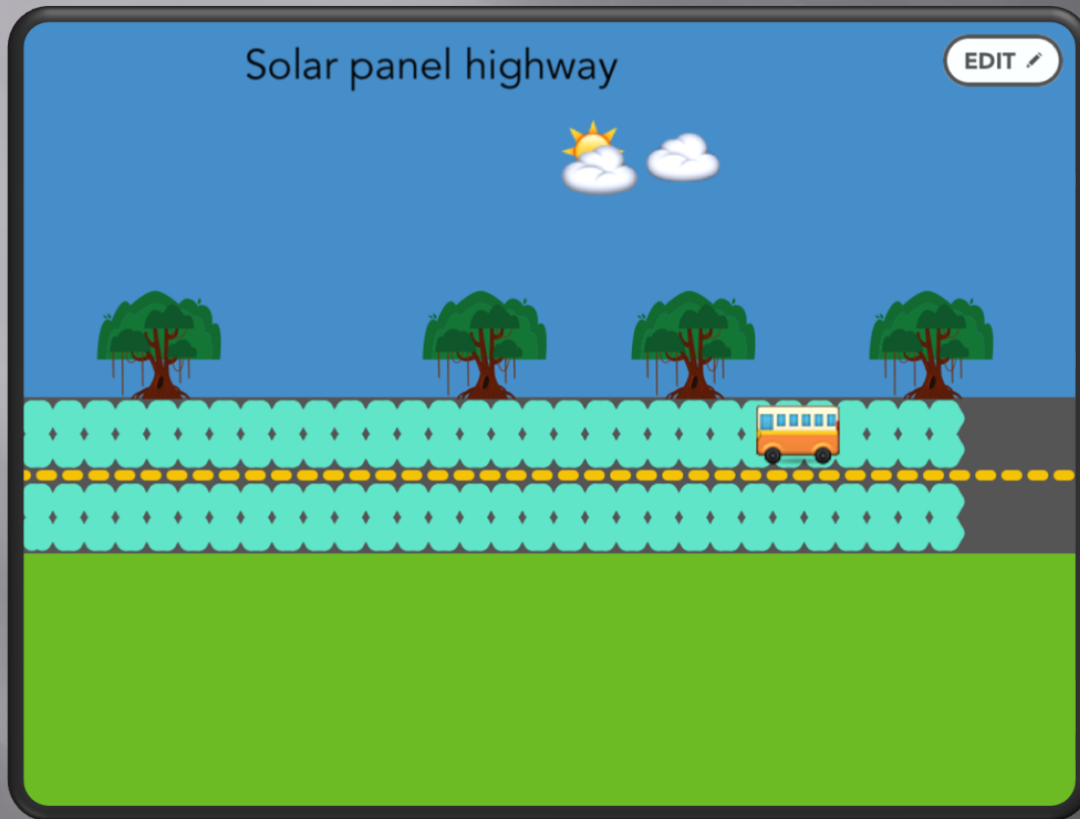
Vision: purpose



Students code because they know it is important and they can use their skills and ideas for a greater purpose like sustainable development.

Source: Radio-Canada – Années Lumières, AlJazeera.

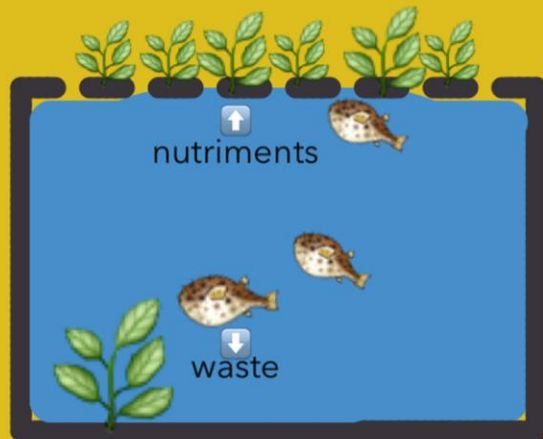
Culture: problem-based learning



Innovators identify problems, understand them to drive their learning. For example, addressing global warming and finding workable solutions are big problems of our societies. Source: Time for Kids

