



SJIE4003 Overcoming Barriers to Specific Learning Difficulties

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Presentation Assessment: 2



Specific Learning Difficulty Numeracy - Dyscalculia

Dyscalculia Definition 1:

- “Dyscalculia is a condition that affects the ability to acquire arithmetical skills. Dyscalculic learners may have difficulty understanding simple number concepts, *lack* an intuitive grasp of numbers, and have problems learning number facts and procedures. Even if they produce a correct answer or use a correct method, they may do so mechanically and without confidence.”
(DfES,2001)

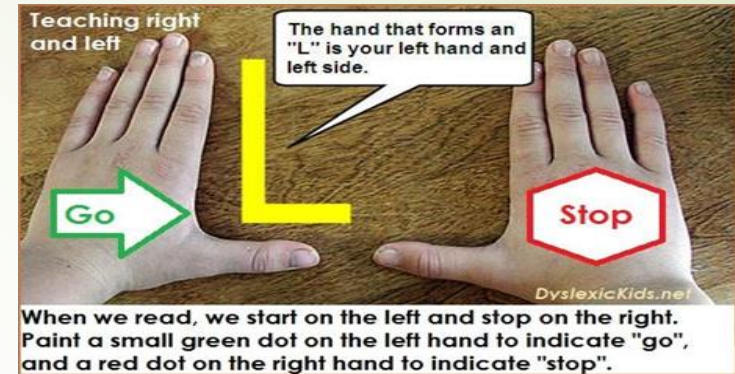
Dyscalculia Definition 2:

- “DSM-5 defines Dyscalculia as a specific learning disorder, an impediment in mathematics, evidencing problems with:
- Number sense
- Memorisation of arithmetic facts
- Accurate and fluent calculation
- Accurate math reasoning.” (APA,2013)

What are the signs of Dyscalculia?

Dyscalculia is not Maths anxiety.....

- Trouble learning to count. Struggles to connect No's to objects E.g. 3 apples to 3 cars, 3 biscuits etc.
- Difficulties with No bonds. E.g. $3+7 = 10$
- Continues to use fingers rather than mental maths.
- Confusion and misunderstanding of mathematical signs equals, plus, minus, times, divide, etc.
- Struggles to recognise that $3 + 5$ is the same as $5 + 3$ or may not be able to solve $3 + 26 - 26$ without calculating.
- Place value often putting No's in the wrong column.
- May not understand math's language or know where to start to solve a maths problem.
- Maths phrases such as *greater than* and *less than* are difficult to comprehend.
- Struggles keeping score in sports and or games. (The dyslexia Association, 2021)



Developmental dyscalculia

Abstract concepts, such as place value and number lines, can be very tricky for learners with dyscalculia. These need to be introduced gradually using concrete materials and pictorial representations before moving on to more abstract representations. This progression is the cornerstone of supporting learners with dyscalculia. It helps them to visualise the maths and to develop mathematical reasoning. It is an approach widely used throughout the world and the basis for Singapore Maths (see www.mathsnoproblem.co.uk), which has been responsible for catapulting Singapore to the top of the world league tables in Maths.

Suggested progression from concrete to abstract:

Real objects					
Pictures of real objects					
Counters/ cubes					
Chart	<table><tr><td>1</td><td>2</td><td>3</td></tr></table>	1	2	3	
1	2	3			
Line	<table><tr><td>0</td><td>1</td><td>2</td><td>3</td></tr></table>	0	1	2	3
0	1	2	3		

