Dyslexia or Dyscalculia?

Nanamic July 2016

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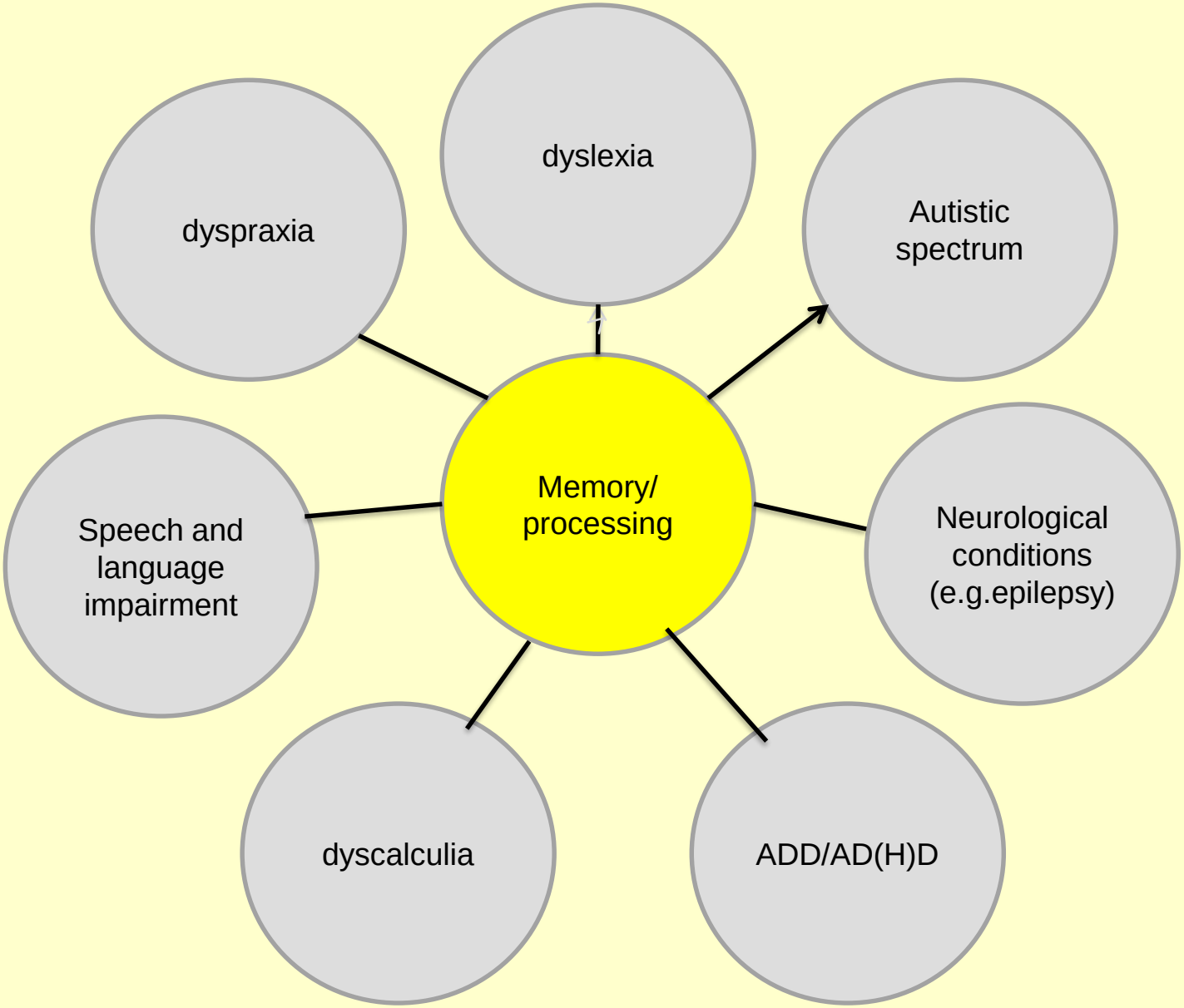
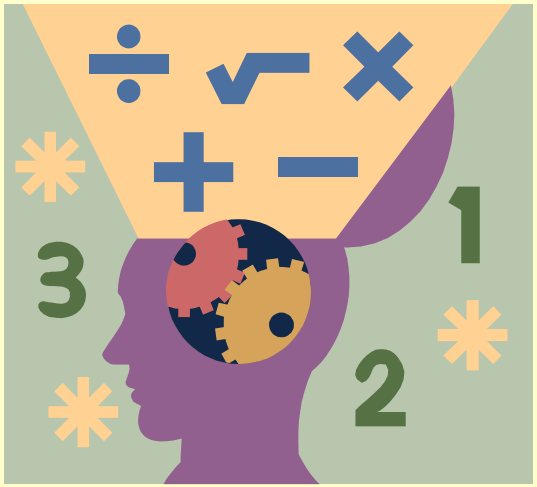
Neurodiversity



