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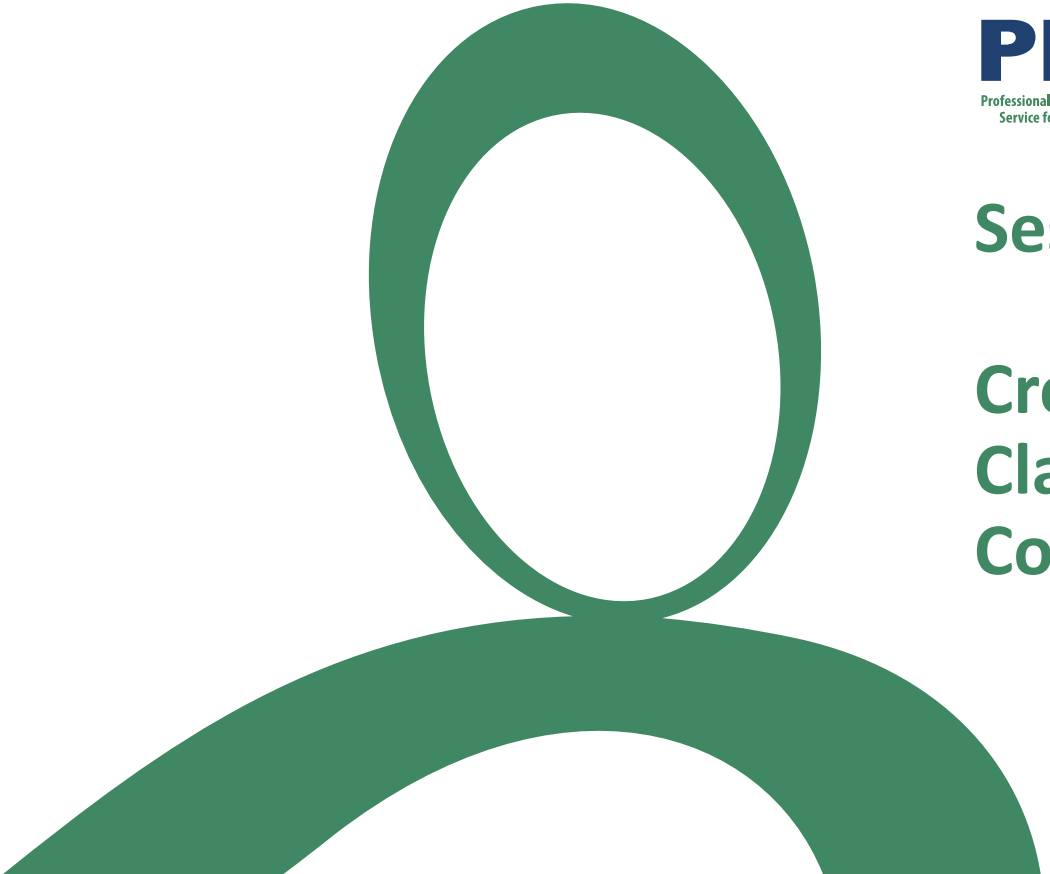
Professiona Deve opment Service for Teachers | An tSeirbhís um Fhorbairt Ghairmiúi do Mhúinteoirí

An Roinn Oideachais
Department of Education

LEAVING CERTIFICATE
COMPUTER SCIENCE

# National Workshop 5



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# Session 2

# Creating an Inclusive Classroom: SEN in Computer Science

# Objectives

**Participants will be enabled to:**

Develop an understanding of Inclusion, SEN and current policy.

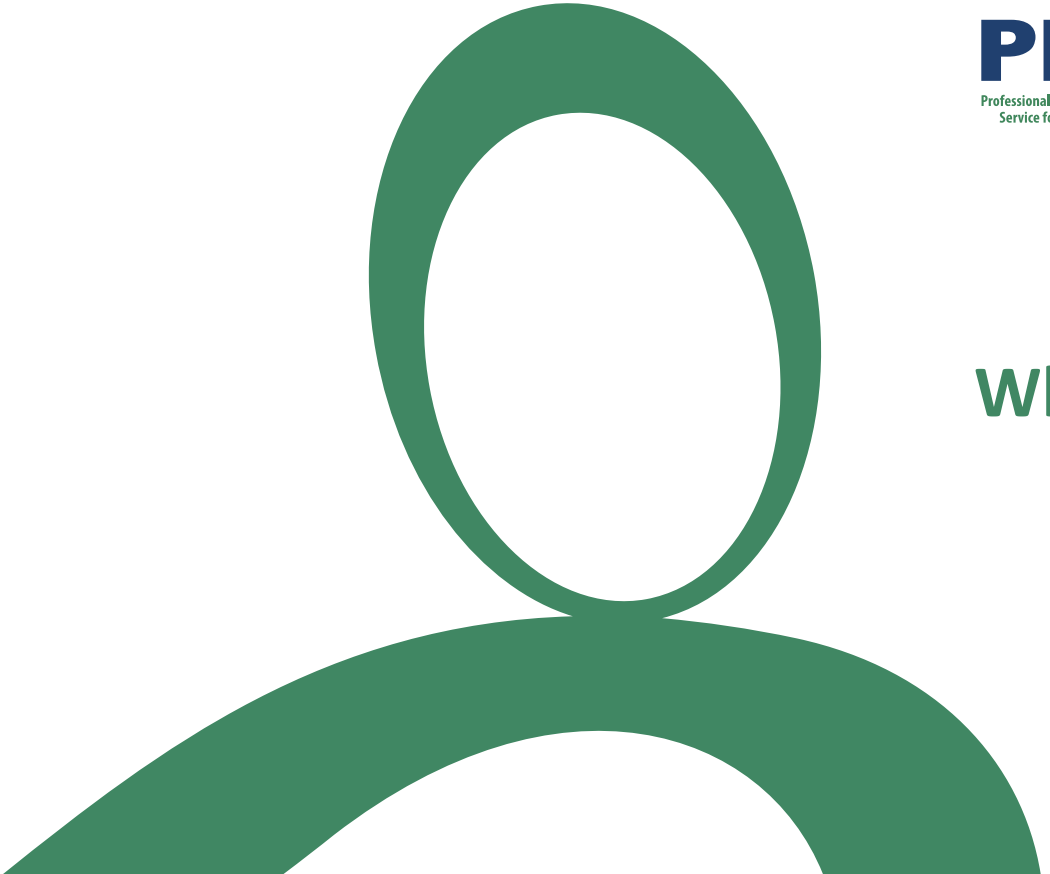
Make the link with Leaving Certificate Computer Science.

Recognise the broad range of guidelines and resources available.

Use current accessibility features and tools.

Bring inclusive teaching practices for CS back to the classroom.

Develop a shared understanding of the challenges and possible strategies for a wide range of SEN categories.



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# What is Inclusion?

# Perspectives on Inclusion

‘Technology should be a vehicle by which students reflect and demonstrate understanding of their intersectional identities’

‘Inclusion is creating space for nurturing and caring relationships’

- *Shuchi Grover at InclusiveSTEMCS ‘21*

# Perspectives on Inclusion

‘Different forms of assessment privilege different forms of understanding’

- *Dr Shuchi Grover*

‘[Our classrooms contain] … minoritised learners, rather than minority learners’

- *Prof Tia Madkins*

In its broadest sense, **inclusion** describes the extent to which individual pupils are integrated within the educational system. The EPSEN Act, (2004) in the Republic of Ireland and the Code of Practice (DENI, 1998) in Northern Ireland mandate the creation of inclusive learning environments in Irish schools.

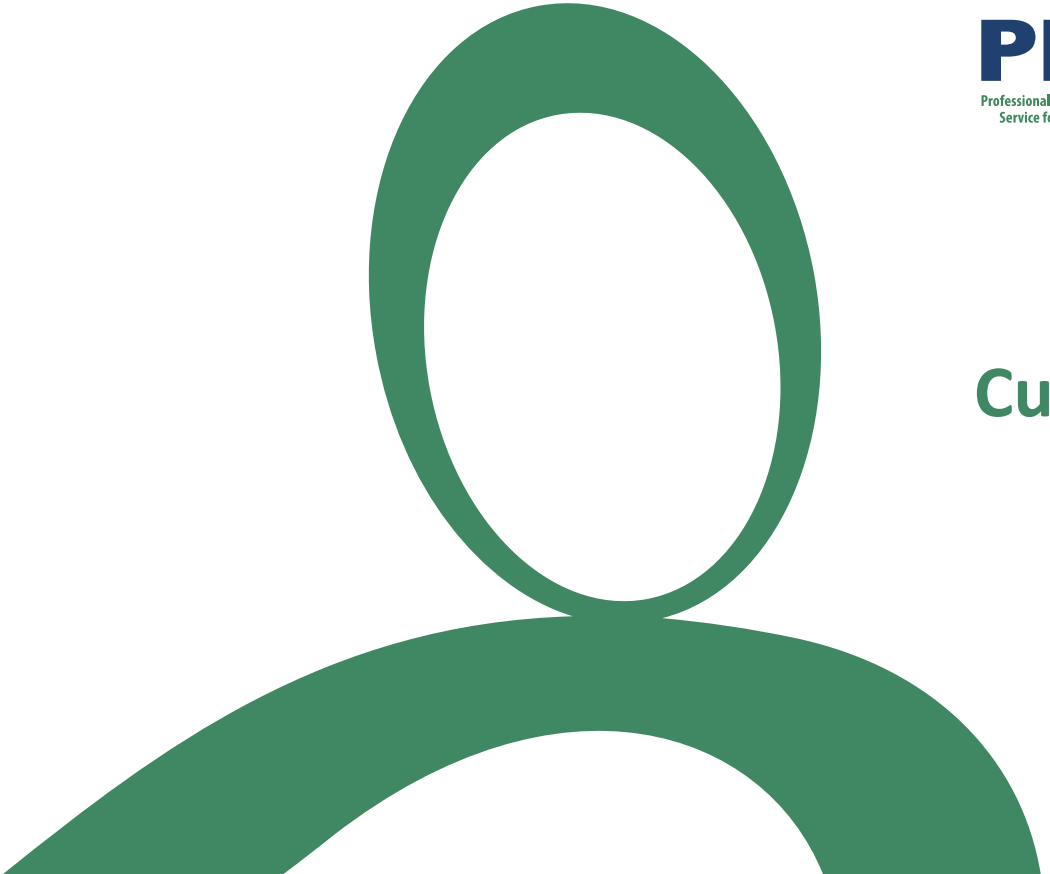
https://ncse.ie/wp-content/uploads/2014/10/InclusiveEducationFramework_InteractiveVersion.pdf

# What is inclusion menti

reflection/warmup

# Warm-up: Inclusion

*What does an inclusive classroom look like? What does inclusion mean to you?*



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# Current Policy

## Special Educational Needs are defined as:

*A restriction in the capacity of the person to participate in and benefit from education on account of an enduring physical, sensory, mental health or learning disability, or any other condition which results in a person learning differently from a person without that condition*.

