

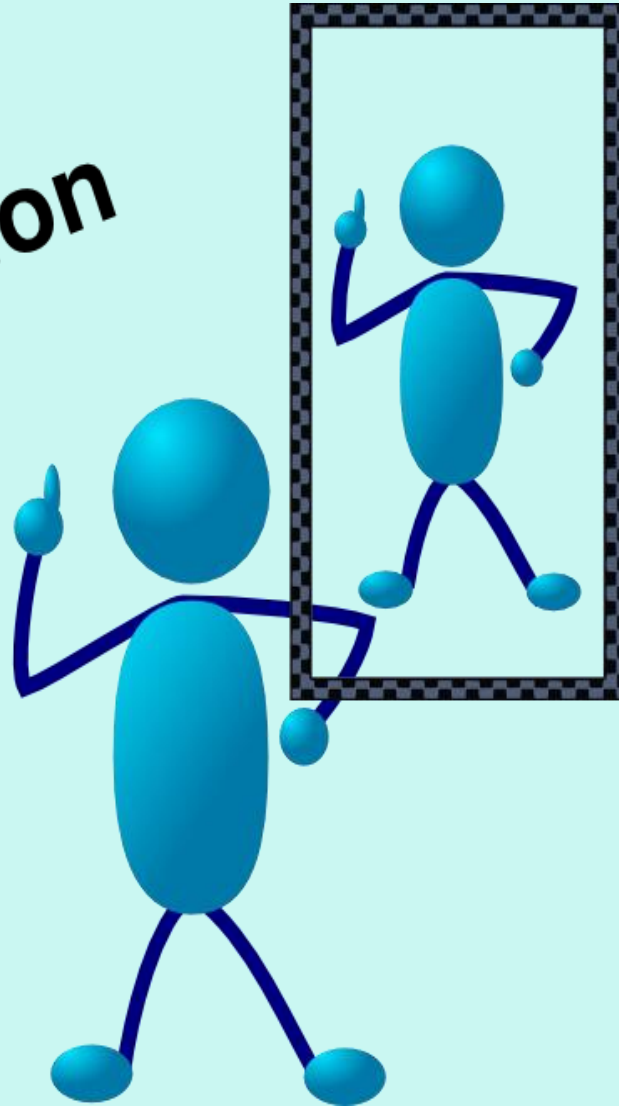


Kingsfield Primary School

The *Active Learning* Trust

SEND CPD: An Introduction to Working Memory

Self- Evaluation



Please grade your current knowledge and confidence one scale of 1 to 10.

This presentation has been developed through collaboration between:

**Professor Susan Gathercole and Dr Joni Holmes
at the Centre for Attention, Learning & Memory
(CALM) based in the Cognition & Brain Sciences
Unit, Chaucer Road, Cambridge**

and

**The Specialist Teaching Team
SEND Specialist Services, Cambridgeshire**

AIMS OF SESSION

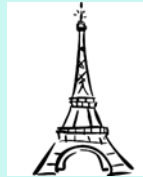
- ◆ to provide an overview of working memory
- ◆ to increase staff knowledge of the features of working memory difficulties and how they may present in a child
- ◆ to be aware of (often small) adjustments which can be made to address pupils' working memory difficulties

Different types of memory (some examples)

Procedural



Semantic



Autobiographical



Episodic



Short term



Working

WORKING MEMORY

Definition:

.... is the term used by psychologists to refer to the ability we have to hold and manipulate information in the mind over short periods of time

Ref: Understanding Working Memory – A Classroom Guide by Gathercole and Alloway

In classroom terms - how a child stores information he or she needs to complete a task

WHEN DO WE USE WORKING MEMORY?

Trying to remember information while searching for a pen to write it down

Following spoken directions

Calculating how much our shopping basket will cost

Remembering an unfamiliar foreign name of a person you have just been introduced to

Measuring and combining the correct amounts of ingredients when baking

KEY FACTS

Does working memory ability keep on increasing with age?

Increases from 4-14 years

Do children of the same age have roughly the same WM capacity? *No – there is a big variation within children of the same age*

Is working memory limited in capacity? **Yes – it is limited.**
Distractions can affect and once gone it is lost forever

Is there a link between WM and ability to learn and academic attainment? *Yes – WM is a better predictor of educational success than IQ.*

How much information can the average adult hold in WM?

