

INQUIRY BASED MATHS LEARNING with SCRATCH CODE (Primary / Secondary)

relevant to the Irish School System (IRL)

SCRATCH has about 40 million shared projects. Brilliant endorsement of Scratch.

Now * SCRATCH with *ReadySteadyCode* is even better suited to support the 'M' in STEM (or STEAM).

3-stages in learning Maths that lead to Computer Science in Upper Secondary

READY

Ages 4-5 yrs , 5-6 yrs Infants ('Reception' in UK)

READYness through enquiry-based learning with activities, 3-D toys etc.



This is Stage 1: 3-dimensional

STEADY

Ages 6-7, 7-8 yrs (1st and 2nd class primary) (2-Dimensional enquiry-based)

- this stage lays a **STEADY** foundation in Numeracy (tables / number facts)

- 2-D resources (Number Strips on desks/ Notation Boards/ 100-squares etc.)

- CT can be supported with SCRATCH JUNIOR (on tablets)

- sets a **STEADY** basis to move on to Computational Thinking and Code



This is Stage 2: 2-dimensional (often rushed or by-passed by teachers)

* When the developers of SCRATCH in MIT added *Ready-Steady-Code* vector grids into the backdrop library in 2017, it became possible to code short, easy support lessons in most areas of Maths. For teachers in service, this development eases the transition from familiar to unfamiliar, from pen and sum copy to coding on the Scratch stage.

SCRATCH
CODE

Ages 8-9, 9-10, 10-11, 11-12 yrs - (Senior Primary IRL)

Ages 12-13, 13-14, 14-15 yrs - (Junior Cycle - Secondary IRL)

- the stage where **SCRATCH + Vector Grids** makes their grand entrance

- the stage which **supports the 8 Computational Thinking Concepts**

- the stage which **links familiar with unfamiliar** (known with unknown)

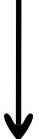
- the stage which **correlates Written assignments with Coding**

- **SCRATCH code is what teaching has been waiting for** (for centuries)

- **SCRATCH code Makes Thinking Visual** (abstract Maths is brought alive)

- **SCRATCH + Vector Grids** is especially supportive of **SEN students/adults**

- **SCRATCH + Vector Grids** opens new opportunities for **FET learners**



This is Stage 3: 1-dimensional and abstract up to this - but now technology brings new possibilities SCRATCH + *ReadySteadyCode* makes understanding Maths easier with the added enjoyment of digital creativity, new challenges and the satisfaction of discovering digital solutions opening opportunities for all (both girls and boys).

'S-T-E' of STEM could be *unplugged* for a year or two into stage 3 (e.g. age 9-10, 4th- 5th class). At this BBC Microchips, Lego WeDo, Lego Mindstorms, Raspberry Pi, Makey-Makey, Arduino etc. could make their entrance to link Scratch coding (with which teachers and children are now familiar) into the Science, Technology and Engineering elements of **STEM** (or STEAM). After 1st Year secondary, begin the transition from visual block-based to text-based programming (Java/ Python as demonstrated at the CESI CS workshops around the country).

Computer Science in Upper Second Level (text-based coding)

A School's Digital Learning Plan will probably reflect these stages of learning