

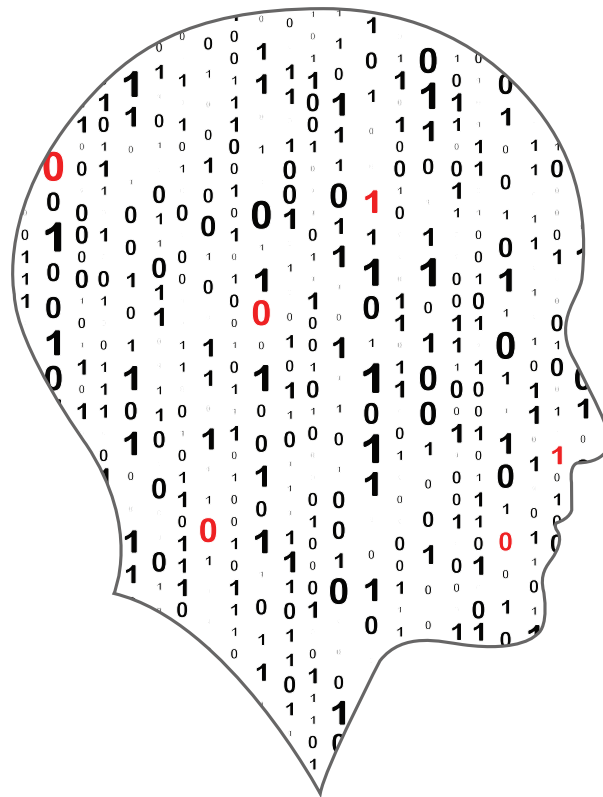


www.pdst.ie



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LEAVING CERTIFICATE COMPUTER SCIENCE

School Leadership Support

LCCS Team



Frank Kehoe – Frankkehoe@PDST.ie



Joe English – Joeenglish@PDST.ie



@PDSTcs

Schedule

10:00am – 11:00am	Session 1 - Introduction - PDST LCCS Team
11:00am - 11:15am	Tea & Coffee Break
11:15am - 11:45am	Session 2 - ICT Infrastructure - PDST TIE Tom Lonergan
12:00pm – 1:00pm	Session 3 - Leadership Support - PDST leadership Mark Dowling
1:00pm – 2:00pm	Lunch

Key Messages



Computer Science is a subject for ALL.

School principals and deputy principals will play a pivotal role in the successful implementation of Computer Science.

School principals and deputy principals will need to be actively engaged in supporting Phase One teachers.

School leaders have an advocacy role to play in the promotion of Computational Thinking as a culture across all subjects within their schools.



Mentimeter

- **URL = www.menti.com**
- **Code = 66 70 24**

Post your questions to be discussed later

Context – National Policy Documents and LCCS

Historical Context

1980

Computer Studies introduced as an interim option in LC Mathematics

1981

"It is my firm intention that Computer Studies will be formally introduced into second-level curriculum as a separate subject by the school-year ... at the latest", Minister John Wilson

1985

Computer Studies introduced as an Intermediate Certificate subject

1993

"Education and the New Technologies of ICT", NCCA discussion paper

2004

"Difficulties and Dichotomies", O' Doherty et. al. (NCCA)

2006+

International Influence: *Computational Thinking* (Wing, 2006) and *Computer Science in New Zealand High Schools* (Bell, Andreae and Lambert, 2010)

