



An Roinn Oideachais agus Scileanna Department of Education and Skills



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LEAVING CERTIFICATE COMPUTER SCIENCE

National Workshop 3



Key Messages

Leaving Certificate Computer Science aims to develop and foster the learner's creativity and problem solving, along with their ability to work both independently and collaboratively.

Computing technology presents new ways to address problems and computational thinking is an approach to analyse problems, design, develop and evaluate solutions.

The computational artefacts that students design through engaging with the ALTs should be personally relevant to them or their peers, to their community or to society in general.

The externally assessed coursework will be based on all learning outcomes, with those of strand 3 being particularly relevant.

The Learning Outcomes are designed so that the learners can engage with them to varying degrees depending on their ability and the support they are given by their teachers.



Schedule – Day 1

11.00am - 1.00pm	Session 1: Data Analytics and ALT2
	Lunch
2.00pm – 4.30pm	Session 2: ALT2 – Project Design and Development Curriculum Planning & Assessment
4.30pm – 5.00pm	LERO Presentation
7.00 pm	Dinner & Twilight Talk



National Workshop 2 Quick Recap



Main topics...

Curriculum Planning Teacher Critical Reflection Computational Thinking Pedagogies suitable for CT Introduction to the micro:bit Programming Pedagogies ALT4 Embedded Systems The Design Process



Session 1 Data Analytics and ALT2



Part 1 Data Analytics



www.pdst.ie

Mentimeter

- URL = www.menti.com
- Code = 18 00 64



Go to www.menti.com and use the code 47 10 01

What words do you associate with Data Science / Data Analytics?

Mentimeter







To view

Download the add-in.

liveslides.com/download

Start the presentation.

Individual Activity









To view

Download the add-in.

liveslides.com/download

Start the presentation.

"Data is the new oil"



www.pdst.ie

Data Evolution





Source: https://slideplayer.com/slide/12707669/

Traditional Application Architecture



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... and then



Annual Size of the Global Datasphere



Source: IDC's Data Age 2025 study, sponsored by Seagate, April 2017



Data Science ... Analysis ... Big Data

Data Science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from data in various forms, both structured and unstructured, similar to data mining.

Data Analysis is a process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information, informing conclusions, and supporting decision-making

Big Data is extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.

Data mining is the practice of examining large pre-existing databases in order to generate new information.

Machine Learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.



Part 2 Applied Learning Task 2 (ALT2)



LCCS Interwoven

The four applied learning tasks explore the four following contexts:



Explore and teach the LOs through the lens of ALTs.



'Students work in teams to carry out four applied learning tasks over the duration of the course.'

'Each of which results in the creation of a real or virtual computational artefact.'

> 'These artefacts should relate to the students' lives and interests.'

'Where possible, the artefacts should be beneficial to the community and society in general.'

> 'Examples of computational artefacts include programs, games, web pages, simulations, visualisations, digital animations, robotic systems, and apps. PDS

LCCS Specification: p15



ALT2

Hypothesising, making predictions, examining evidence, recognising patterns and reaching conclusions.

Students will identify an interdisciplinary topic, develop a hypothesis and utilise existing resources to highlight the salient information and inform future decisions.

By identifying, analysing, and deconstructing a problem, students will deepen their understanding of the practices and principles of computer science.

LCCS Specification: p22



Hypothesis originates from the Greek work *hupo* (under) and *thesis* (placing). It means an idea made from limited evidence. It is a starting point for further investigation.



ALT2 Learning Outcomes

- 3.4. Develop algorithms that can find the frequency, mean, median and mode of a data set.
- 3.5. Structure and transform raw data to prepare it for analysis.
- 3.6. Represent data to effectively communicate in a graphical form.
- 3.7. Use algorithms to analyse and interpret data in a way that informs decision-making.





Get Data Visualise Analyse Prepare Review Publish Clean Ast





ASK – The Question that starts the journey

PREPARE – Sketch out, think through ideas to organise work.

GET DATA – Collect, enter, reuse or repurpose.

CLEAN – Format, layout, organise.

ANALYSE – Format, layout, organise, sort, filter, summarize, triangulate.

VISUALISE – Format charts, tables, add logos, branding, colours.

REVIEW – Gather feedback, find errors, check interpretations.

PUBLISH – Secure and share within or outside the team.



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Individual Activity





Part 3 NCCA Resources



Demonstration of Samples



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Main Breakout Activity



In Pairs – teachers deconstruct and explore another NCCA ALT2 sample











How did you do it?

How would you support students to engage in a similar process

What has challenged your thinking?

Which LOs did you use?



Problems?

Presentation & Debrief PDS





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