The EPSEN Act recognises that special educational needs may arise from four different areas of disability: • *physical* • *sensory* • *mental health* • *learning disability.*

EPSEN Act, 2004

# Current Policy

An Roinn Oideachais agus Scileanna
Rannóg Oideachais Speisialta
Cor na Madadh
Átha Luain
Contae na hIarmhí

Department of Education and Skills
Special Education Section
Cornamaddy
Athlone
Co. Westmeath

Circular No 0014/2017

**Circular to the Management Authorities of all Post Primary Schools: Secondary, Community and Comprehensive Schools and the Chief Executive Officers of the Education and Training Boards**

**Special Education Teaching Allocation**

**1. Purpose**

The purpose of this Circular is to advise schools of the revised allocation process for Special Education Teachers to mainstream post primary schools from the 2017/18 school year.

This revised allocation process will replace the Learning Support and English as Additional Language Support (LS/EAL) scheme, whereby a general allocation of resources had previously been allocated to post primary schools annually.

It will also replace the National Council for Special Education (NCSE) allocation process which provided additional resource teaching supports to schools, to support students who had been assessed as having Low Incidence disabilities, in accordance with DES Circular 70/2014 https://www.education.ie/en/Circulars-and-Forms/Active-Circulars/cl0070_2014.pdf

It will also replace the allocation process for post primary schools to support students with High Incidence special educational needs, as set out in DES Circular 0010/2012 https://www.education.ie/en/Circulars-and-Forms/Archived-Circulars/cl0010_2012.pdf

**The new Special Education Teaching allocation will provide a single unified allocation for special educational teaching needs to each school, based on that school's educational profile.**

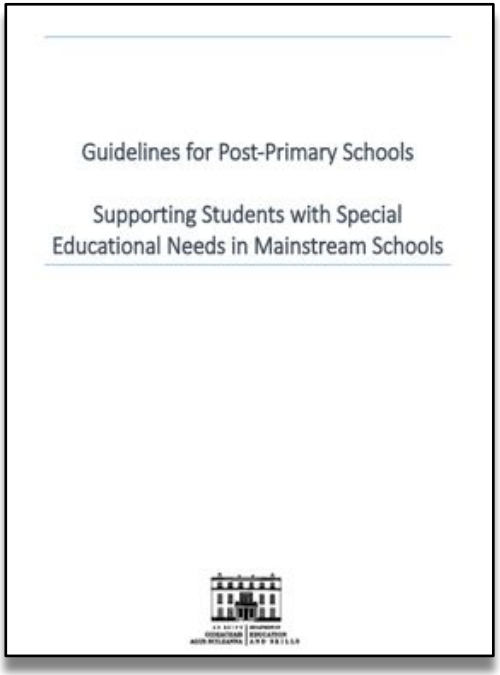
1

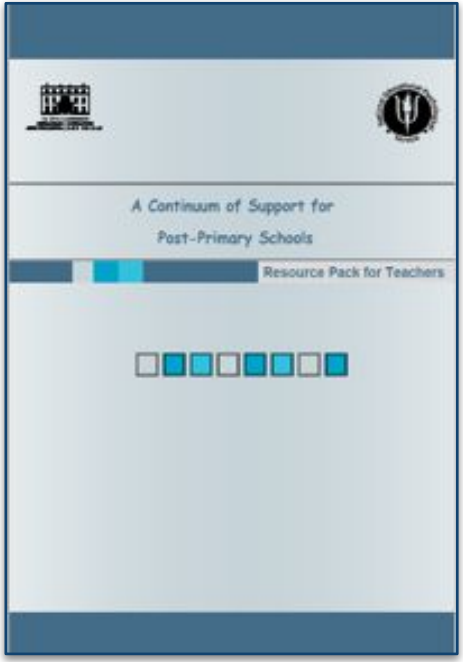
Circular No 0014/2017

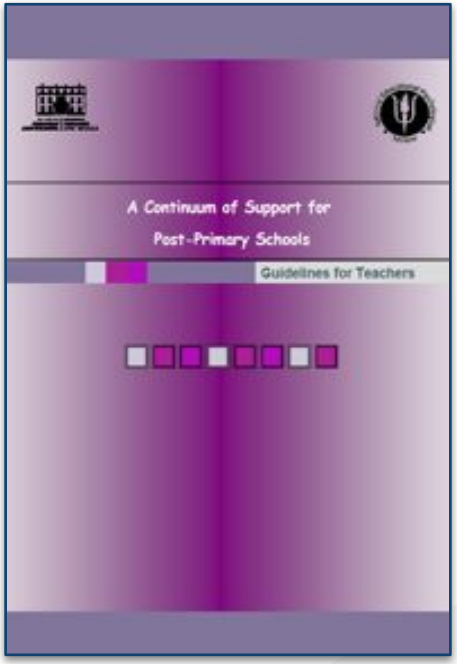
It is the responsibility of the classroom teacher to ensure that each student is taught in a stimulating and supportive classroom environment where all students feel equal and valued.

- *13. The Role of the Classroom Teacher*

# Current Policy



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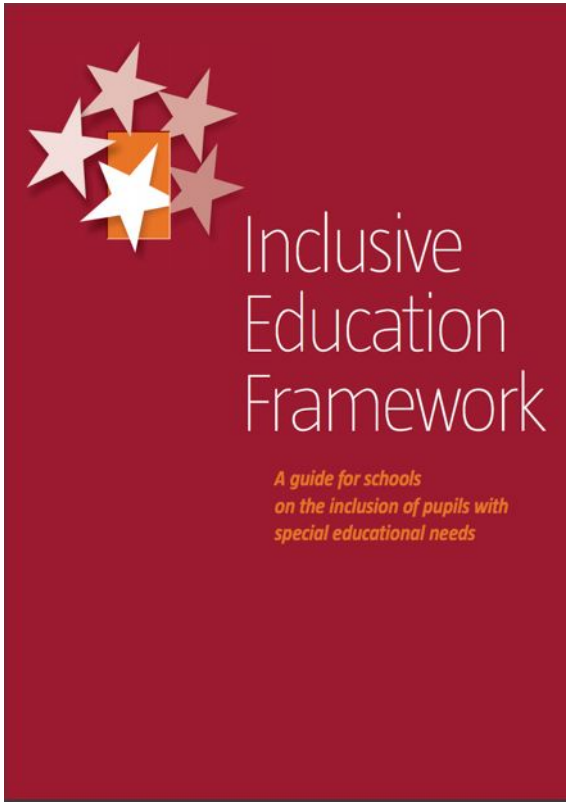
ncse
An Chomhairle Náisiúnta um Oideachas Speisialta
National Council for Special Education



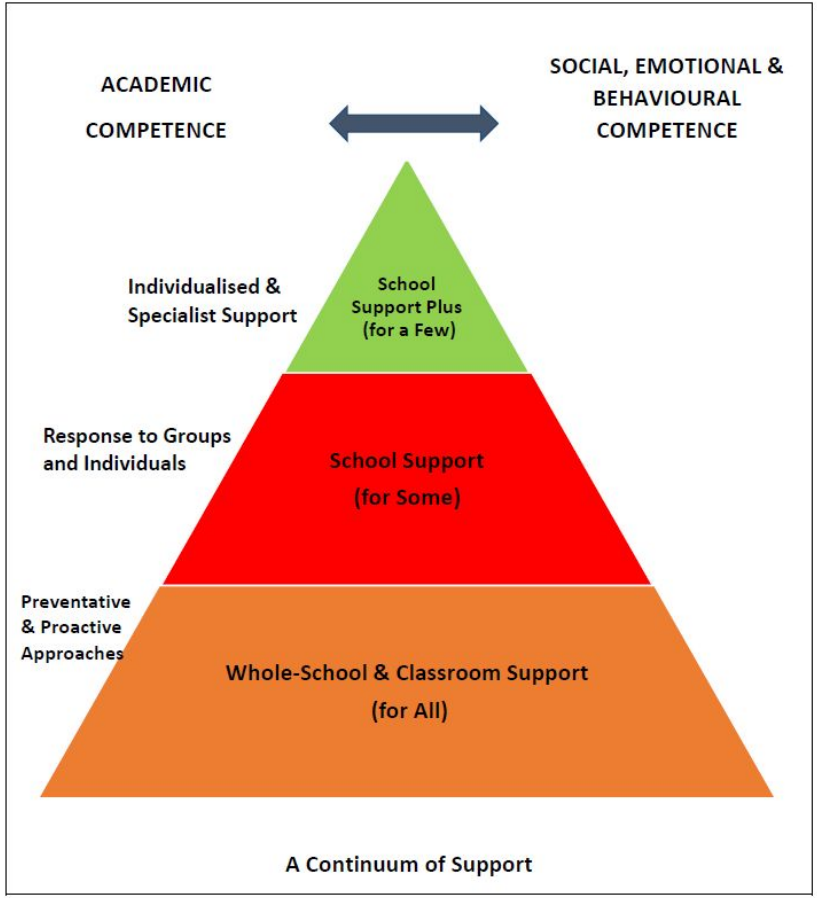
# SET and SNA Allocation

Schools now receive an allocation of SET (special education teaching) hours and SNA positions based on the school's profile.

The responsibility for the distribution of these resources to students has been devolved to the management of each school.

Students no longer need a diagnosis to access SET/SNA resources.