Current Context

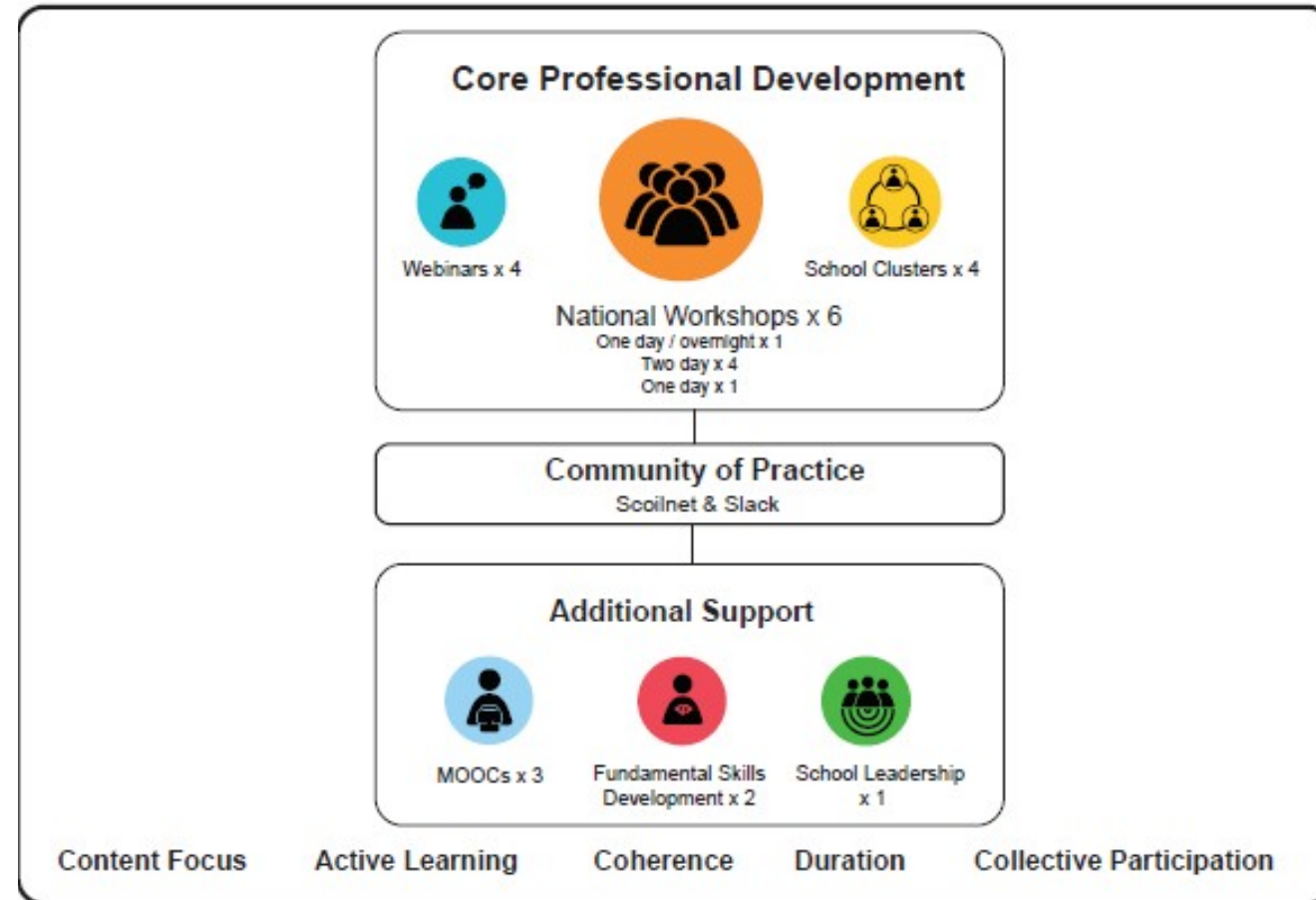


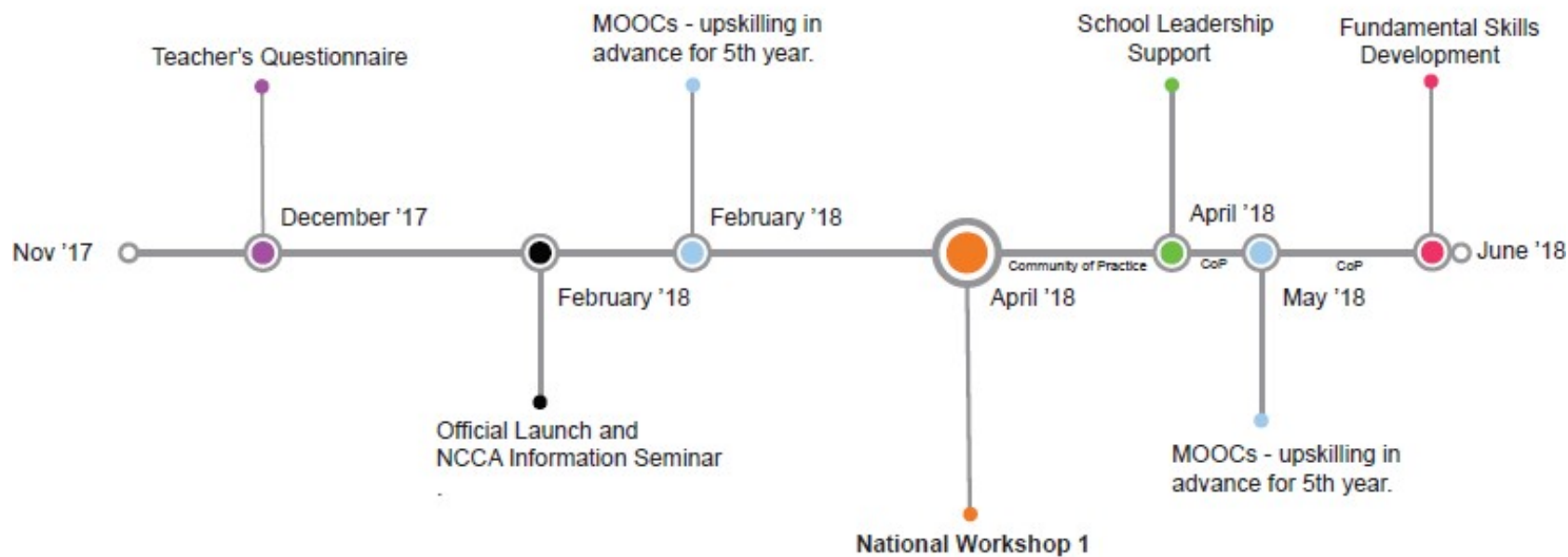
A-Z of LCCS



CPD Framework Review







Timeline - Round 0



Timeline - Round 1 - 5th Year



Timeline - Round 2 - 6th Year

Dates for your Diary for 2018

National Workshop 1	Monday 30 th April & Tuesday 01st May 2018
School Leadership Support (Principals)	Wednesday 9 th May 2018
MOOC II released (online)	Wednesday 16 th May 2018
Skills Development	<p>Wednesday 23th, Thursday 24th & Friday 25th May 2018 (Cohort 1)</p> <p>Monday 28th, Tuesday 29th & Wednesday 30th May 2018 (Cohort 2)</p>
National Workshop 2	<p>Thursday 6th September & Friday 7th September 2018 (Cohort 2)</p> <p>Monday 10th September & Tuesday 11th September 2018 (Cohort 1)</p>
Cluster 1 Meetup	October - details will be given out at National Workshop 2.
Webinar (online)	November - details will be given out at National Workshop 2.

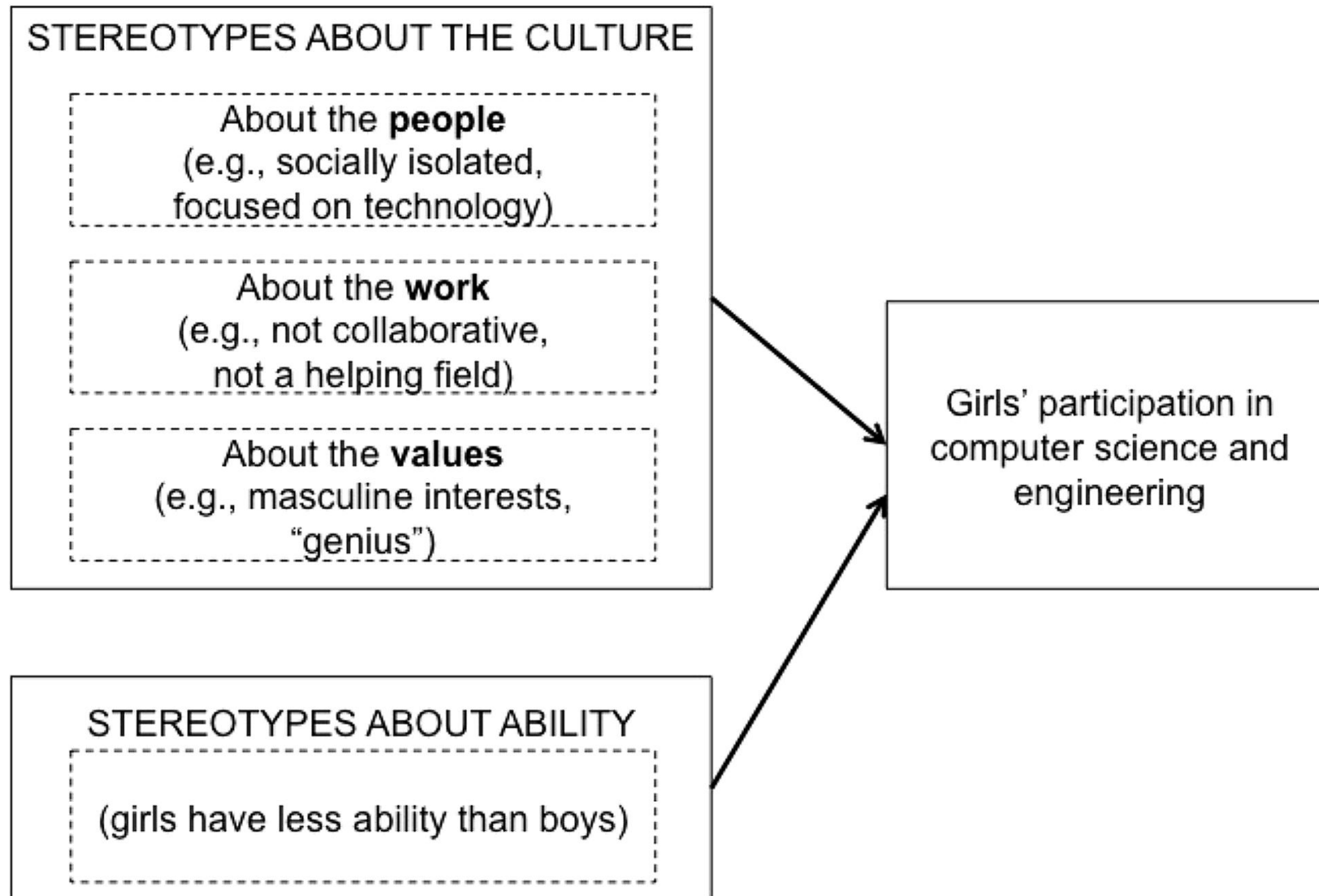
CS For All

‘The Leaving Certificate Computer Science specification is designed for all students.’