Dyscalculia



Do you know that there are 3 types of Mathematician: Those that can add up and those that can’t!

What is dyscalculia?

“Students with Dyscalculia may have difficulty in understanding simple number concepts, lack an intuitive grasp of numbers and have difficulties learning number facts and procedures. British Dyslexia Association

“Difficulty with counting” Bakwin and Bakwin (1960)

Who has dyscalculia?

- About 5% of the population
- Can co-exist with other disabilities; dyslexia, dyspraxia
- **But** - the student may have no difficulties with reading, writing, practical tasks

Typical difficulties

- Basic computation of +,−, ÷ and ×
- Does not know which operation to use
- Place value – what a number represents
- Measuring and weighing
- Time
- Money
- May be able to understand concepts but not carry out calculations.
- Cannot understand abstract concepts – needs practical demonstration

The DSM-IV (2000) definition of ‘Mathematical Disorder’ is:

“ as *measured by a standard test that is given individually, the person’s mathematical ability is substantially less than would be expected from the person’s age, intelligence and education. This deficiency materially impedes academic achievement or daily living.”*

The National Numeracy Strategy (DfES 2001) definition of dyscalculia is:

"*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*

SD	**-2**	**-1**	**0**	**+1**	**+2**
SS	**70**	**85**	**100**	**115**	**130**
Percentile rank	**2**	**16**	**50**	**84**	**98**
	≤ Average	Average	Range	≥ Average	
Verbal Abilities				**x**	
Visual Abilities				**x**	
Auditory memory			**X**		
Visual processing			**X**		
Reading				**X**	
Maths	**X**				
Speed of reading			**X**		
Comprehension				**X**	
Spelling			**X**		
Free writing wpm			**25 wpm**		
Phon. Awareness				**X**	
Phon. memory			**X**		
Rapid Naming			**X**		

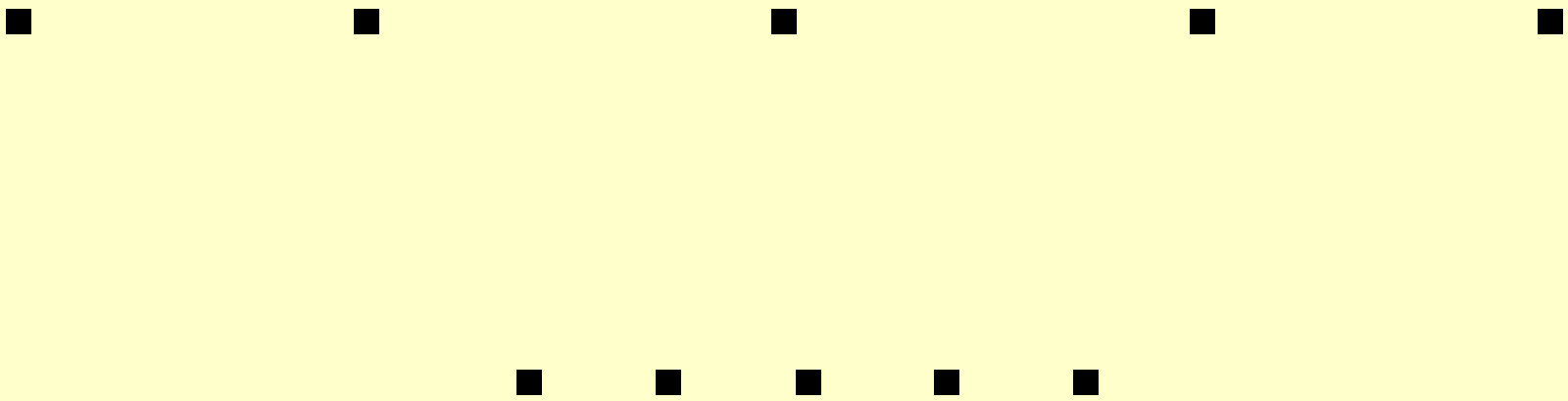
Recognising dyscalculia

- Cannot count backwards in groups
- Cannot recognise that 7 in 76 represents 70
- Difficulty with decimals, negative numbers, converting weights and measures (e.g. Kg to g)
- Cannot apply times tables if learned by rote
- Starts at zero when adding numbers- cannot add on
- Difficulty using measuring, weighing equipment
- No concept of size