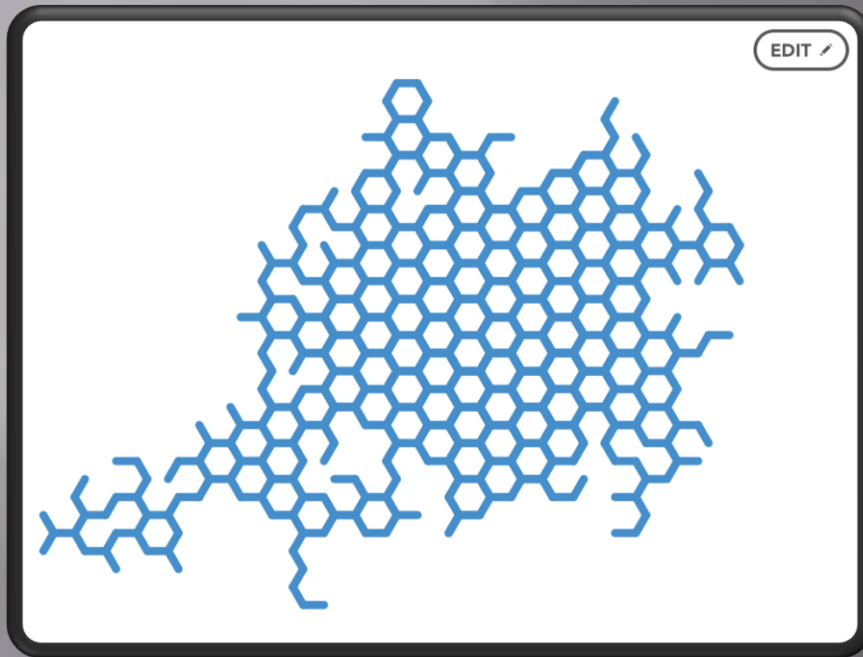
Culture: solve real life problems

Urban aquaponics- how it works



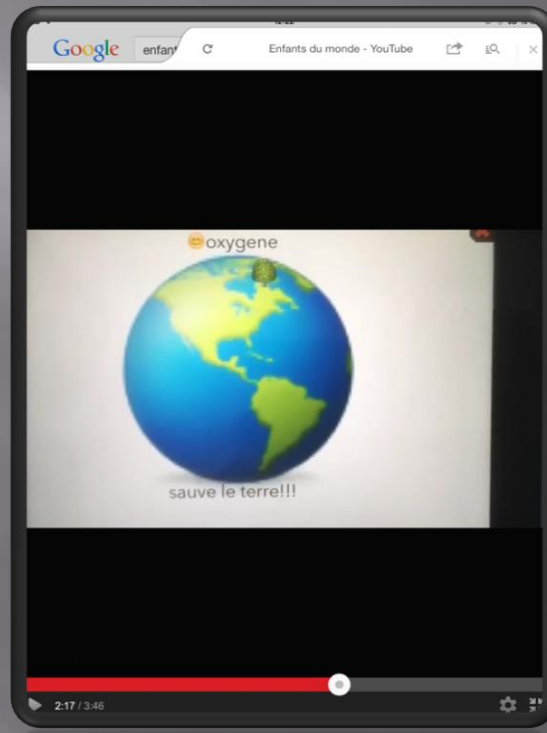
To be effective, innovators need to be rooted in reality, to offer real solutions to real life problems. Here we see a different way to grow food for the growing population of the Earth. Also, bring an awareness that emotional intelligence is one of the best predictor of later success.

Culture: trial and error



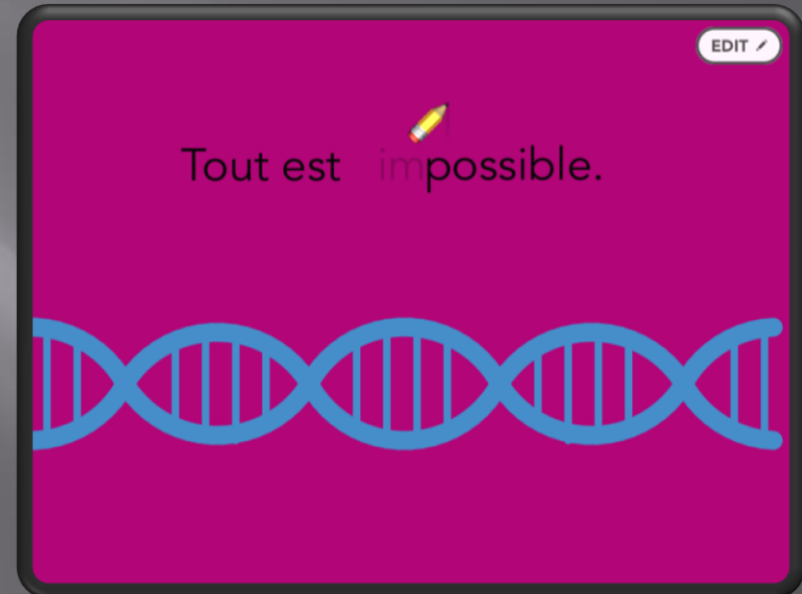
Coding is trial and error. It is very easy. Draw a line, turn, and repeat. Further projects develop from there. With students starting early, they intuitively learn how to code through play and practice. The online community also provides support by sharing many examples of programs and ideas on how to code.