‘It applies to many aspects of students’ lives and is therefore relevant to a wide range of student interests.’

LCSS Specification, p2





Cheryan S, Master A, Meltzoff A. Cultural stereotypes as gatekeepers: increasing girls' interest in computer science and engineering by diversifying stereotypes. *Frontiers in Psychology*. 2015;6(49):1–8.

Key Skills - CS and CT

5 Key Skills at Senior Cycle



What is CS ?

Computer science is the study of computers and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society.

(Tucker et al. 2003)

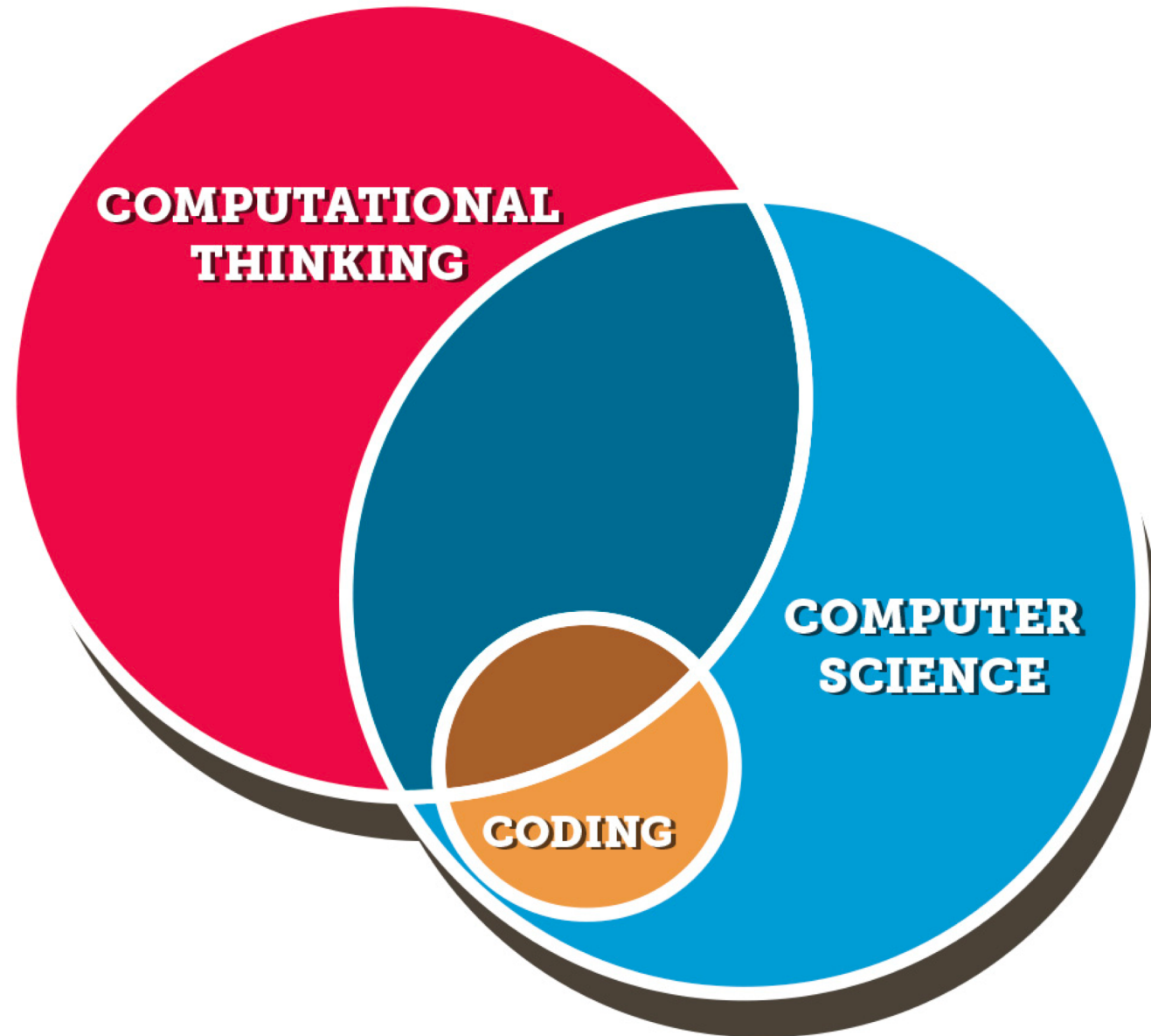
What is Coding ?

Coding is the practice of developing a set of instructions that a computer can understand and execute.

What is CT ?

Computational thinking is “a way of solving problems, designing systems, and understanding human behaviour that draws on concepts fundamental to computer science... a fundamental skill for everyone, not just computer scientists. (Wing, 2006)