# Continuum of Support



# The Student Support File

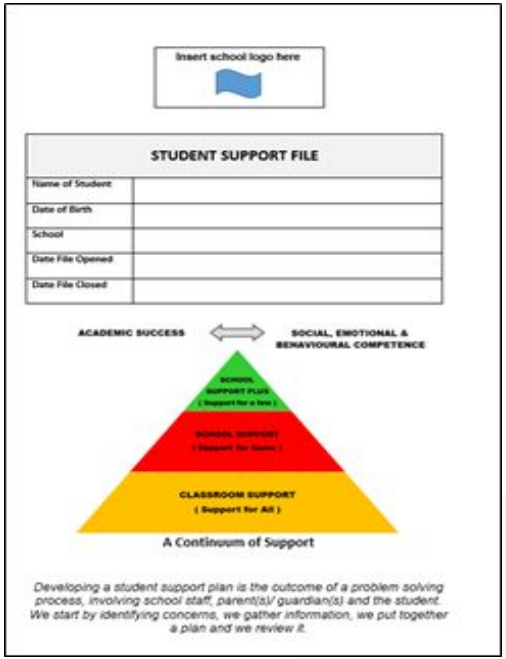
Tracks the student's pathway through the Continuum of Support.

Documents progress and needs over time.

Ensures continuity of support for a student, including transition from primary to post-primary school.

Assists schools in providing an appropriate level of support to students, in line with their level of need.

Collates all information about the support of the student: information gathered, plans and interventions, consultations and reviews.



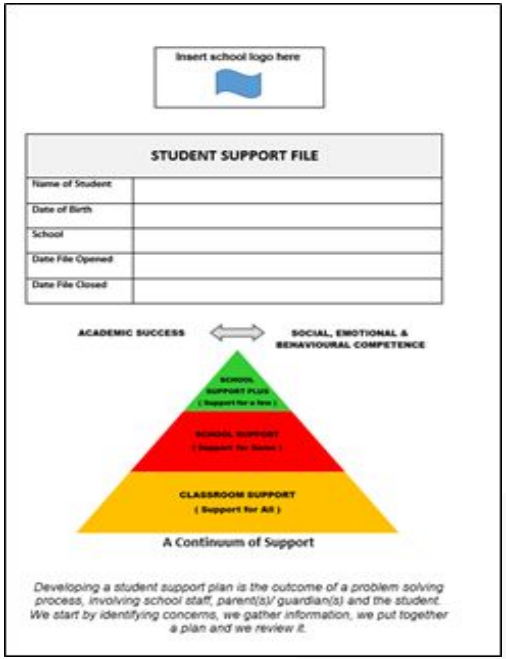
# The Student Support File

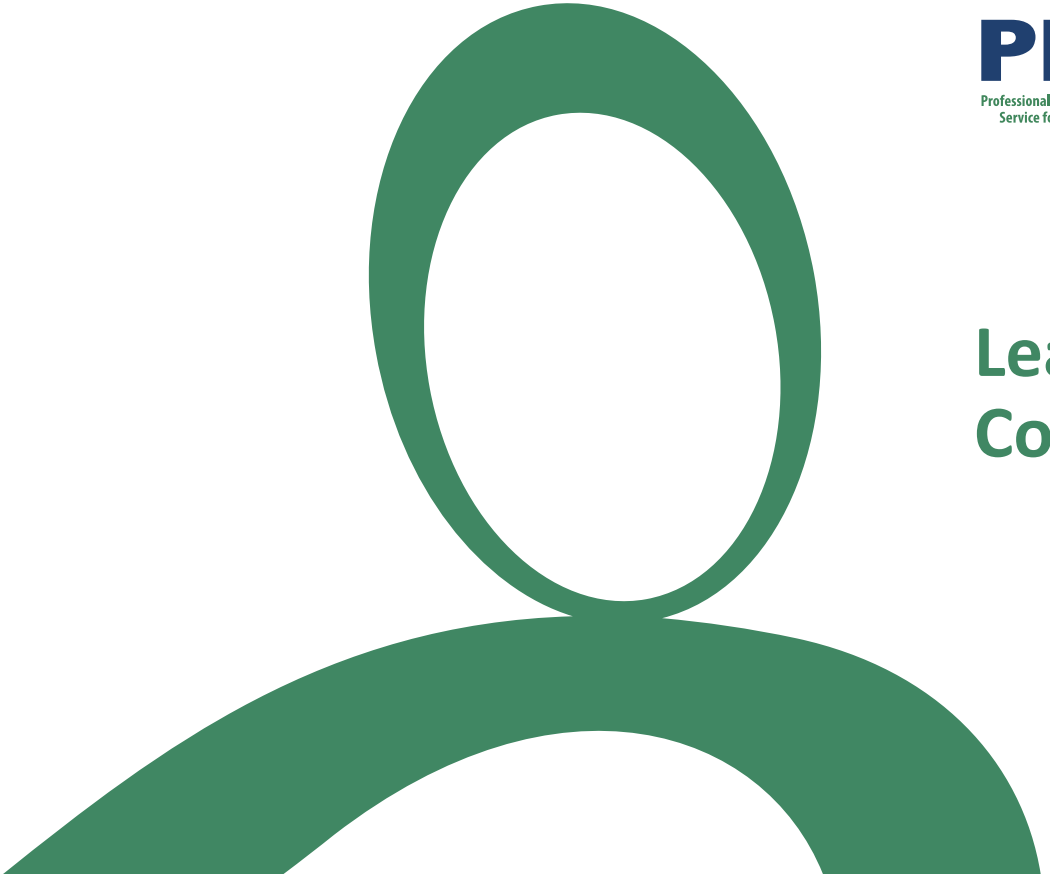
Highlights a student's particular Strengths and Needs

Sets a small number of goals and targets for the year/term.

Give teachers insight into areas of particular skills/interests for the student

Allows teachers to create specific supports to help meet students' current needs/targets.





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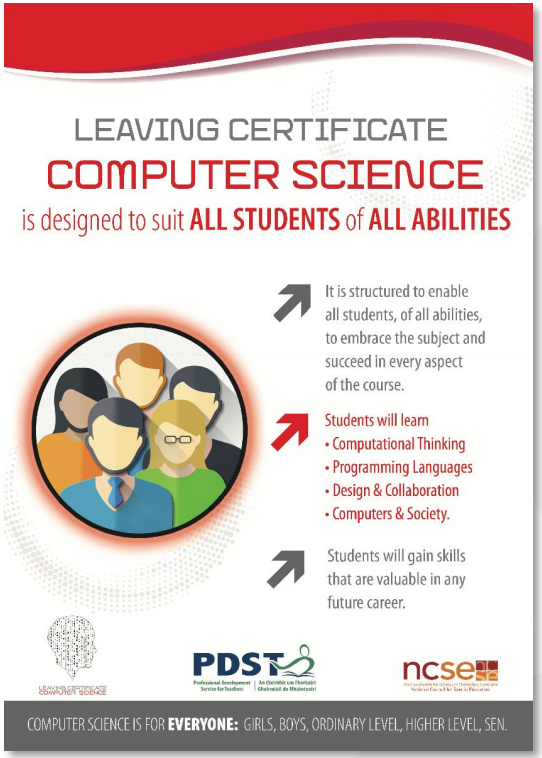
# Leaving Certificate Computer Science

**CS For All – For all students who want to do it!**

CSforALL

https://www.csforall.org/

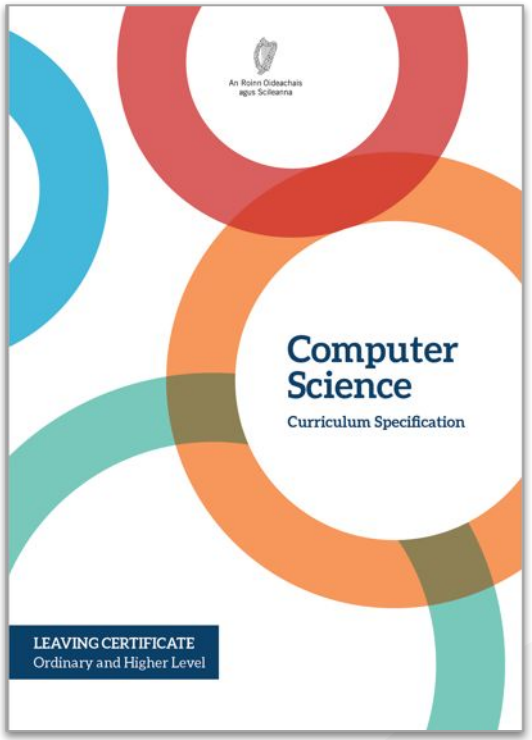


‘Students will explore the role that adaptive technology can play in the lives of people with special needs and how access to, and engagement with computing and technology is of ever-increasing importance to societies, democracies and human progress.

*LCCS Specification p*9

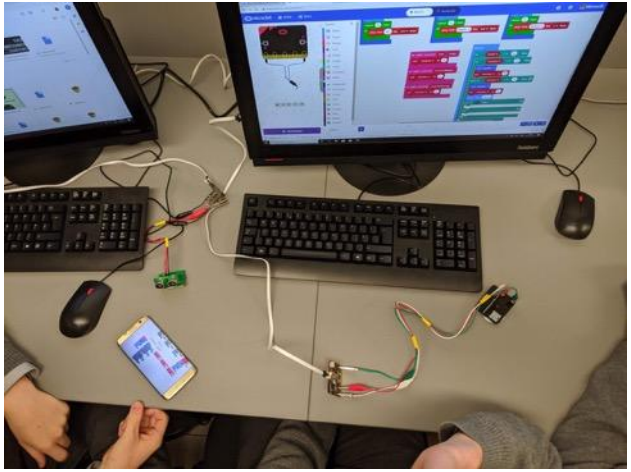
1.15 consider the quality of the user experience when interacting with computers and list the principles of universal design, including the role of a user interface and the factors that contribute to its usability.

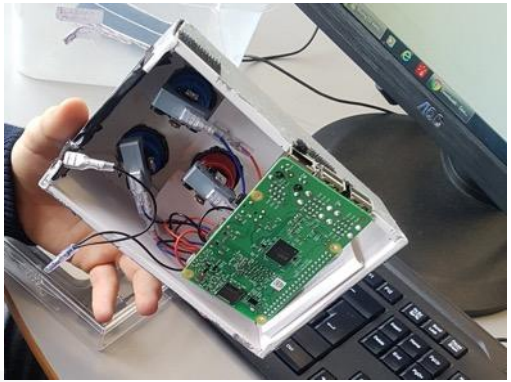
1.17 describe the role that adaptive technology can play in the lives of people with special needs.