Culture: create real products for real audiences



For example, students created French audio books for younger students that were published online on YouTube. Videos with songs were also published on YouTube for Earth Day awareness. Others about how they like to code.

Culture: intrinsic motivation



Students create products of their choice, and not necessarily teacher-directed. My students were against bullying. With the school, they organized a march for the Day of Pink. I gave them the opportunity to publicise their work before hand. Others are intrinsically motivated by poetry.

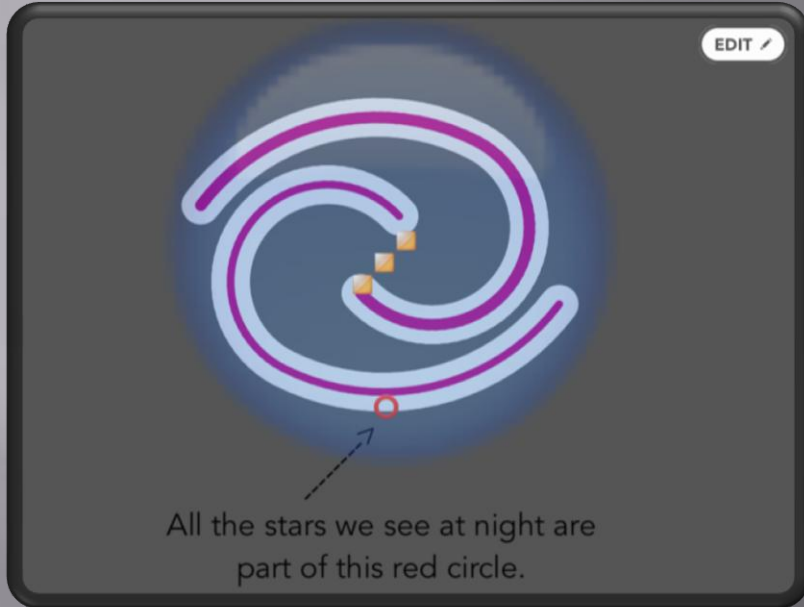
Google 20% rule



Google derive their success from their 20% rule. Employees “work” 80% of the time and use one day of the week (20%) to do whatever they want. Their most innovative products came from the 20% of time employees were allowed to be creative and work on what they wanted.