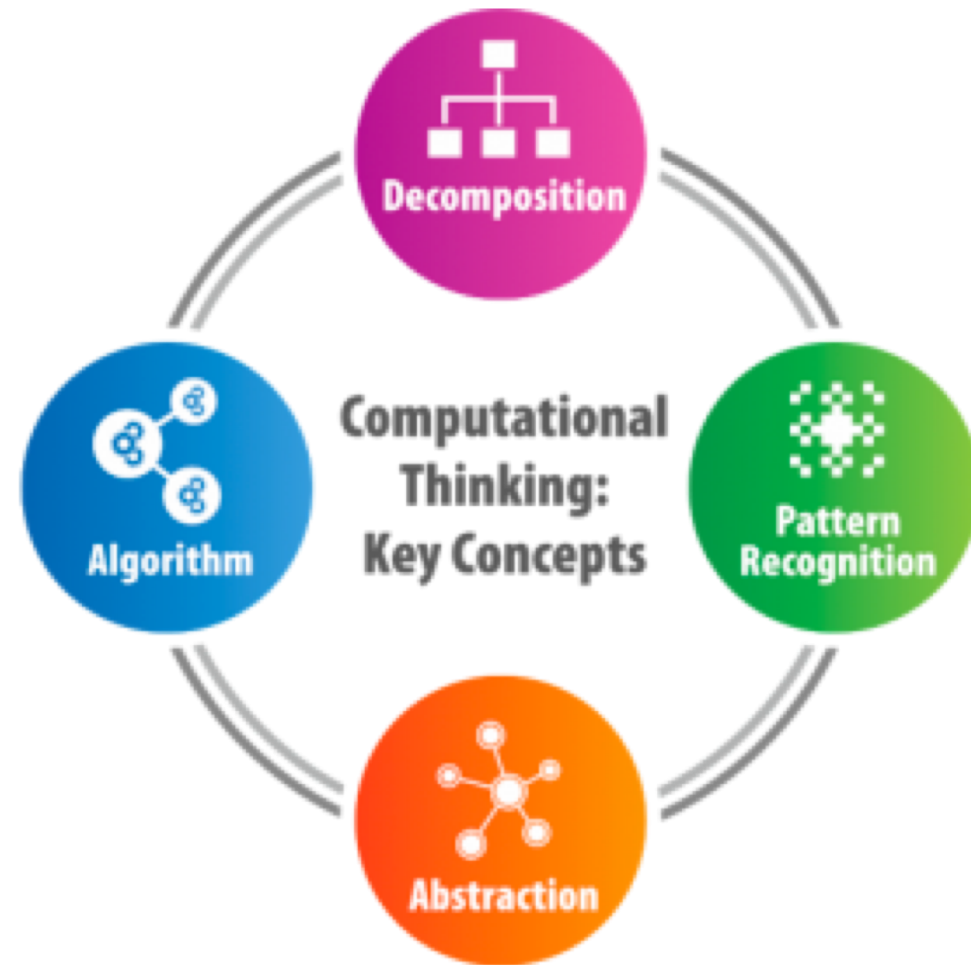




Graphic by Colin Angevine - <http://digitalpromise.org/>

Computational thinking is made up of four parts:

- Decomposition.
- Pattern recognition.
- Abstraction.
- Algorithm design.



Computational Thinking Across Subjects



Graphic by Colin Angevine - <http://digitalpromise.org/>

Computational Thinking as a Whole School Approach

- Area of focus for an School Self Evaluation
- Whole School approach to rich development of Reasoning, Critical Thinking, Problem Solving, Group work Strategies etc.
- Numeracy rich developments.
- Long Term view of its Development.
- Plan, CPD, Subject integration etc.

Promoting LCCS in your school

WHAT WILL STUDENTS LEARN?

Computational Thinking

Students will take a problem in any context, brainstorm possible solutions, then abstract and automate a solution.

Design and Collaboration

Students will create meaningful digital products individually and in teams using reflective design processes.

Programming Languages

Key skills such as personal effectiveness, communication, critical thinking and more are developed through programming concepts, using languages such as Python and Javascript.

Computers and Society

Students will learn about the ethical and social impact of computing technologies, Artificial Intelligence, Big Data, and more, on humans and society.

FOUR APPLIED LEARNING TASKS

Strand 3 comprises four Applied Learning Tasks. These give students opportunities to apply their skills and learn to create digital artefacts in a collaborative manner.

Interactive Information Systems

Students will develop an interactive website that can display information from a database to meet a set of user needs.

ALT 1

Analytics

Students will identify a topic from other subjects or disciplines, and analyse information relevant to that topic to inform and influence decisions around that topic.

ALT 2

Modelling and Simulation

Students will engage with a problem that is difficult to solve analytically, but that is amenable to a solution using simulation or modelling.

ALT 3

Embedded Systems

Students will implement a microprocessor system that uses sensors and controls digital inputs and outputs.

ALT 4

DON'T JUST WAIT FOR THE FUTURE TO HAPPEN. **CREATE IT**

ncca.ie/en/senior-cycle



LCCS 2018 INFORMATION

ncca.ie/en/senior-cycle

NCCA
National Council for Curriculum and Assessment

LEAVING CERTIFICATE COMPUTER SCIENCE



COMPUTER SCIENCE PHASE 1

DESIGNED COLLABORATIVELY BY A TEAM OF COMPUTER SCIENCE EDUCATORS AND STAKEHOLDERS.

40 SCHOOLS SELECTED TO BEGIN THE COURSE IN SEPTEMBER 2018.

PHASE 1 SCHOOLS TO BE ASSESSED IN 2020.

LEAVING CERTIFICATE COMPUTER SCIENCE IS AN OPTIONAL SUBJECT STUDENTS CAN CHOOSE IN 6TH YEAR.



Stephen Hawking
Theoretical physicist and writer

WHETHER YOU WANT TO UNCOVER THE SECRETS OF THE UNIVERSE, OR YOU JUST WANT TO PURSUE A CAREER IN THE 21ST CENTURY, BASIC COMPUTER PROGRAMMING IS AN ESSENTIAL SKILL TO LEARN.



Malala Yousafzai
Social Activist and Writer

EVERY GIRL DESERVES TO TAKE PART IN CREATING THE TECHNOLOGY THAT WILL CHANGE OUR WORLD. AND CHANCE, WHO RUNS IT.

ASSESSMENT BREAKDOWN

70% | 30%

END OF COURSE EXAMINATION | INDIVIDUAL FINAL YEAR PROJECT

PYTHON AND JAVASCRIPT WILL BE THE PROGRAMMING LANGUAGES FOR ASSESSMENT PURPOSES IN PHASE 1.

Course Structure

Three Strands

STRAND 1 - PRACTICES AND PRINCIPLES

- COMPUTATIONAL THINKING
- COMPUTERS AND SOCIETY
- DESIGN AND DEVELOPMENT

STRAND 2 - CORE CONCEPTS

- ABSTRACTION
- BASIC ALGORITHMS
- COMPUTER SYSTEMS
- DATA
- EVALUATION AND TESTING

STRAND 3 - COMPUTER SCIENCE IN PRACTICE

- INTERACTIVE INFORMATION SYSTEMS
- ANALYTICS
- MODELLING AND SIMULATION
- EMBEDDED SYSTEMS

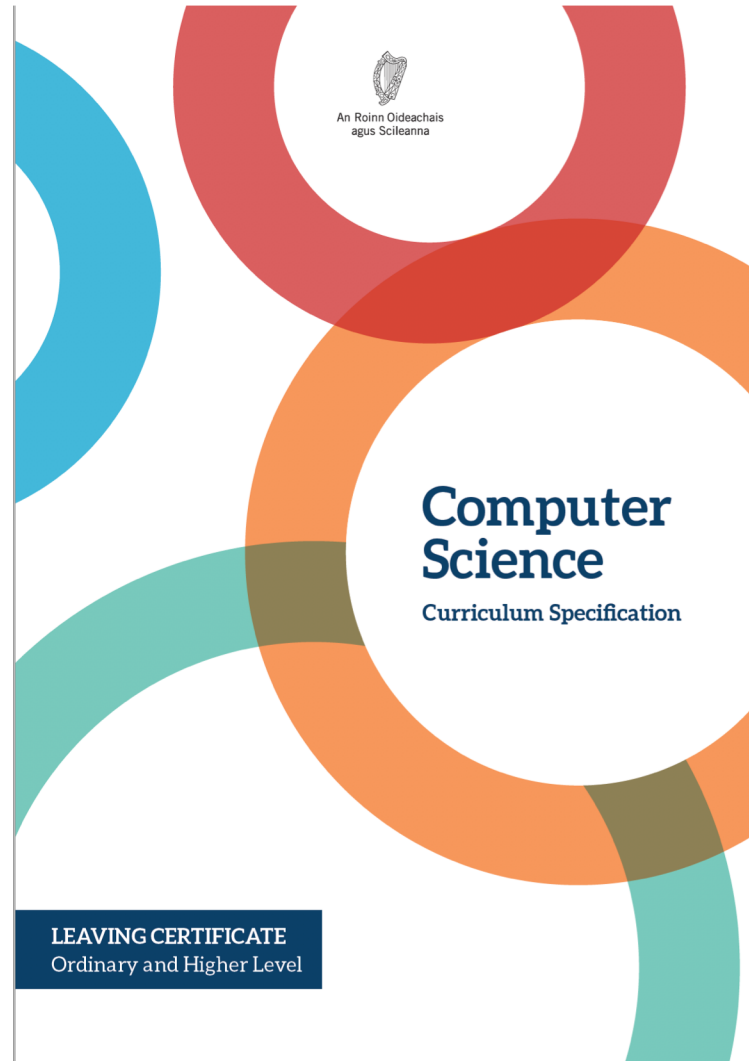
<https://www.ncca.ie/media/3261/lccs-information-brochure.pdf>