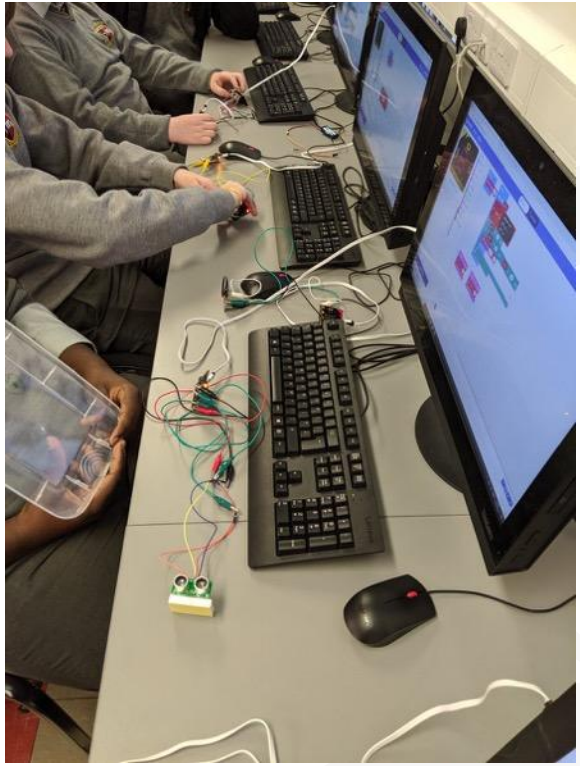


# Current Technologies

# LCCS Classroom







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# Discussion: SEN Supports

# Supporting your learners with SEN

*What supports might you put in place for students with SEN in your classroom? (refer to your non LCCS classes if needed)*

Go to **www.menti.com** and use the code **76 43 28**

Mentimeter

## What supports have you put in place for students with SEN in your classroom? (refer to your non-LCCS classes if needed)

https://www.mentimeter.com/s/7c783eebe2234b37237a3fb0119a1d38/8e93217c3249

# Discussion

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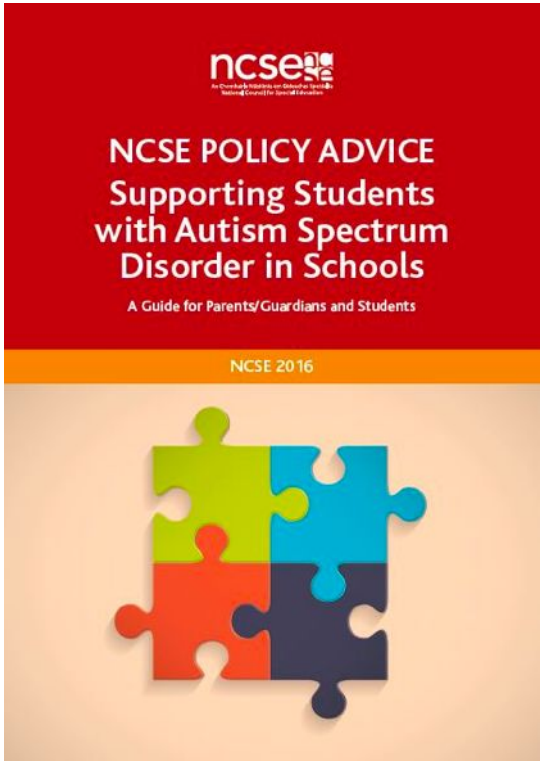
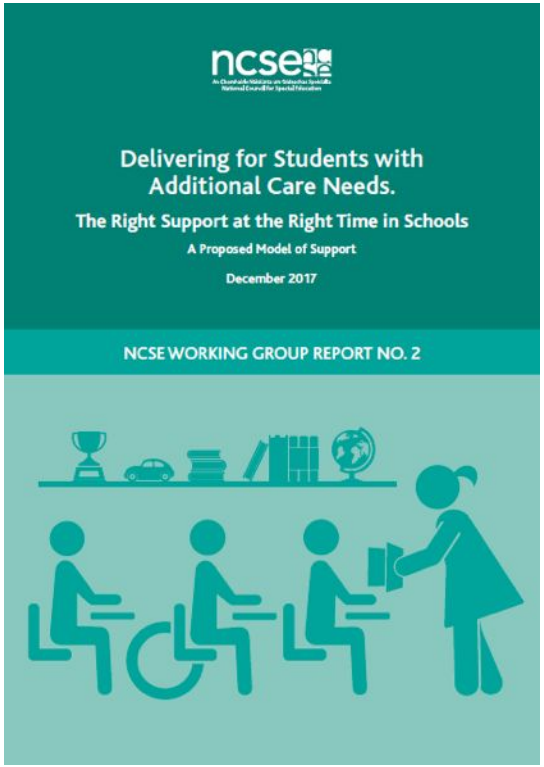
# SEN Guidelines & Resources

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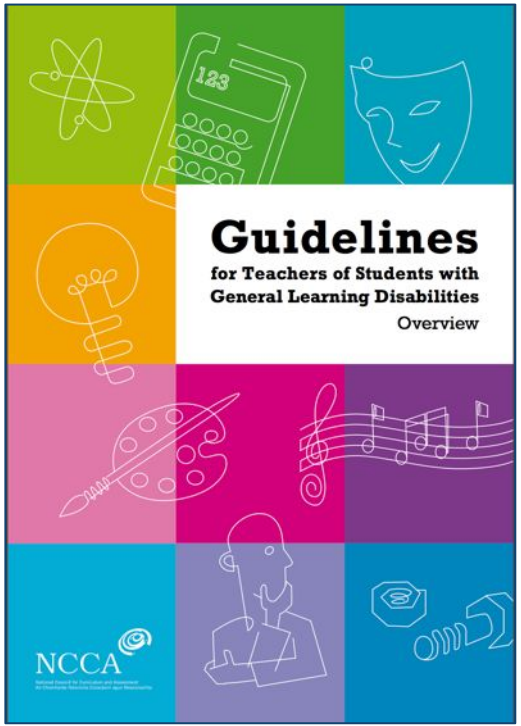
National Council for Special Education



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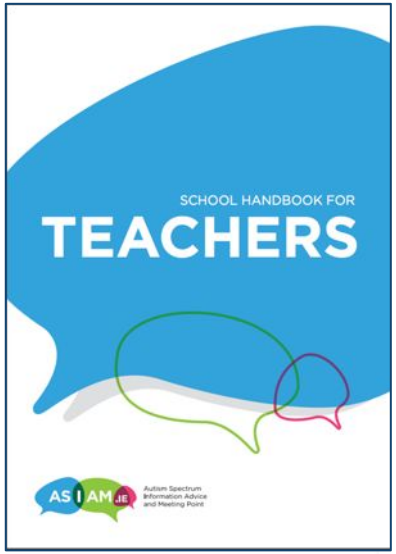
NCCA
An Chomhairle Náisiúnta Curaclaim agus Measúnachta
National Council for Curriculum and Assessment




**FACTSHEETS ON DYSLEXIA FOR SECOND LEVEL SCHOOLS**

| | |
|---|---|
| Factsheet 1 | What is Dyslexia? |
| Factsheet 2 | Screening and Identification |
| Factsheet 3 | Understanding the educational psychological assessment report |
| Factsheet 4 | The assessment report and its implications for learning |
| Factsheet 5 | Supports for students with dyslexia in Irish Education |
| Factsheet 6 | The dyslexia friendly school |
| Factsheet 7 | General classroom strategies for mainstream teachers |
| Factsheet 8 | Developing reading and comprehension skills across the curriculum |
| Factsheet 9 | Developing vocabulary and writing skills across the curriculum |
| Factsheet 10 | Mathematics: dyslexia and dyscalculia |
| Factsheet 11 | Teaching mathematics to students with dyslexia and/or dyscalculia |
| Factsheet 12 | Teaching languages to students with dyslexia |
| Factsheet 13 | Educational choices for students with dyslexia |
| Factsheet 14 | Making information accessible, the dyslexia-friendly style guide |
| Factsheet 15 | Computers and assistive technology |
| Factsheet 16 | How parents can support the student with dyslexia |
| Factsheet 17 | Study tips for the student with dyslexia including a section on resources |
| Factsheet 18 | Useful resources for teachers |

- General Considerations
- Deaf/Hard of Hearing
- Mental Health Difficulties
- Physical/Mobility Disability
- Specific Learning Difficulties
- Speech & Language Difficulty
- Blind/Visual Impairment
- Seizure Disorders

ahead

creating inclusive environments in education and employment for people with disabilities

**Assistive Technology - Tools and Applications**

1. Overview
2. Keyboards
3. The Mouse
4. Voice Recognition
5. Touch Screens
6. Switches and Scanning
7. On-Screen Keyboards
9. Visual Impairment
10. Hearing Impairment
11. Speech Impairment

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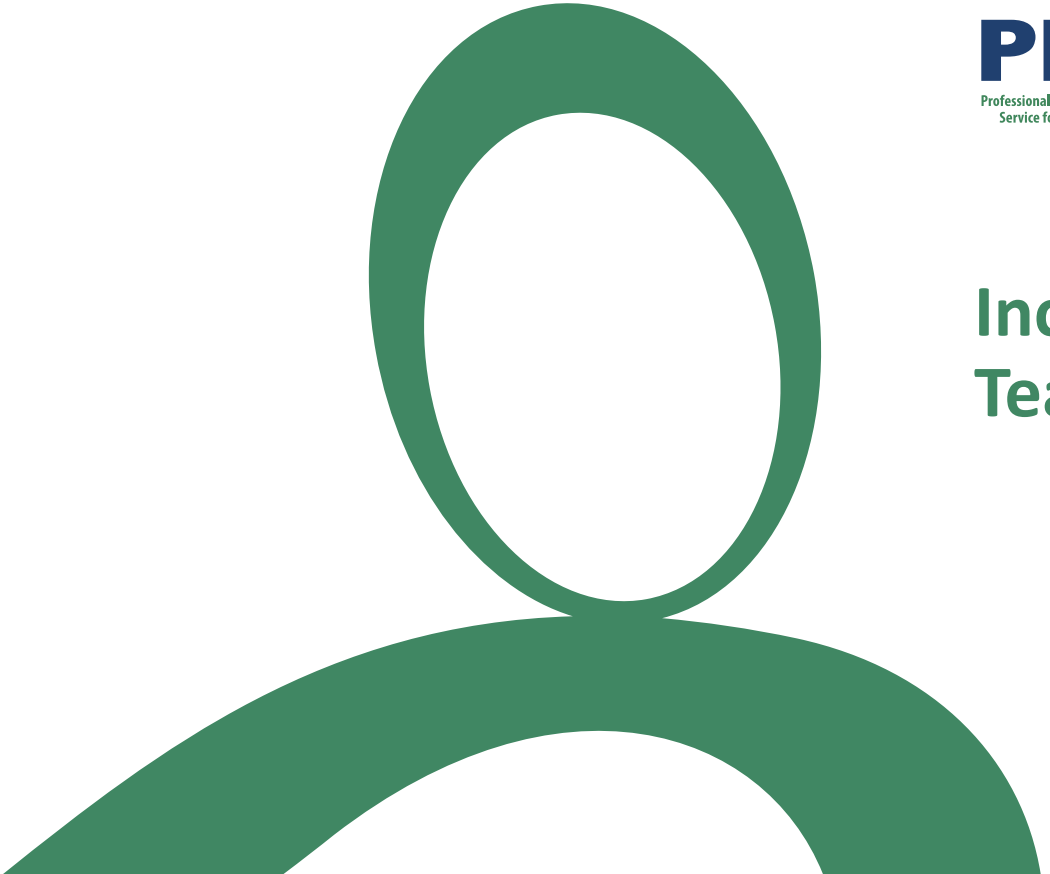
National Council for Special Education