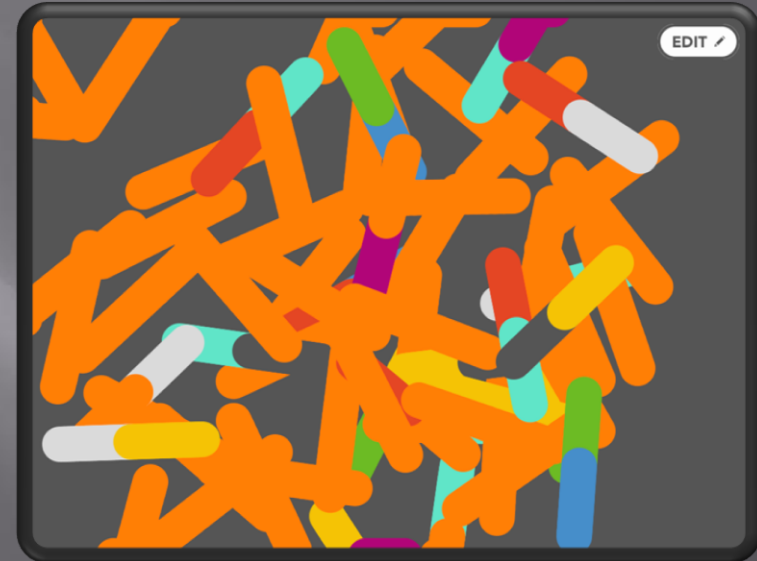
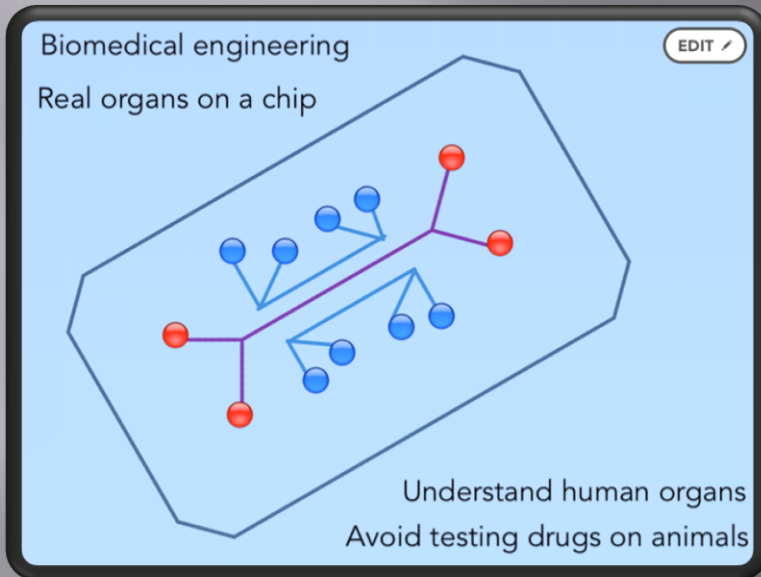
In my classroom, we followed a similar pattern. One morning every two weeks, students were allowed to code to create something amazing. This is how they became coders. They started by creating one line programs at the beginning of the school year to being able to code their own video games in the last week of school.

Curious



Students remain naturally curious. They investigate what interests them, like space exploration and the benefits of space exploration.
Source: Science et vie Junior

Imaginative

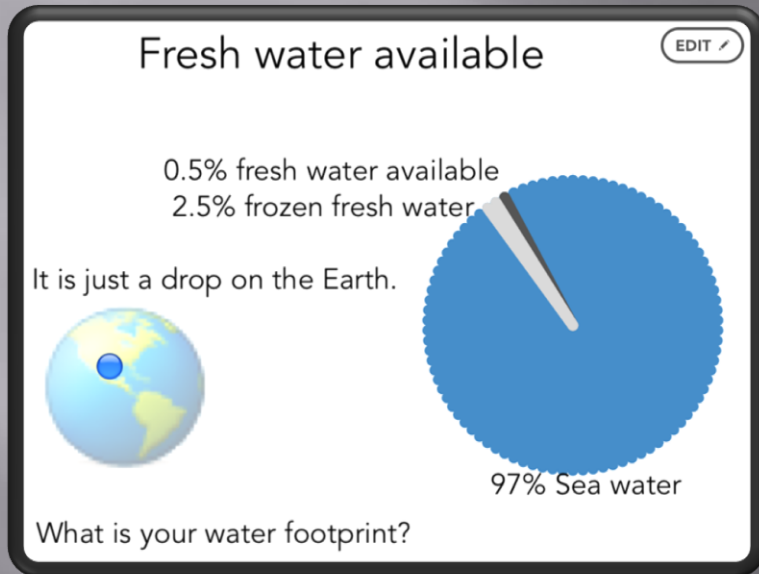


Students are imaginative and they model themselves after leading innovators by following in their footsteps from biomedical engineering to paleontology.