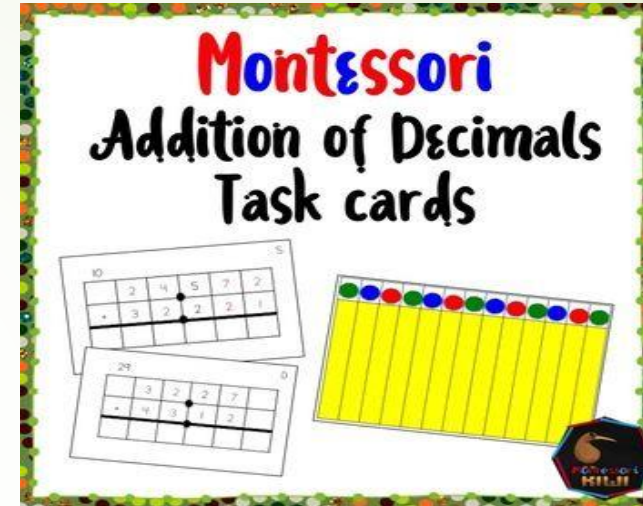
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What is Dyscalculia? 17
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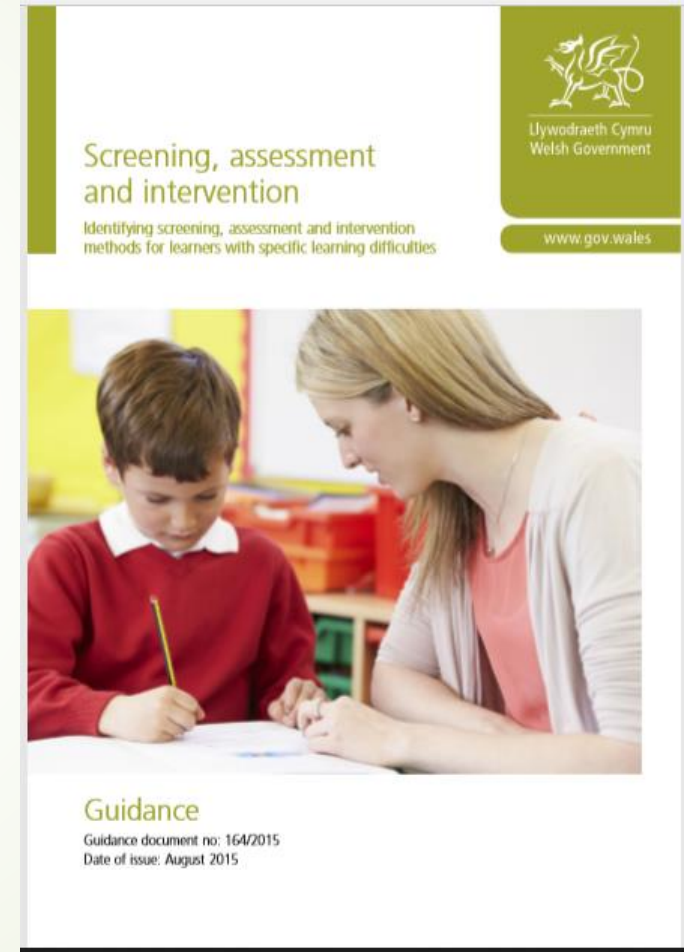
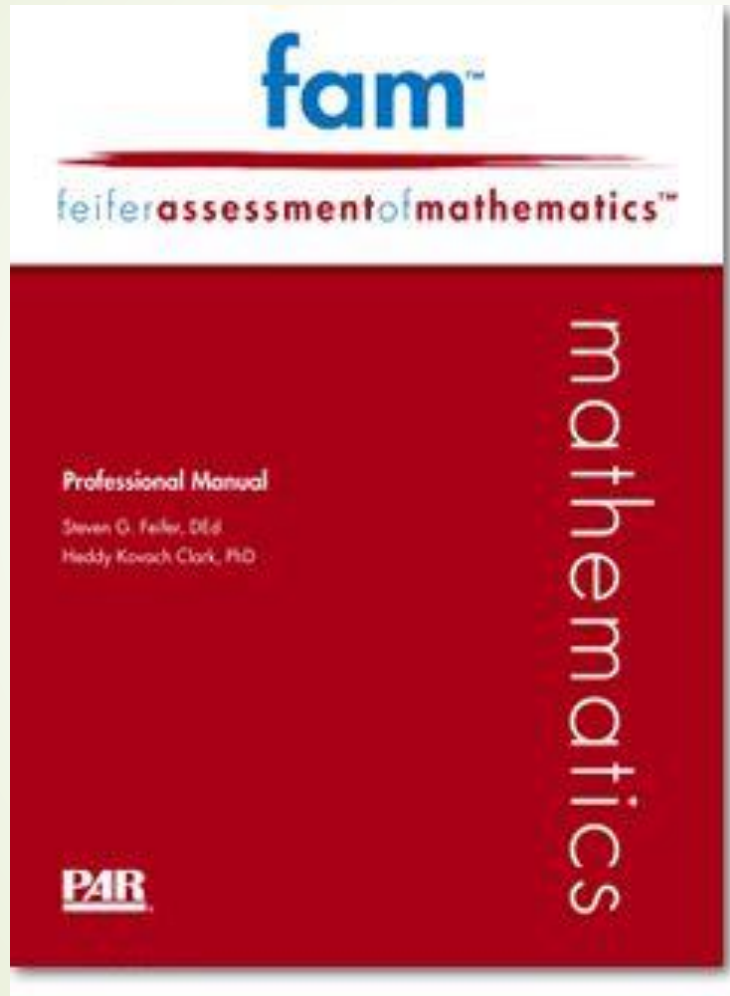
What are the signs of Dyscalculia?