NDA

# 5 minute stretch break

# LCCS Case Studies

# Teachers' Case Studies



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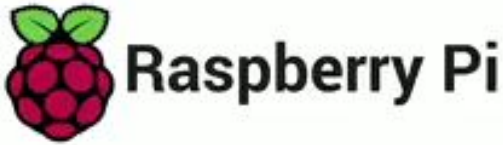
# Inclusive Approaches for Teaching CS

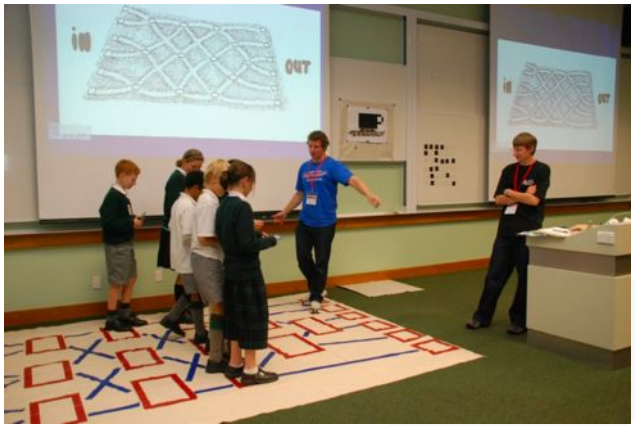
# 1 - Reduce Cognitive Overload


Raspberry Pi

# 2 - Unplugged Activities

Unplugged activities are tasks that take place away from a computer in order to model key concepts (e.g. selection, variables, algorithms) in different ways.

The term ‘unplugged’ originated with the CS Unplugged project in the 1990s, and it has become a popular approach to teaching computational thinking and other computer science concepts.



# Making the abstract tangible

Unplugged activities can help learners understand abstract concepts through physical objects that can be touched and/or manipulated.

By providing a physical representation, the learner can point to and ask the question at the level of the analogy rather than having to fully verbalise it at the technical level.

Can be of great benefit to learners with communication or learning difficulties who find abstract concepts difficult and require a multimodal approach.

Unplugged activities can include a range of sensory approaches, from physical movement to music and from manipulating objects to drawing pictures .

# Harnessing authentic and familiar contexts

Teachers can use familiar contexts to teach new concepts and knowledge through unplugged activities.

For example, you can introduce count-controlled loops through dance.

Topics can be set in a context that relates to a student's interests and pre-existing knowledge and understanding. Then that interest can drive their learning.

*Curzon et al. (2018, Computer Science Education, ed. Sentance et al.)*

# Generalising knowledge – making links

Teachers need to spend time helping students connect new knowledge, skills and strategies to different contexts rather than expecting that transfer will happen spontaneously.

An explicit link needs to be made between the unplugged activity and the computational model that it is helping to describe.

This is good practice for all learners but some learners with SEN may need extra support to make the connection.

For example:

When teaching the concept of selection using everyday instructions (for example, “If you have brown hair, then hop 3 times, else sit on the floor”).

Discuss why we use selection in programming, and trace through existing code together to find examples of selection.

Model the key language throughout the unplugged activity, to help as a prompt when revisiting the concept.

When moving on to programming activities, refer back to the unplugged activity.

# 3 - Physical computing

Physical computing involves interaction with the real world, through a physical system or object.

Physical computing devices generally provide a sensory output for the code, such as movement, sound, or lights, and some also have a physical interface. This tangible input and output helps learners make the connection between their code and the outcome of the program.

In his book *Mindstorms*, Seymour Papert referred to the original floor turtles as ‘objects-to-think-with’ (Papert, 1980).