Source: WISE initiative; Channel Explora

Learning 24/7, everywhere

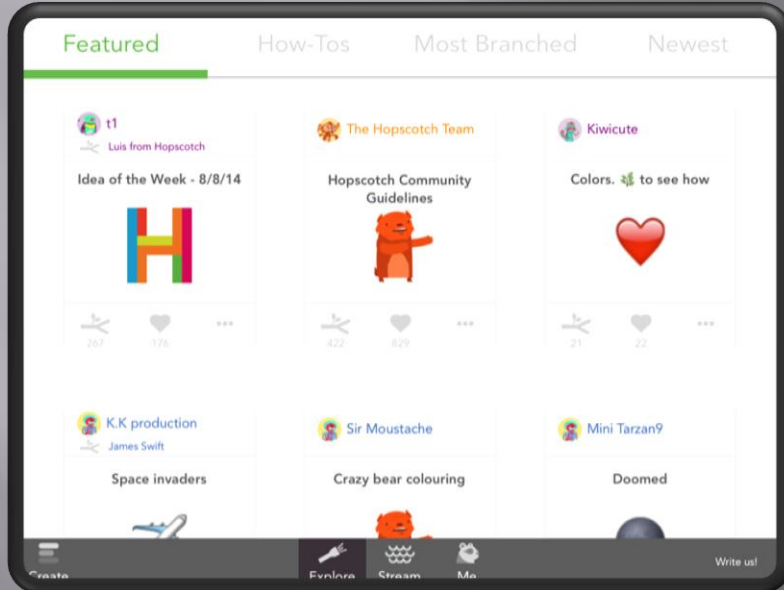
Exploration games



Students learn and work everywhere: at home, at the museums, outside, with books, online, on television. Learning is no longer limited to the classroom. Many students had their own devices and coded at home, just because it was fun.

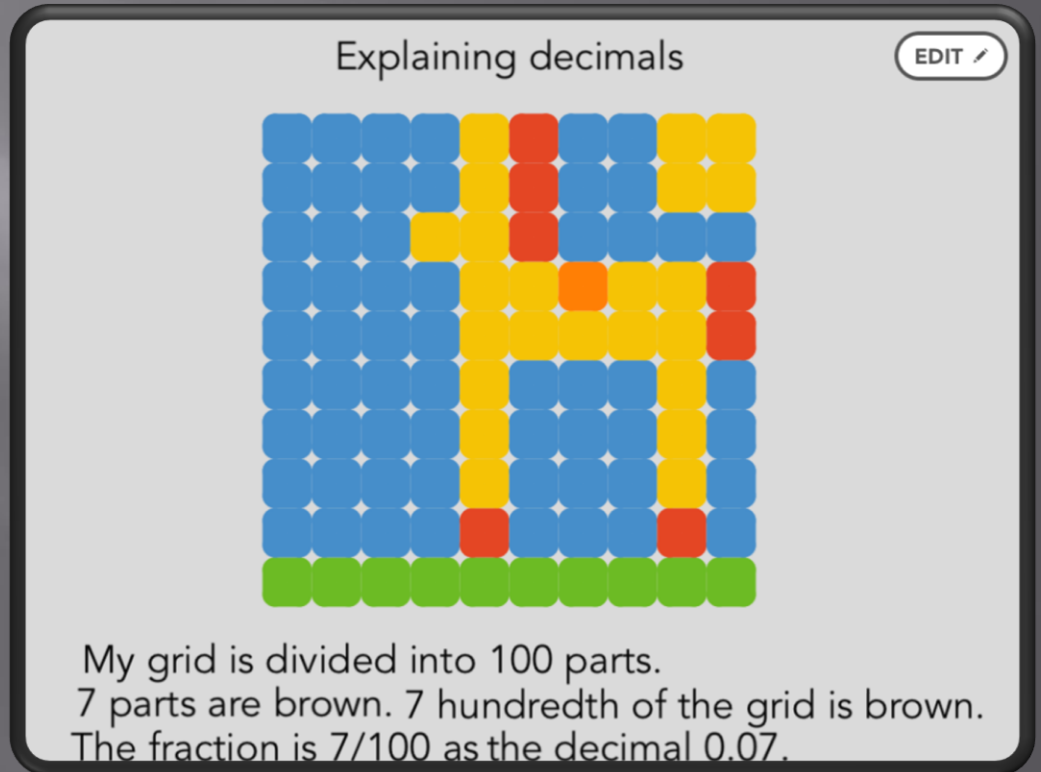
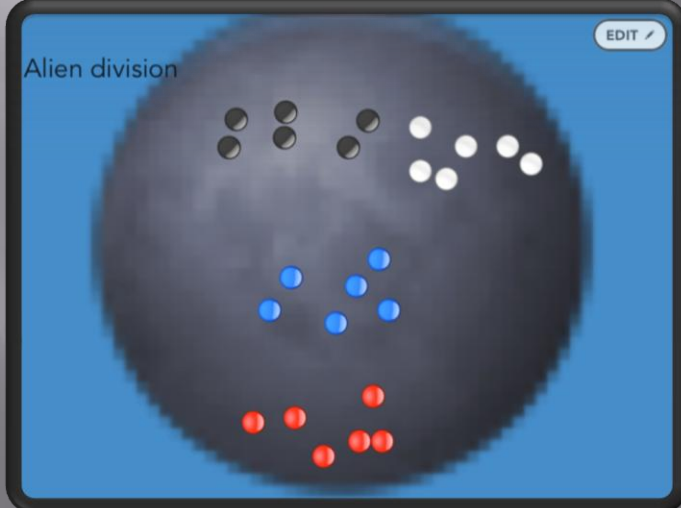
Canadian Museum of Nature; Canadian Museum of Civilization

Online communication




Both adults and students model programs on the online community. A French Immersion grade 3 student is modeling a history timeline. It has been featured by Hopscotch.