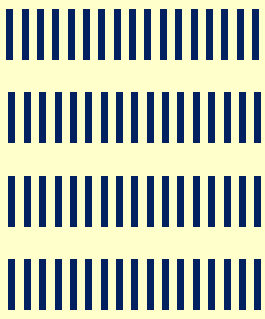
Dyscalculic errors

- 200010070 for 2,170
- Thinks 0.7 is smaller than 0.67 as 67 is a larger number
- Does not start from 0 on ruler when measuring. Does not understand interval values on ruler and scales.
- Cannot subtract by counting backwards
- Does not understand that 2 x 3 is the same as 3 x 2
- Cannot do mental arithmetic
- Cannot estimate – may not be able to check answers on calculators

Which line has the most dots?



Test responses

17 x 4 =  68

$\frac{15}{5} = \frac{1}{3}$

823

X 45

1378

12670

14048

1 1

Two thousand four hundred and seven

20004007

Definition of Dyslexia

Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling.

- Characteristic features are difficulties in phonological awareness, verbal memory and verbal processing speed.

- Occurs across the range of intellectual abilities.

- It is best thought of as a continuum, not a distinct category, and there are no clear cut-off points.

- Co-occurring difficulties may be seen in aspects of language, motor co-ordination, mental calculation, concentration and personal organisation, but these are not, by themselves, markers of dyslexia.

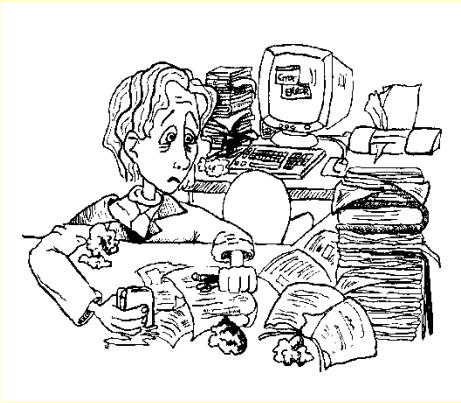
- A good indication of the severity and persistence of dyslexic difficulties can be gained by examining how the individual responds or has responded to well founded intervention.

Rose Report 2009

Characteristics of dyslexia

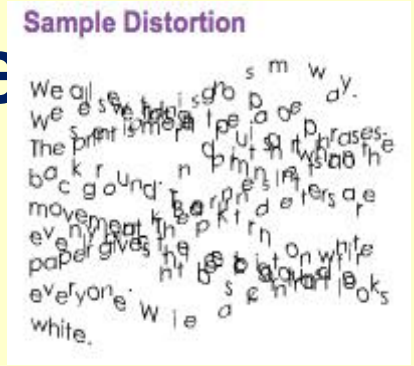
- Phonological processing
- Efficient retrieval of information (rapid naming)
- Short term auditory and working memory
- Processing speed
- Visual memory and processing
- Attainment or automatic development of skills may not match up to the student's underlying abilities.

Dyspraxia



- Physical and intellectual co-ordination proble
- Weak hand/eye coordination
- Clumsy movement/poor balance
- Difficulties with orientation and direction
- Poor fine motor control e.g. handwriting, drawing
- Difficulties organising thought and language
- Easily distracted by background noise and visual distractions; will get lost in a process if interrupted
- Poor memory and concentration
- Difficulties following instructions
- Difficulty in matching theory to practice
- Weak time management skills
- Poor organisational skills

Meares-Irlen Syndrome (Scotopic Sensitivity)