Dyscalculia is on going and life impacting.....

- Struggles with handling money, budgets and transferring maths skills to obtain correct change.
- Avoid games that incorporates maths E.g. Monopoly.
- Charts and graphs are difficult.
- Unable to see similarities in the same maths solutions E.g. adding the length and width of a rectangle and doubling the answer to solve the perimeter is the same as adding all the sides.
- Struggles to learn and understand reasoning methods and multi-step calculation procedures.
- Trouble measuring ingredients for recipes E.g. using weighing scales, liquid in a bottle.
- May constantly get lost due to struggling with concepts of speed, distance and directions.
- Difficulty counting backwards, poor estimation. Addition is often the default operation. High levels of anxiety around numbers. (As Adults) (The dyslexia Association, 2021)



Screening for Dyscalculia



Jean Piaget Psychologist

09 Aug 1896 - 16 Sep 1980 (age 84)

What would Jean Piaget Think?



He wrote: *"The principle goal of education is to create men who are capable of doing new things, not simply of repeating what other generations have done - men who are creative, inventive and discoverers."*

What would he think of our PreK-college factory model system that is more concerned with rote learning than creativity, inventiveness, and discoveries?

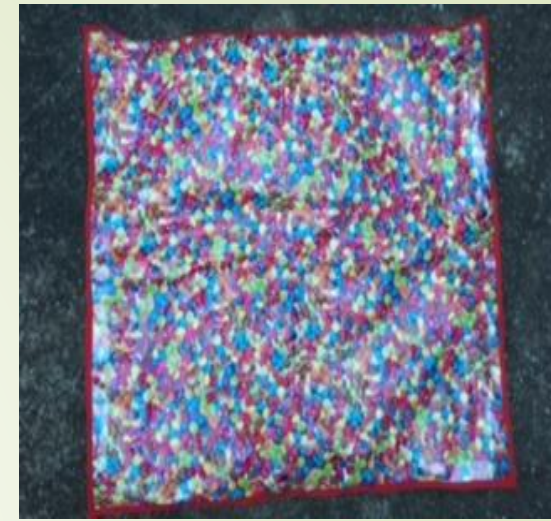
www.bing.com

- Cognitive Theorists –He believed we construct knowledge instead of receiving knowledge.
- Knowledge built by life experiences. In turn Influenced by emotional, biological & mental stages of development.
- Four stages of development;
 - Sensorimotor**- Learning through touch & feel.
 - Pre-operational** - Ability to arrange objects logical starts to develop
 - Concrete operational** – Ability to think logically about objects, events, starts to become more structured.
 - Formal operational** – Where abstract thinking and verbal reasoning starts to develop.

“ACKNOWLEDGE EFFORT AS WELL AS ACHIEVEMENT”

(Bates,2019)

Resources





Parental Feedback

- Diagnosed by LEA at 11 now 33 – No support for dyscalculia. Support for learning difficulties. Mainly focused on language. Statemented. Dyscalculia never supported. College very similar experience avoided any work to do with numbers.
- Young person diagnosed in school year 7 now 20. School psychologist assessed off the back of Mothers research and identifying dyscalculia. Received diagnosis of dyscalculia along with being statemented. 1:1 support until funding stopped. Put in lower set for maths. Eventually disappplied from GCSE maths which impacted on her A' level choices in 6th form. Tried sitting GCSE maths in 6th form but still no support or success. Felt let down as dyscalculia never supported. Impacted her education and life.
- Aged 13 had to go private for assessment as LEA refused!



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