Math becomes fun

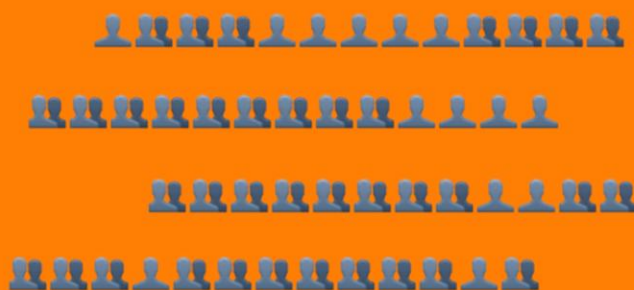



Coding can use many math concepts. Fractions and percents are visual.
Source: Eyes on Math; Nelson Mathematics 4.


Make a difference in the world

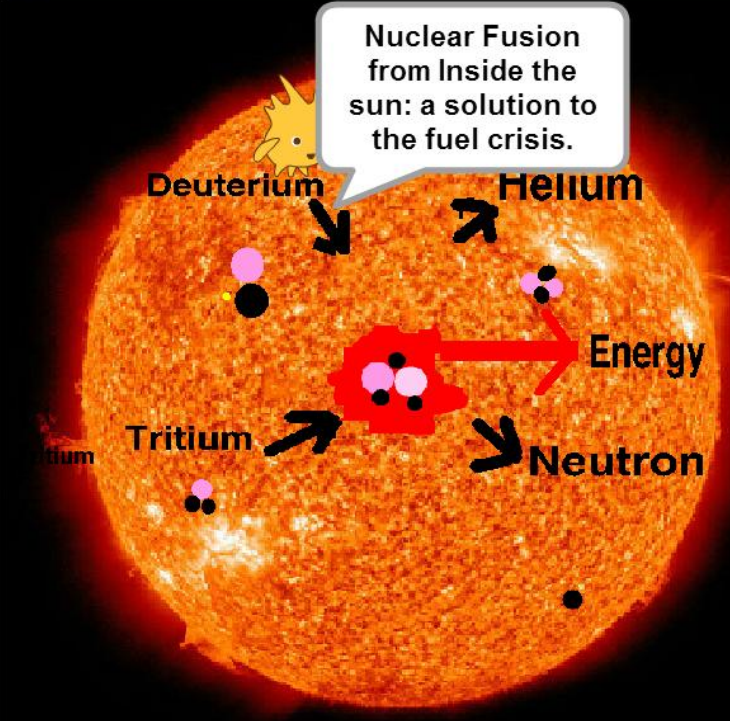
We have more Black men in prison today that were under slavery in 1850.



They need a different future.



Nuclear Fusion from Inside the sun: a solution to the fuel crisis.



Deuterium

Helium

Energy

Tritium

Neutron

What is important to you?

Role Models: Toronto startups



CEO: Leila Boujnane

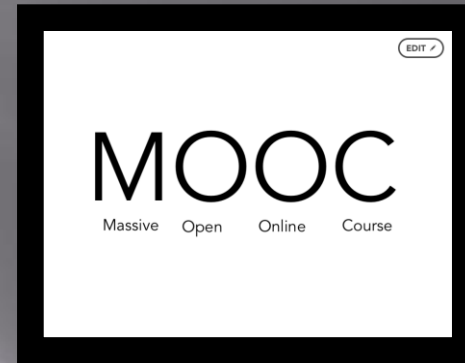


CEO: Allen Lau

Toronto has many startup companies that provide inspiration and leadership. For example, TinEye is an image search engine that allows anyone to search the web for other locations where the image provided is used. Wattpad is a site where anyone can go to read free books and publish their own books.

Source: CBC MetroMorning.

To go further



It does not matter where you are from in the world or the color of your skin, your gender, your age, or what makes you different; there is a place for you as a coder. One line of code could be the start.