Bee bot

Dash and dot

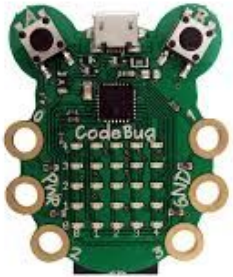
Sphero

Botley the coding robot

Code-a-Pillar

Lego Mindstorms

Arduino

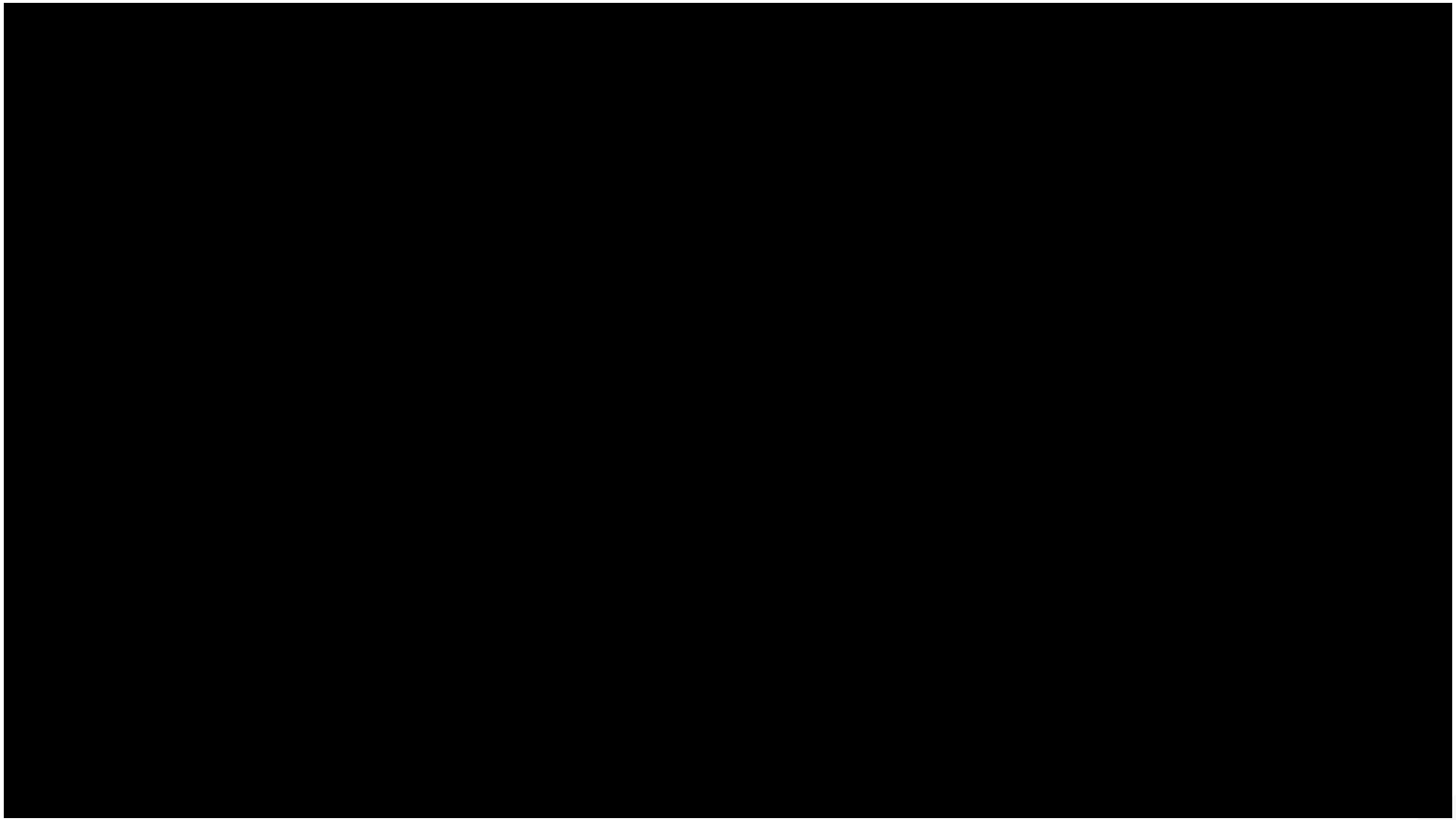



Codebug

Circuit Playground

Crumble

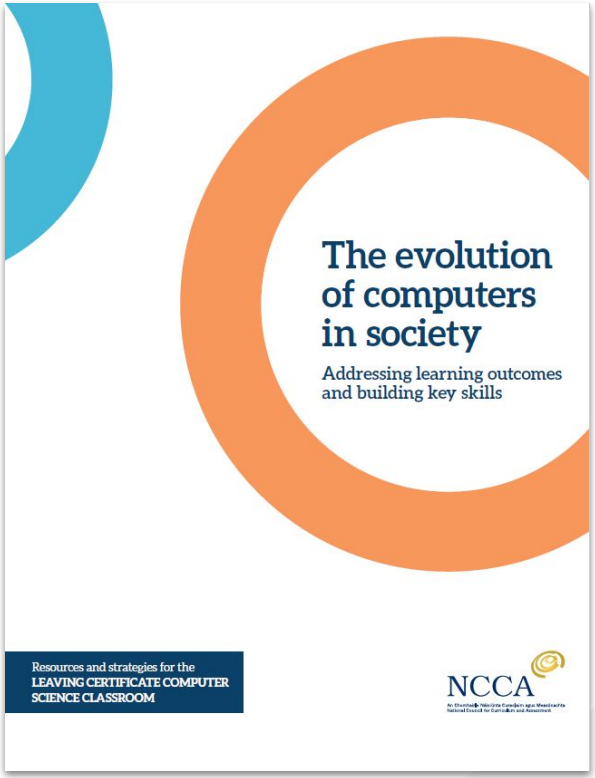
code jumper™
Project Torino Code View



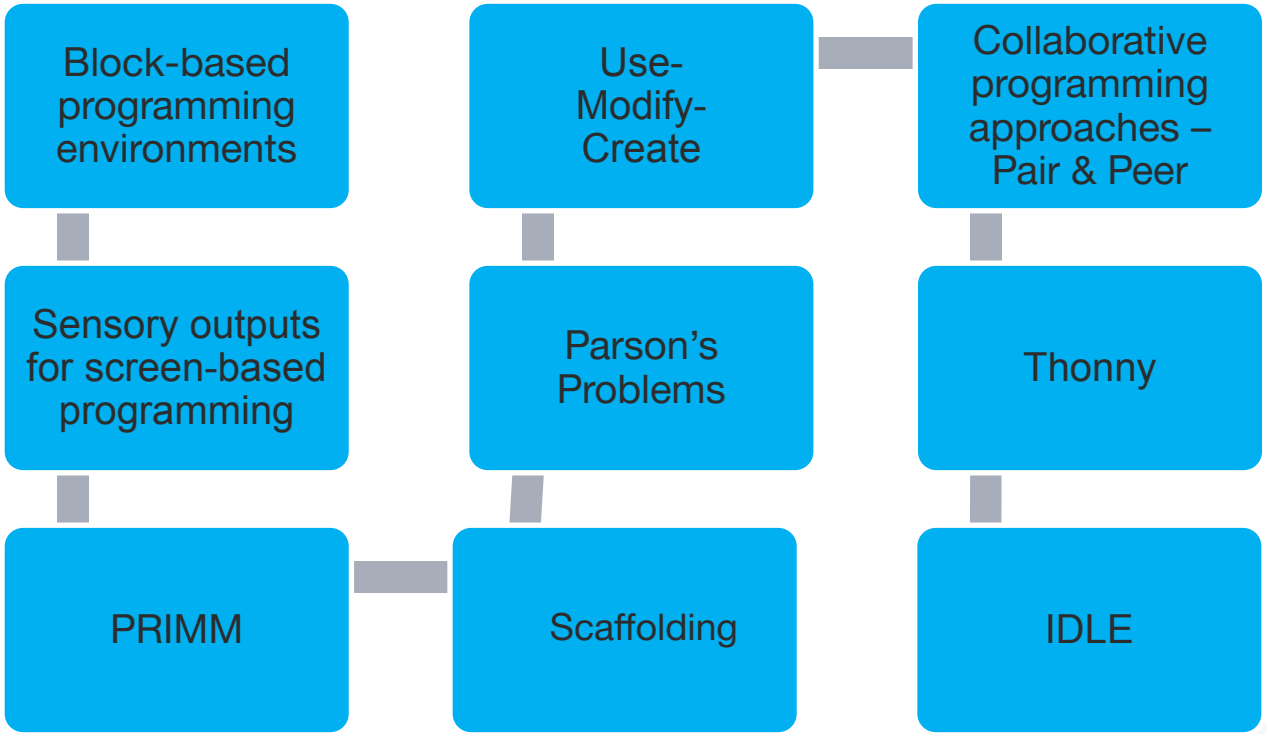
https://youtu.be/VdPTpv26ecM

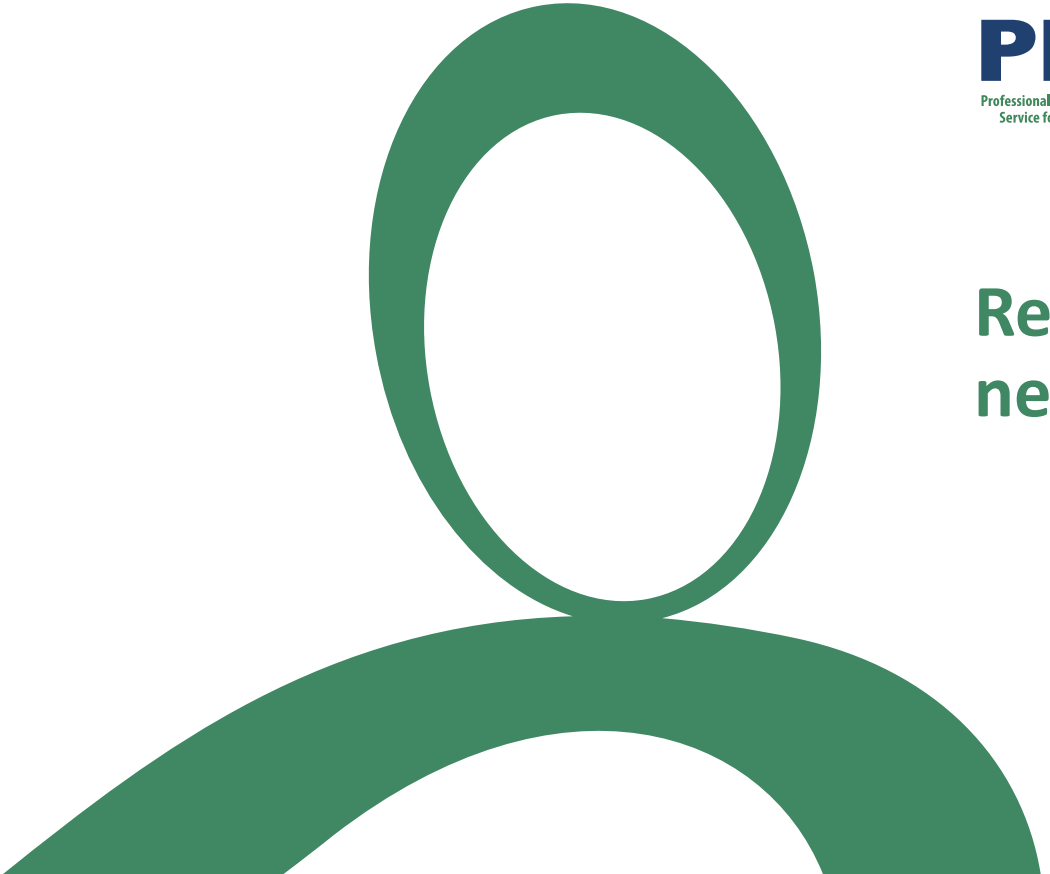
# 4 - Teach to the Emergent Skill

# 5 - Scaffold Group Work



# 6 - Tips for Supporting Programming


Block-based programming environments
Use-Modify-Create
Collaborative programming approaches – Pair & Peer
Sensory outputs for screen-based programming
Parson's Problems
Thonny
PRIMM
Scaffolding
IDLE



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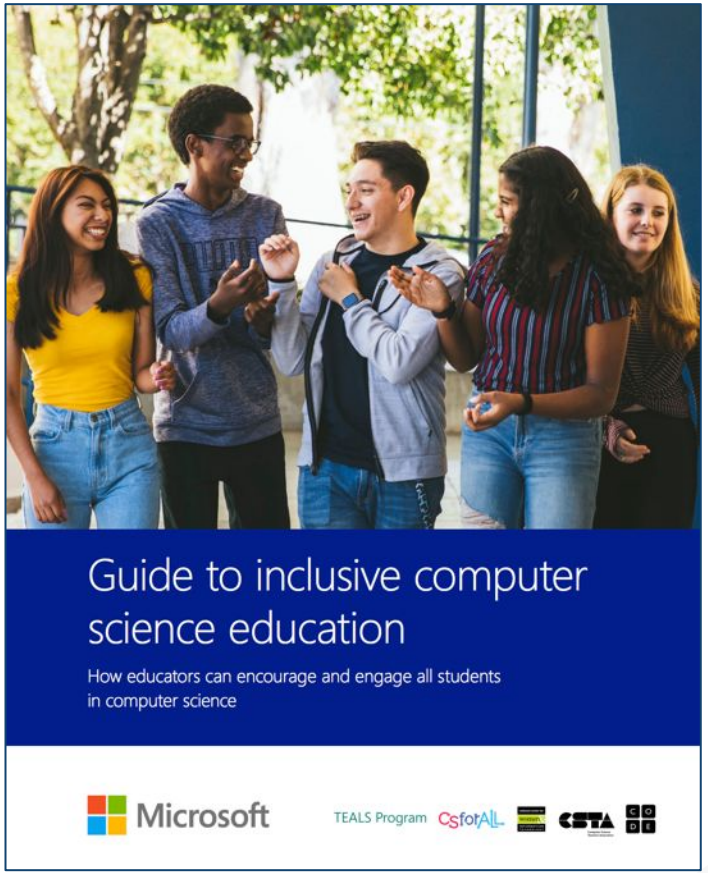
# Reframing your neurodiverse classroom