PDST

LCCS Launch Video



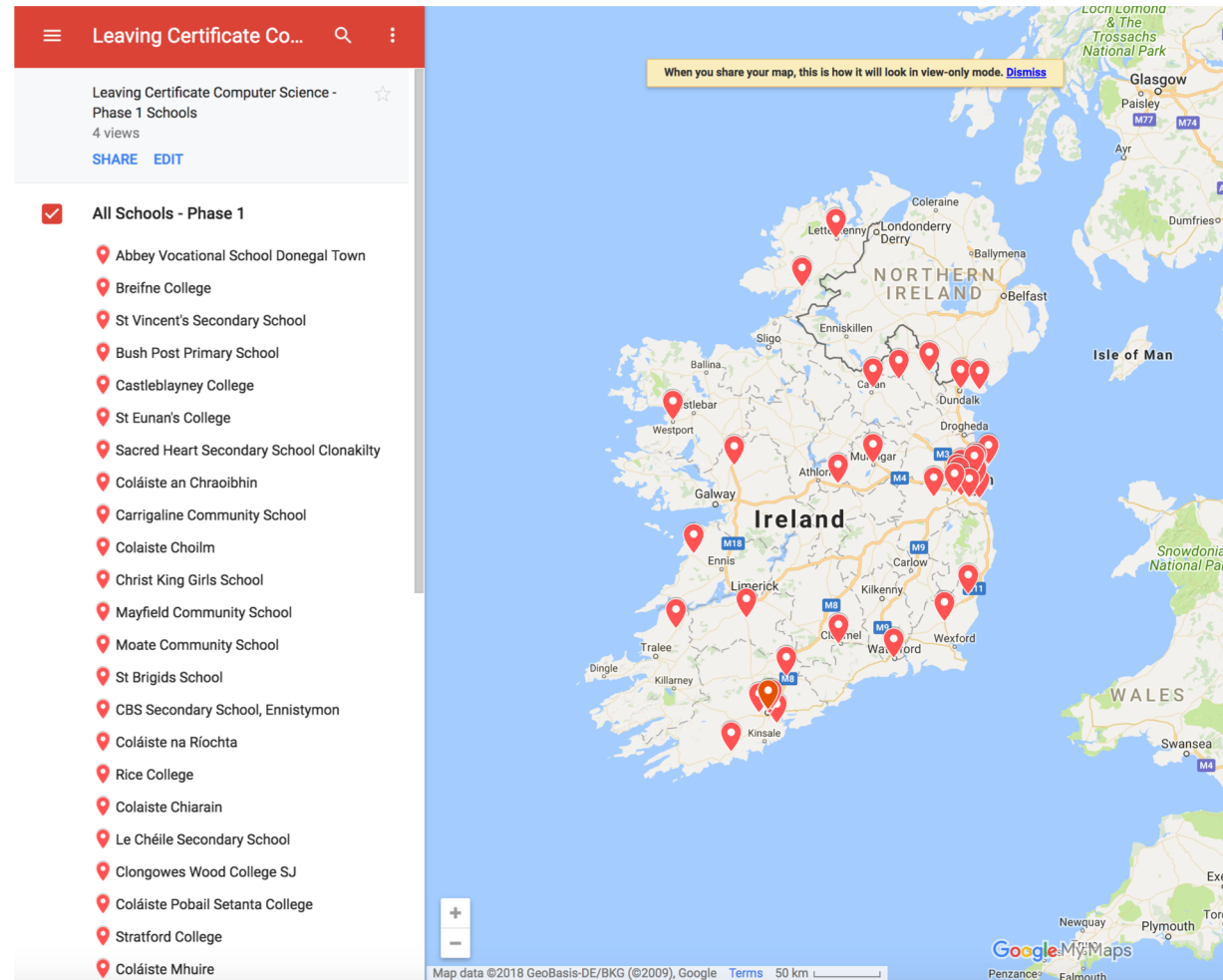
<https://www.ncca.ie/en/senior-cycle/curriculum-developments/subjects-and-frameworks-in-development/computer-science>



<https://curriculumonline.ie/getmedia/d73af6e3-b4e5-4edb-a514-6383e2306a4b/16626-NCCA-Specification-for-Leaving-Certificate-CS-WEB-v4.pdf>