Typically 6-7 units

Is WM ability hereditary?

Yes

What percentage of children diagnosed with WM deficit are likely to be boys/girls?

Boys 52% girls 48%

What behaviours do boys/girls tend to display when WM difficulties are present?

Girls tend to daydream. Boys tend to act out and have irritating behaviours

DEFICITS IN WM ARE COMMON FEATURES IN:

Dyslexia

ADHD

Developmental Language Disorder

Reading and mathematical difficulties

**However, WM deficits can also occur in the absence
of a diagnosed condition!**

WHAT DO I LOOK OUT FOR IN THE CLASSROOM?

- ◆ A child who is making poor academic progress, particularly in maths, reading and writing
- ◆ Difficulties working out maths problems in their head or with reading retention.
- ◆ A child who is reserved in groups and rarely volunteers answers
- ◆ A child who has difficulties in following instructions and remembering messages
- ◆ A child who tends to lose track in complex tasks and may even eventually abandon
- ◆ A child who has problems with activities that combine storage and processing
- ◆ A child who has place-keeping difficulties eg in writing
- ◆ A child who has short attention span and is highly distractible
- ◆ Poor self-esteem

What might you hear staff saying?

“He’s in a world of his own”

“She doesn’t listen to a word I say”

“He doesn’t pay attention and distracts others”

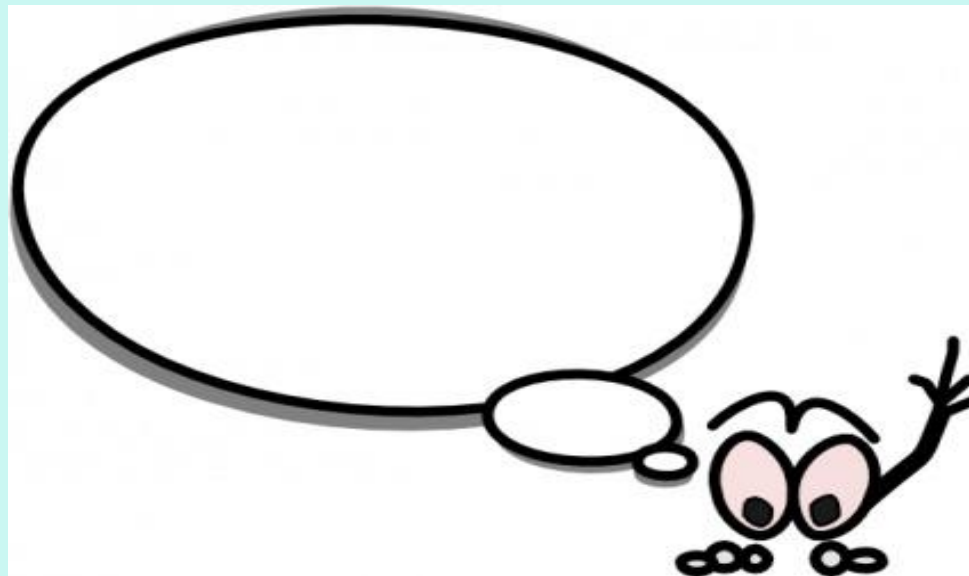
“She’s always day-dreaming”

“With him, it’s in one ear and out the other”

HOW CAN WE SUPPORT CHILDREN IN THE CLASSROOM WHO HAVE WORKING MEMORY DIFFICULTIES?