# 7 - Advantages of a neurodiverse classroom




https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RWuNMn

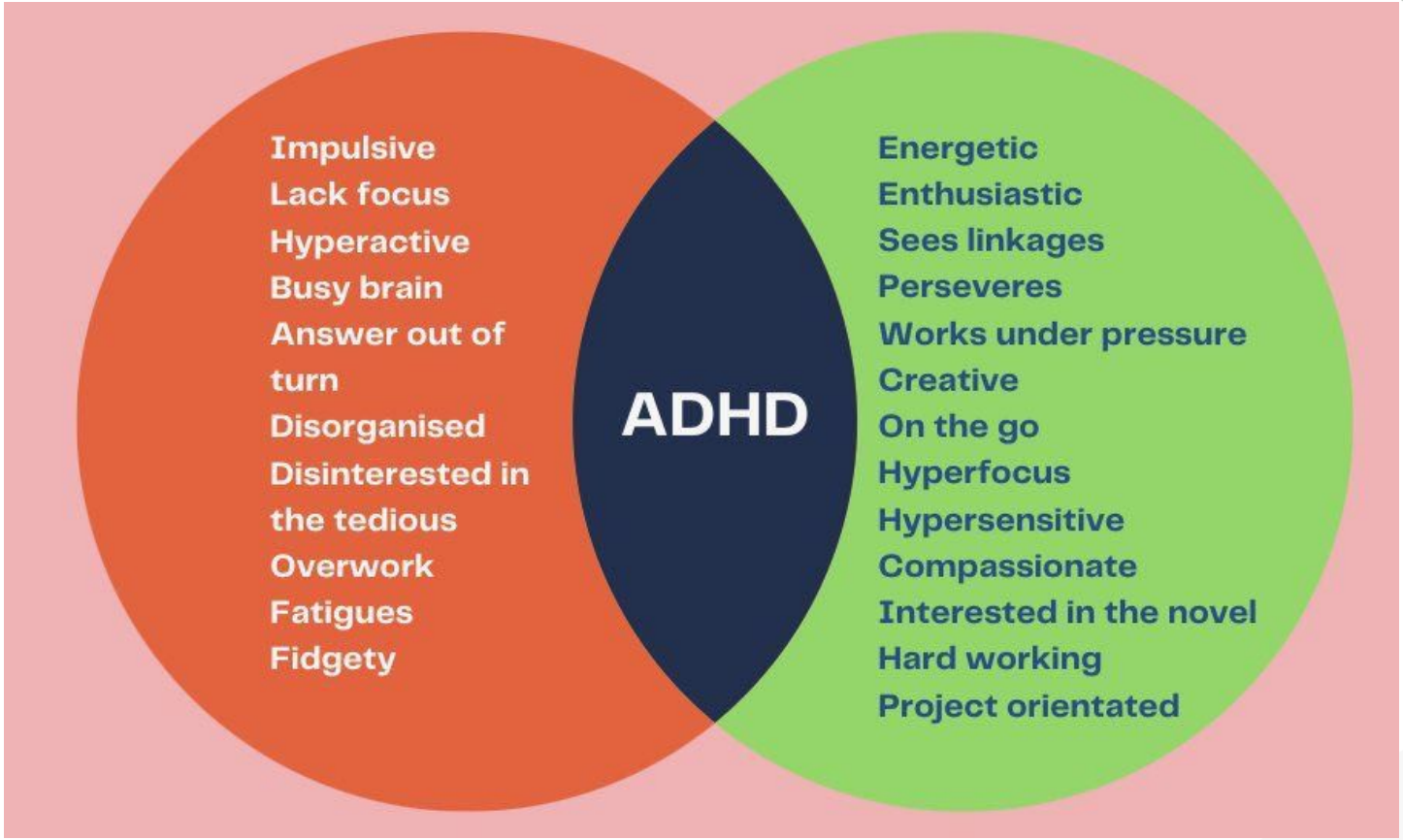
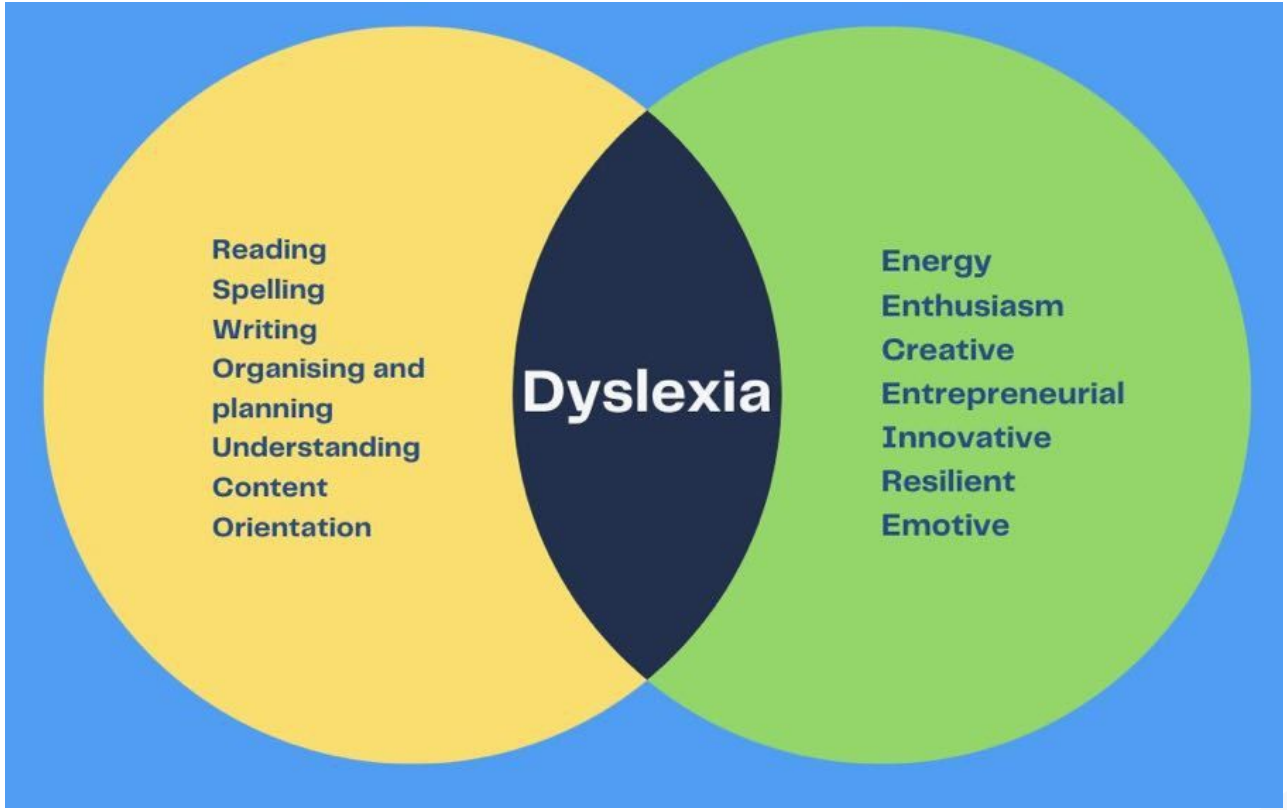



Image: Amanda Kirby, twitter.com/profAmandaKirby

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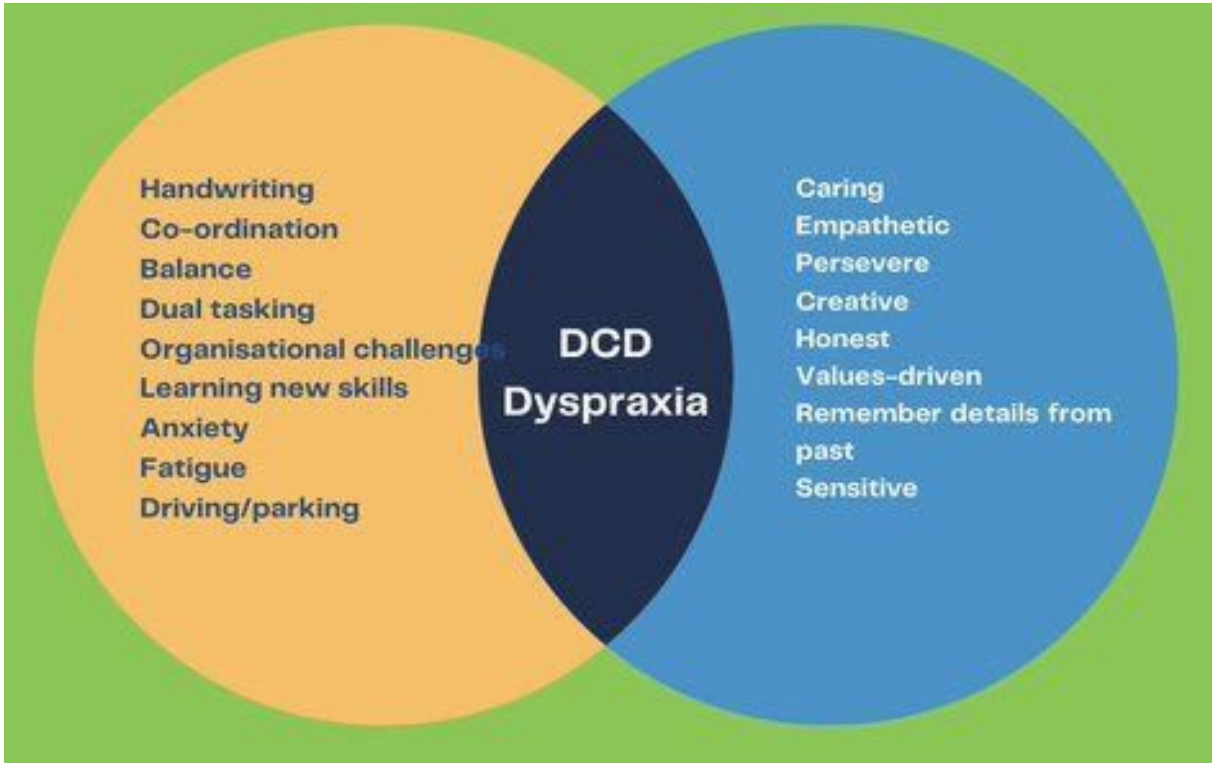
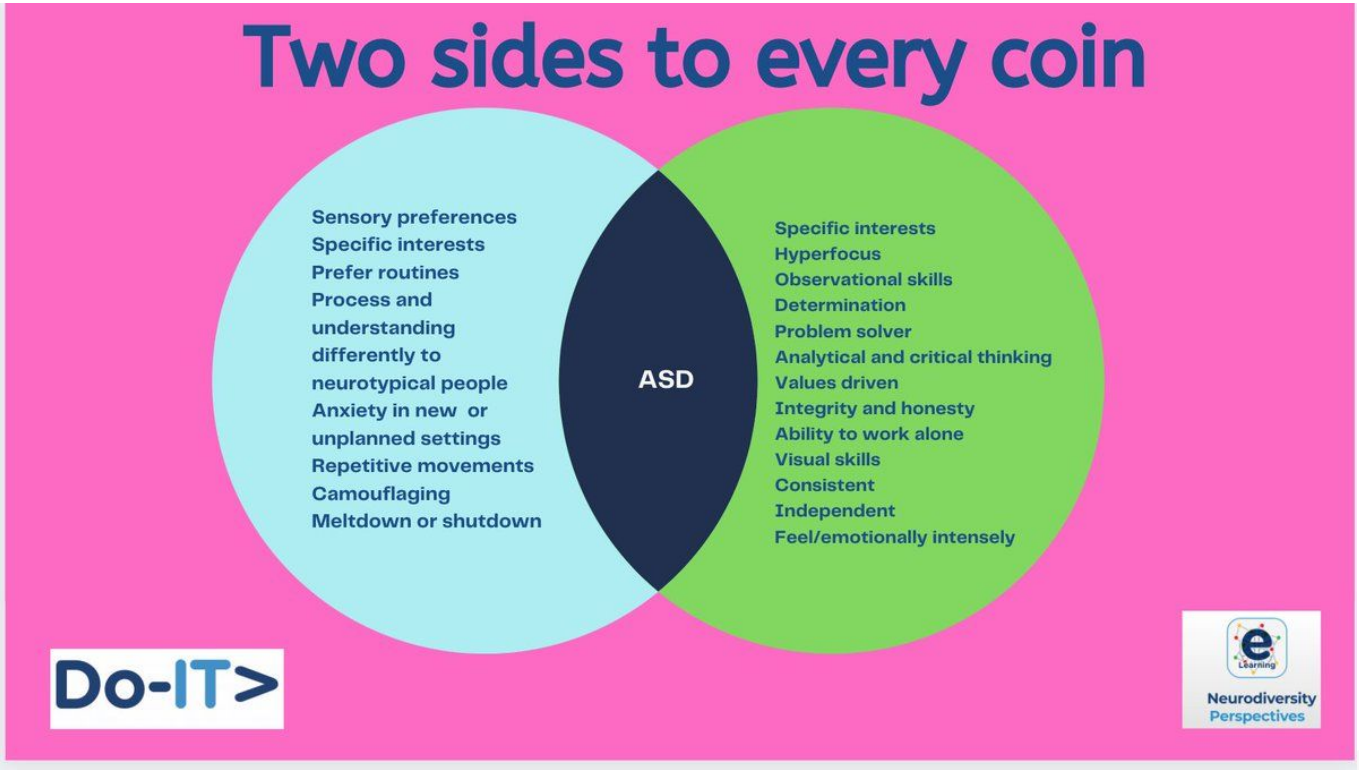