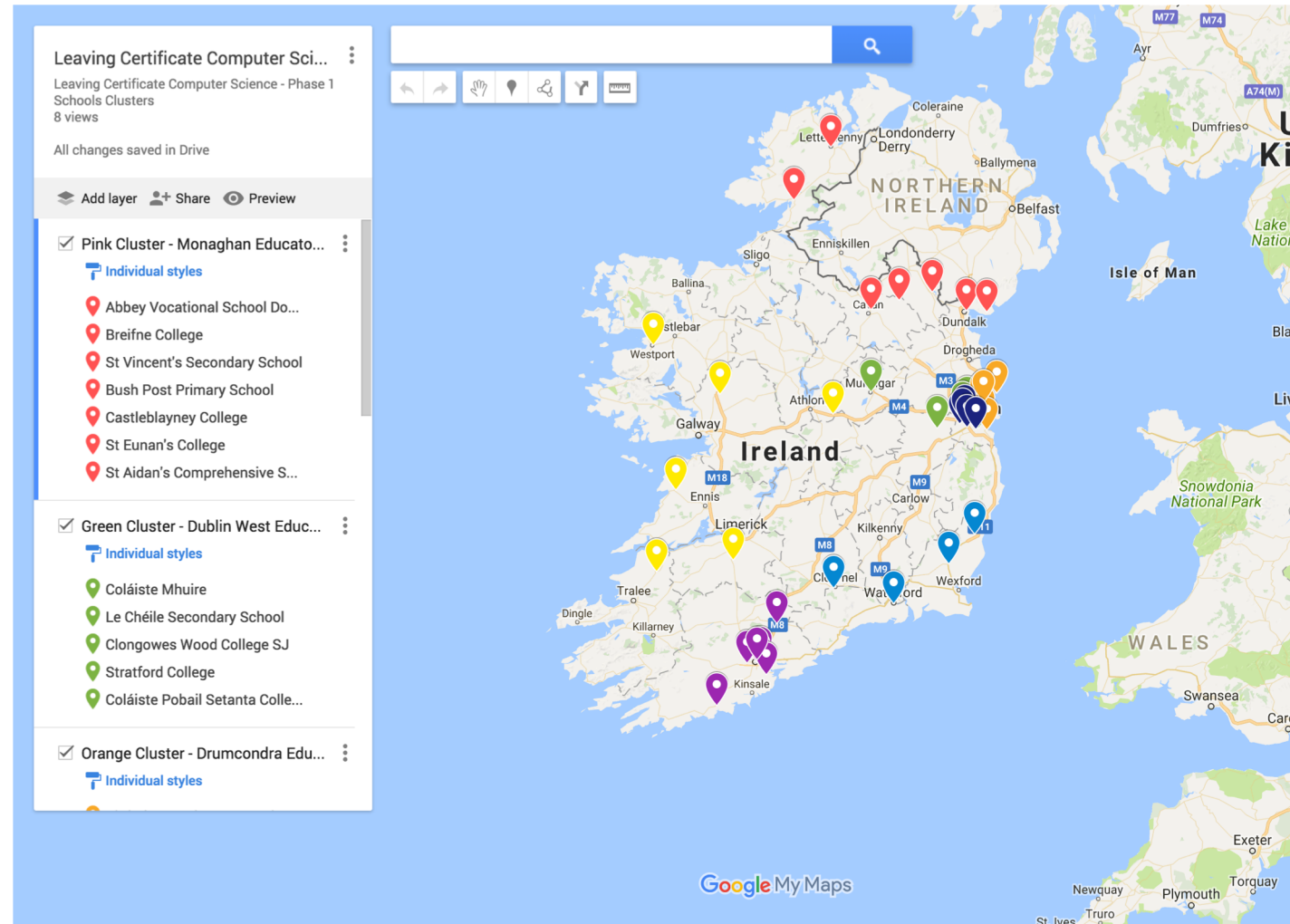
LCCS CPD Organisation

Cohorts



<https://drive.google.com/open?id=1Id988Dv9-L5z6CHLoM3e6ixZmYeeqLV&usp=sharing>

Clusters



<https://drive.google.com/open?id=10cwKQBaqvMQN12lqzfi7PrjiwOWuHNeB&usp=sharing>

LCCS Community of Practice



CompSci & Slack

COMPSCI.IE

SIGN IN | REGISTER | SCOILNET

Search Resources

Browse Resources

Add a Resource +


Senior Cycle

Computer Science

Refine further


No options

SUPPORTING LEAVING CERT COMPUTER SCIENCE




LCCS CPD

PDST CPD events and resources



Q&A Section

Find common questions that teachers have about Computer Science.




CESI CS

CESI mailing list - Join the discussion.

WHAT'S NEW

Recently Added

PDST 

What is Compsci.ie?

Who is it for?

Why is it needed?

How does it work?

Where is my role?



Workspace = pdstcs.slack.com

Question Board

The screenshot displays a Slack workspace interface. On the left is a dark sidebar with the workspace name 'pdstcs' and a user profile for 'Frank Kehoe'. Below this are sections for 'All Threads', 'Channels' (with a plus icon), 'Direct Messages' (with a plus icon), and 'Apps' (with a plus icon). The 'Channels' section lists '# general' (highlighted in green), '# question-board', and '# random'. The main area shows the '#general' channel header with a description: 'Company-wide announcements and work-based matters'. Below the header is a message from '@Joe English' stating: '@Joe English created this channel on November 17th, 2017. This is the very beginning of the #general channel. Purpose: This channel is for workspace-wide communication and announcements. All members are in this channel. (edit)'. Below the message are links for '+ Add an app' and 'Invite others to this channel'. A date separator for 'November 17th, 2017' is visible. Below the date is a message from 'Joe English' at 4:16 PM stating: 'joined #general along with Frank Kehoe.'. At the bottom is a message input field with a plus icon, the placeholder text 'Message #general', and icons for mentioning and emoji.

pdstcs

Frank Kehoe

All Threads

Channels

general

question-board

random

Direct Messages

Frank Kehoe (you)

Joe English

+ Invite People

Apps

#general

☆ | 👤 2 | 🔒 0 | Company-wide announcements and work-based matters

@ ☆ ⋮

general

@Joe English created this channel on November 17th, 2017. This is the very beginning of the #general channel. Purpose: This channel is for workspace-wide communication and announcements. All members are in this channel. (edit)

+ Add an app Invite others to this channel

November 17th, 2017

Joe English 4:16 PM
joined #general along with Frank Kehoe.