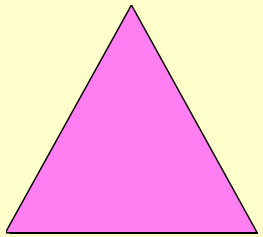


This is an oversensitivity in the brain to light and colour. Signs include:-

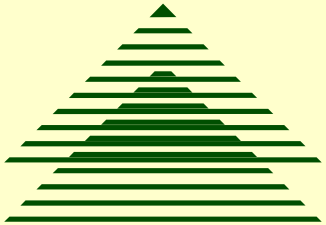
- Oversensitivity to sunlight and or fluorescent lighting
- Black print on white paper is uncomfortable to read
- Whiteboards are too shiny
- Print disappears when being read or moves about

Mears Irlen syndrome

- Itisverydifficulttoreadsentenceswithoutgapsinthel etters
- And if this:

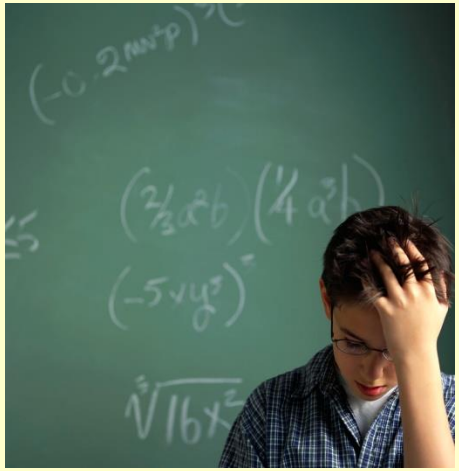


Looks
like this!

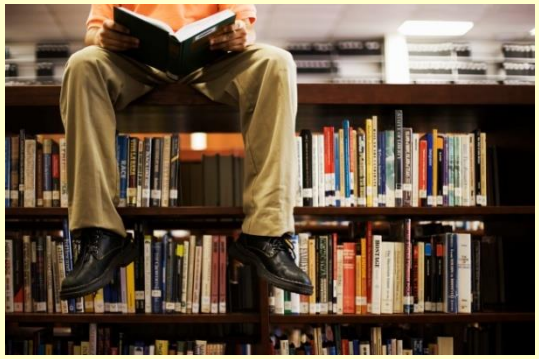


SpLD and Maths learning

Which of the following do your students find challenging?



Reading



- Decoding
- Misreading similar-looking words
- Comprehension
- Maths vocabulary and everyday words (take away)
- Symbols
- Copying

Writing/Motor skills

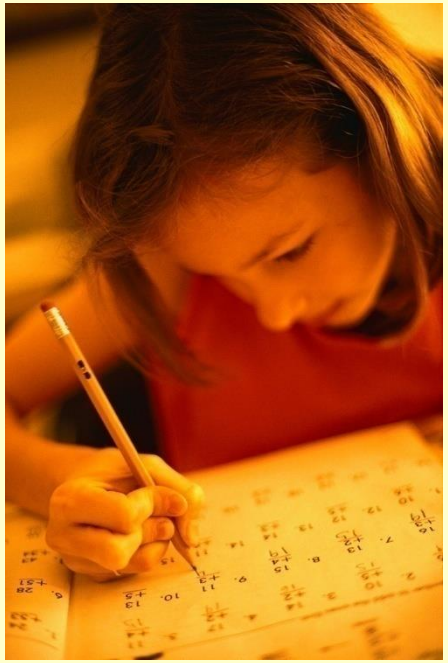
- Spelling
- Copying
- Translating ideas into writing
- Geometry
- Constructing charts
- Using equipment of any kind!

Memory

- Tables
- Formulae
- Relationships between numbers
- Maths language/terminology.
- Some students may only be able to remember 3 pieces of information – the 2 times table contains 10!

Sequencing

- Place value
- Ordering numbers
- Time
- Tables



Teaching strategies

•Give explanations in small steps; chunking and checking'/ 'little and often'