Image: Amanda Kirby, twitter.com/profAmandaKirby

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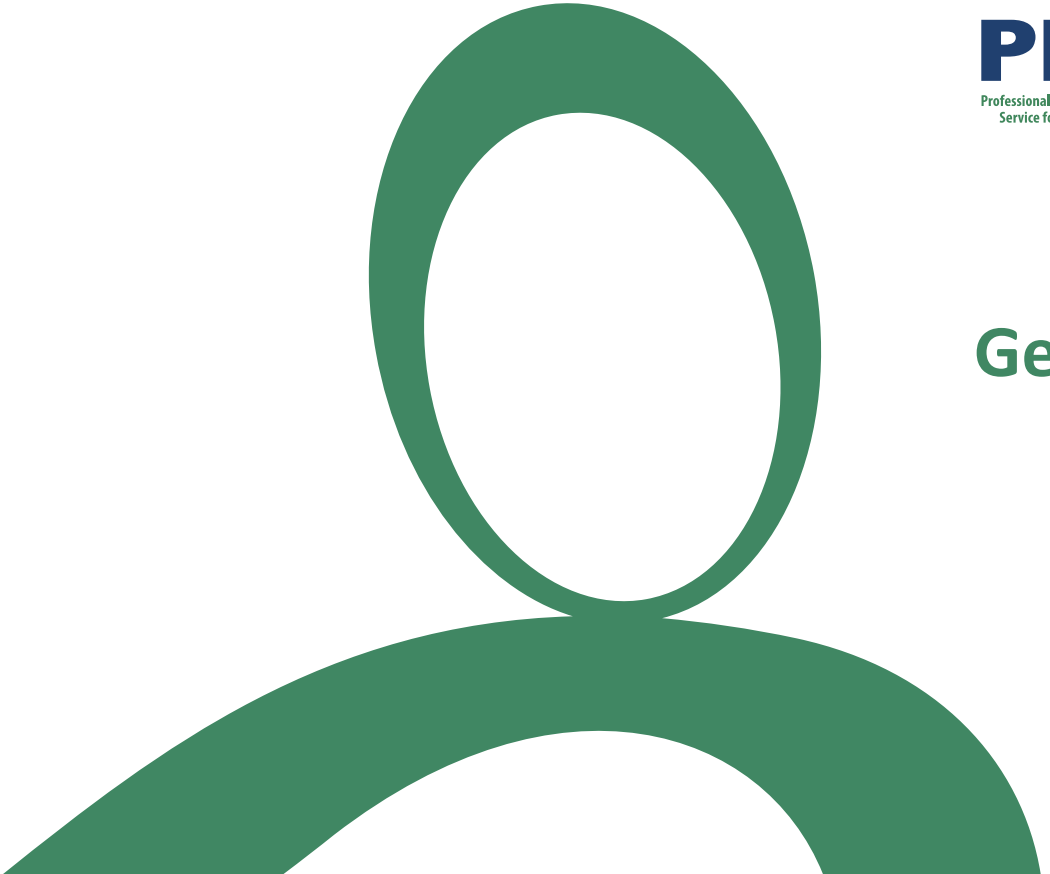

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# General Tips

Differentiate the learning experiences.

Encourage support for the student from classmates.

Consider physical access issues such as ramps, toilets, lifts and classroom layout.

Incorporate advice from the SEN coordinator in the school.

Use computers and audio-visual aids in the student's learning and teaching programme.

Specialised equipment may also be necessary such as adapted keyboards, page turners, word boards or special desks.

Encourage communication to prevent isolation.

Allow students extra time to complete tasks.

Students may have a low self-image, therefore it is important to ensure that the student feels included and is encouraged and praised.

As students tend to become distracted quite easily minimise distractions in the classroom environment.

Read each students' Student Support File and think about where LCCS fits into helping these students achieve the goals therein.

# Group Activity

# Group Task: Creating an Inclusive Classroom

Your LCCS classes each have a wide variety of students and most likely a number of students presenting with a wide variety of special educational needs. What supports might you need to put in place to create a classroom that includes these learners?

What are the challenges this student might face in engaging with the learning in your classroom?

What supports can you put in place to mitigate these challenges?

Consider also the strengths these students bring to the classroom - how might you use these to their - and your - advantage?

# Group Tasks

Group 1:

Autism Spectrum

Group 2:

Emotional/ Behavioural Disorder

Group 3:

Specific Speech and Language Disorder

Group 4:

Non-reader/writer

Group 5:

Attention Deficit Disorder

Group 6:

Dyspraxia

Group 7:

Profound sight loss

Group 8:

Dyscalculia

# 20 minutes

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# Presentation & Debrief

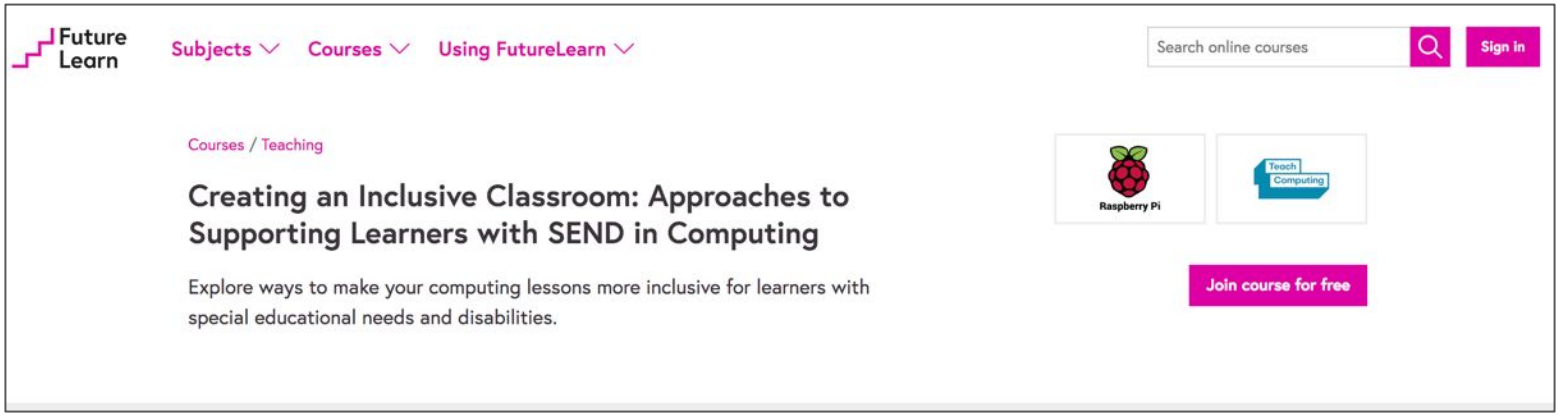
**What supports could be utilised?**

**What are your strategies for teaching CS? (theory & practical)**

**Can technology play a role?**

**Has this changed your thinking?**

# References:

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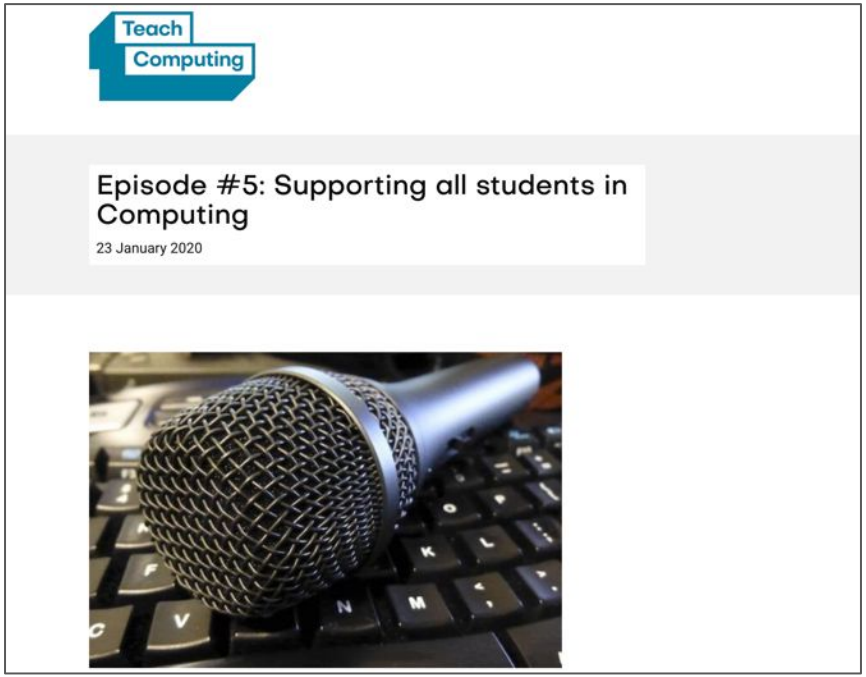


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