+ Message #general @

CESI



Computers in Education Society of Ireland
Cumann Ríomh-Oideachais na hÉireann

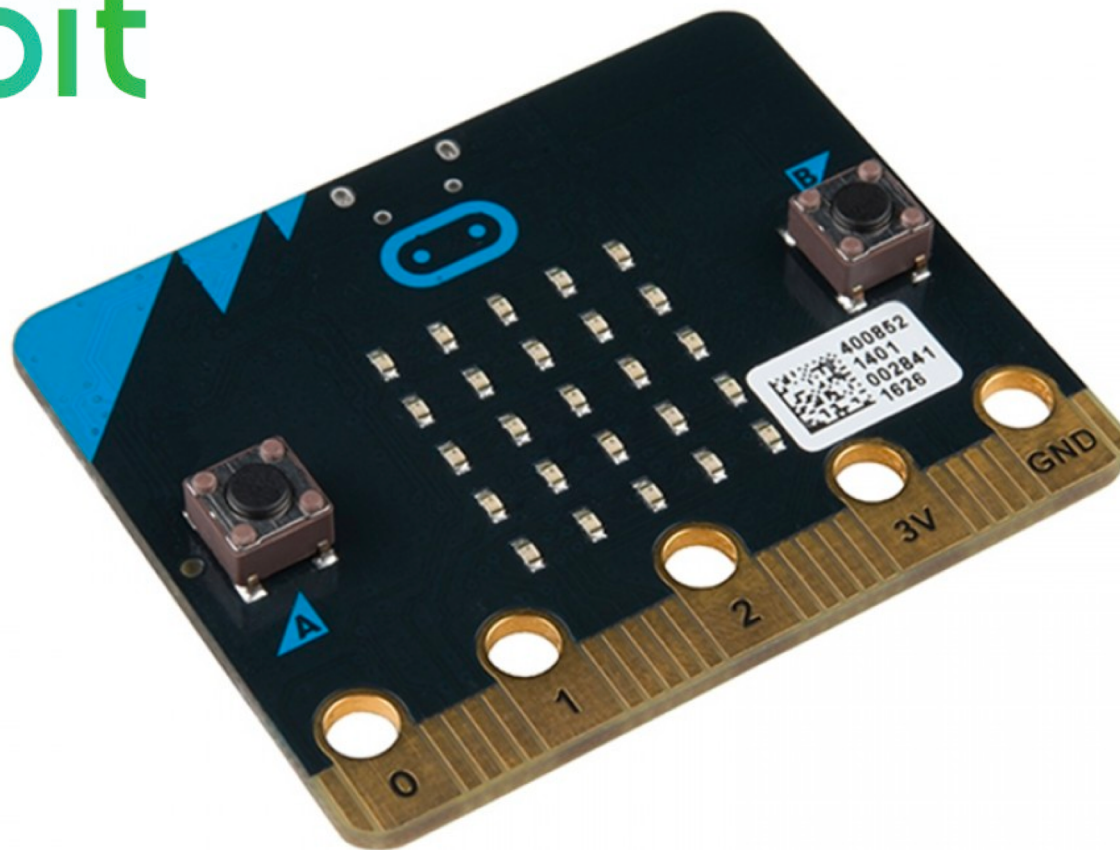


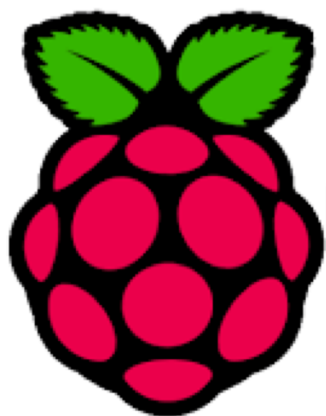
LCCS Grant

- *To support the implementation of the LCCS specification, a grant of €3000 will be issued to the Phase 1 representative cohort of 40 schools.*
- *The purpose of this grant is solely to support the introduction and implementation of the new subject. The grant should be ring-fenced within the school for this purpose.*
- *It is envisaged that the bulk of the grant, for most schools, will be used to purchase hardware for classroom use for Applied Learning Task 4 – Embedded Systems.*
- *Many schools will need to purchase a sufficient number of microprocessor units to facilitate teachers and students in carrying out ALT4.*
- *It is essential that school authorities consult the LCCS teacher to appraise the most efficient way to deploy the grant in support of the implementation of the subject.*