•Ensure understanding has taken place before moving on

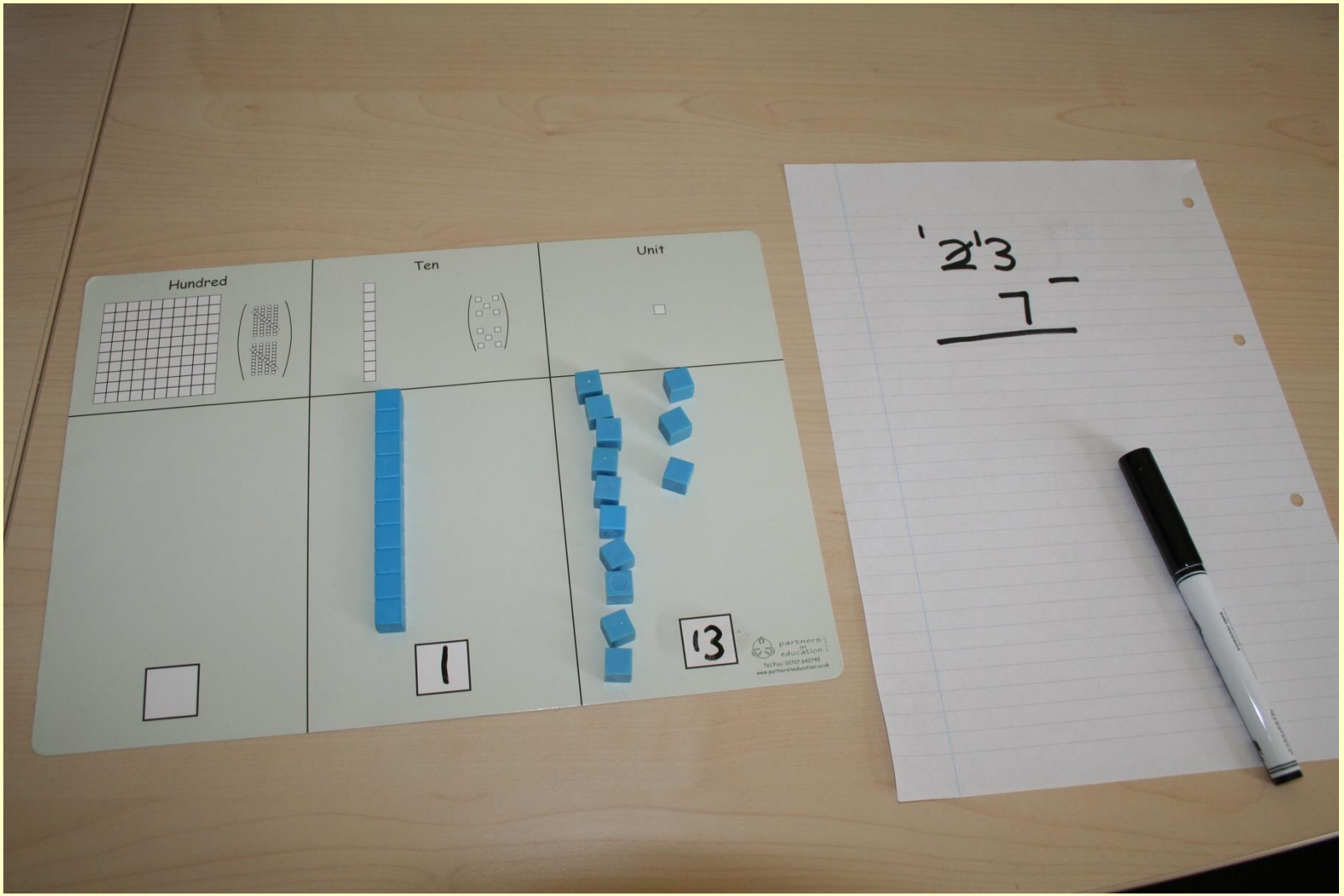
•Reinforcement (by different methods if necessary)

• Use practical and visual examples - anything goes if the student learns!

- Frequent rest breaks to absorb information
- Allow all students to use calculators, fingers, equipment that works for them.
- Repetition/revision
- Give materials/PPts to read in advance
- Repetition/clarification/use of unambiguous language
- Personalise information

Multi-sensory teaching

- ‘Concrete’ materials – Dienes Apparatus, Cuisenaire Rods, money, measuring tapes, jugs and scales, flexitables, counters, fraction ‘pies’, fingers, rulers, materials used in your teaching area.
- Visual materials- number lines, place value and equivalent fraction sheets, squared paper (may not be suitable for students with Mears-Irler) multiplication squares
- Any materials can be age-appropriate if presented in the right way!


Hundred
Ten
Unit
1
13
partners in education
13
7

Suppliers

- **Crossbow Education** (reading rulers, materials)
  www.crossboweducation.com

- **Iansyst** (assistive technology)
  www.dyslexic.com

- **Partners in Education** (materials, books)
  www.partnersineducation.co.uk

- **The Dyslexia Shop** (materials, books)
  www.thedyslexiashop.co.uk