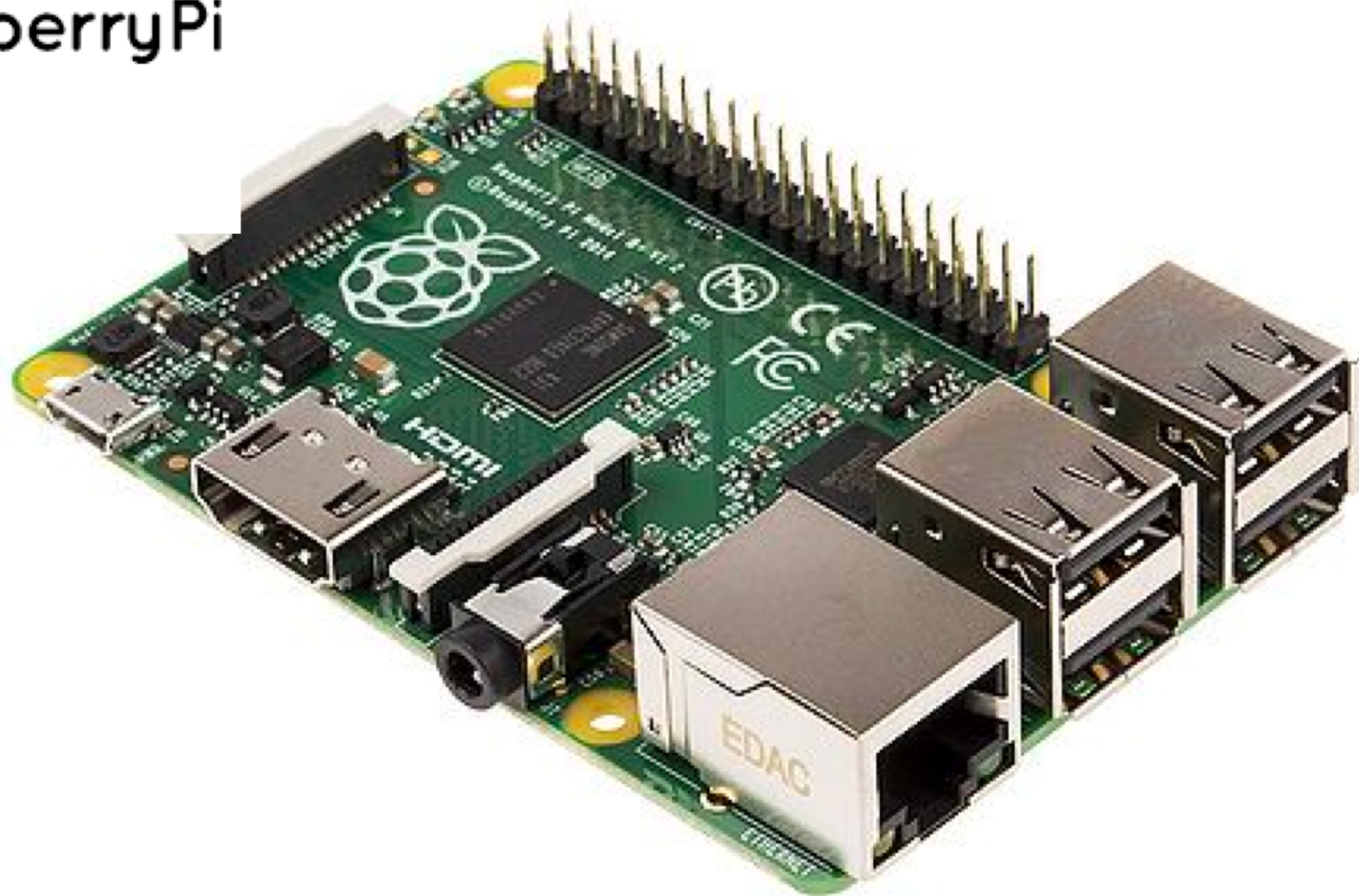
Microprocessors

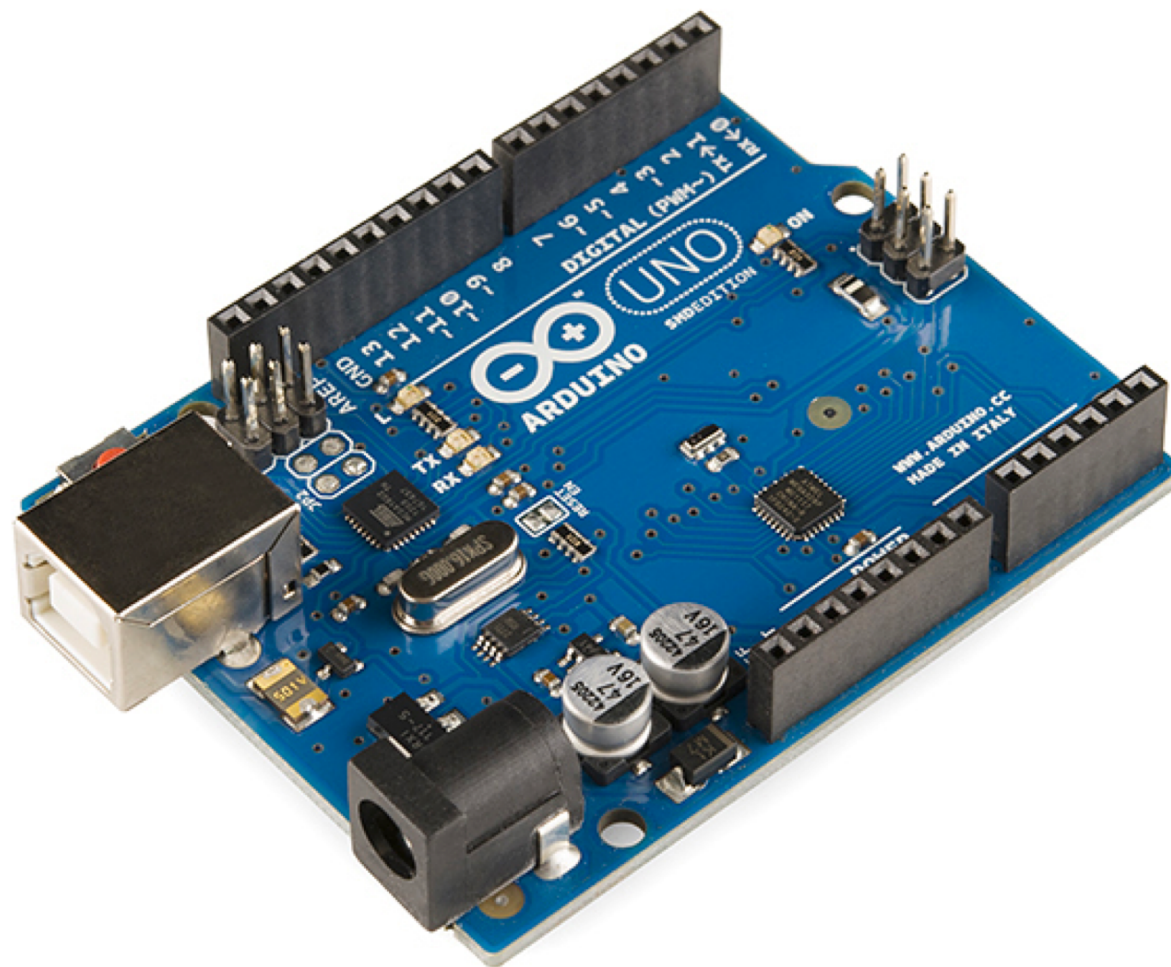
Schools are free to choose what type of microprocessors they will use for ALT 4.





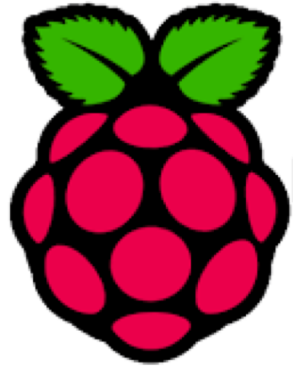
RaspberryPi





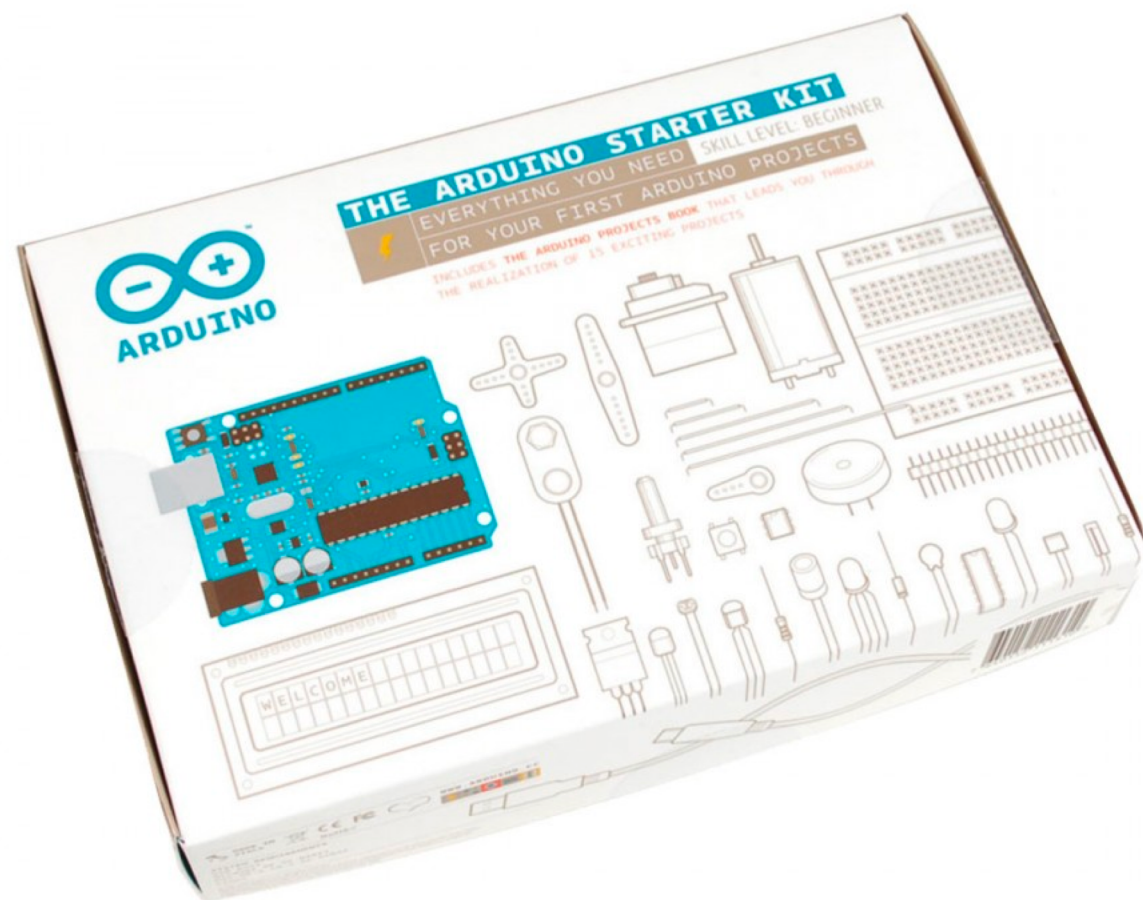
Microprocessors Kits





Raspberry Pi





Suppliers

- www.forthings.io
- www.yobibit.ie
- www.kitronik.ie
- www.wriggle.ie/coding_students
- www.sgeducation.ie
- www.raspberrypi.org/products
- <https://thepihut.com>
- www.maplin.ie
- <https://ie.rs-online.com>
- www.e.farnell.com

This is not an exhaustive list | PDST does not endorse any one particular supplier | Be careful you check the lead in time for delivery as some suppliers have taken months to delivery larger order for some schools.



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