METACOGNITION



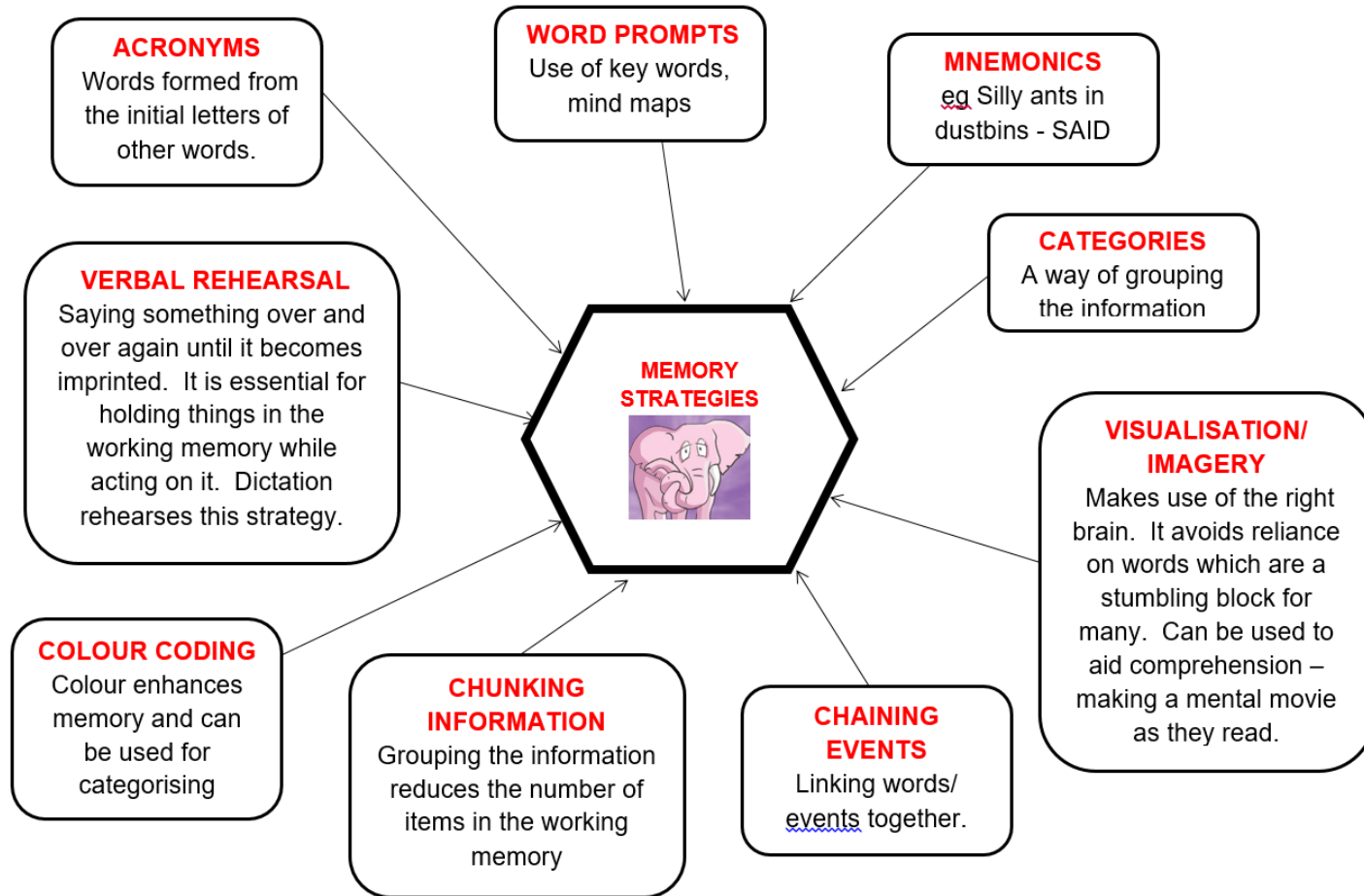
thinking about thinking.....

metacognition strategies are aimed at children under 8 years of age.
Memory aids for younger children.

ACTIVITY



- ◆ tree
- ◆ righteous
- ◆ bed
- ◆ snake
- ◆ Sharon
- ◆ green
- ◆ patio
- ◆ lion
- ◆ exchequer
- ◆ hiccup
- ◆ skip
- ◆ scorpion
- ◆ save
- ◆ brother
- ◆ blight
- ◆ proud
- ◆ big
- ◆ David
- ◆ hop
- ◆ Osborne
- ◆ cheque
- ◆ butterfly
- ◆ camel
- ◆ jump
- ◆ brown
- ◆ executive
- ◆ slight
- ◆ mango
- ◆ Corbyn
- ◆ bench



MONITOR THE CHILD AND LOOK FOR WARNING SIGNS

Signs – eg

- incomplete recall
- failure to follow instructions
- task abandonment



Talk to the child – ask what they are doing and what they are to do next

EVALUATE WORKING DEMANDS OF ACTIVITIES



Modify activities to avoid asking a child to perform a challenging mental activity at the same time as storing information

Beware of asking a child to:

- remember sequences, lengthy instructions, lengthy sentences
- keep track of place in multi-step tasks



*Encourage
use of
memory
aids*

..... **TEACH**

..... **HAVE TO HAND**

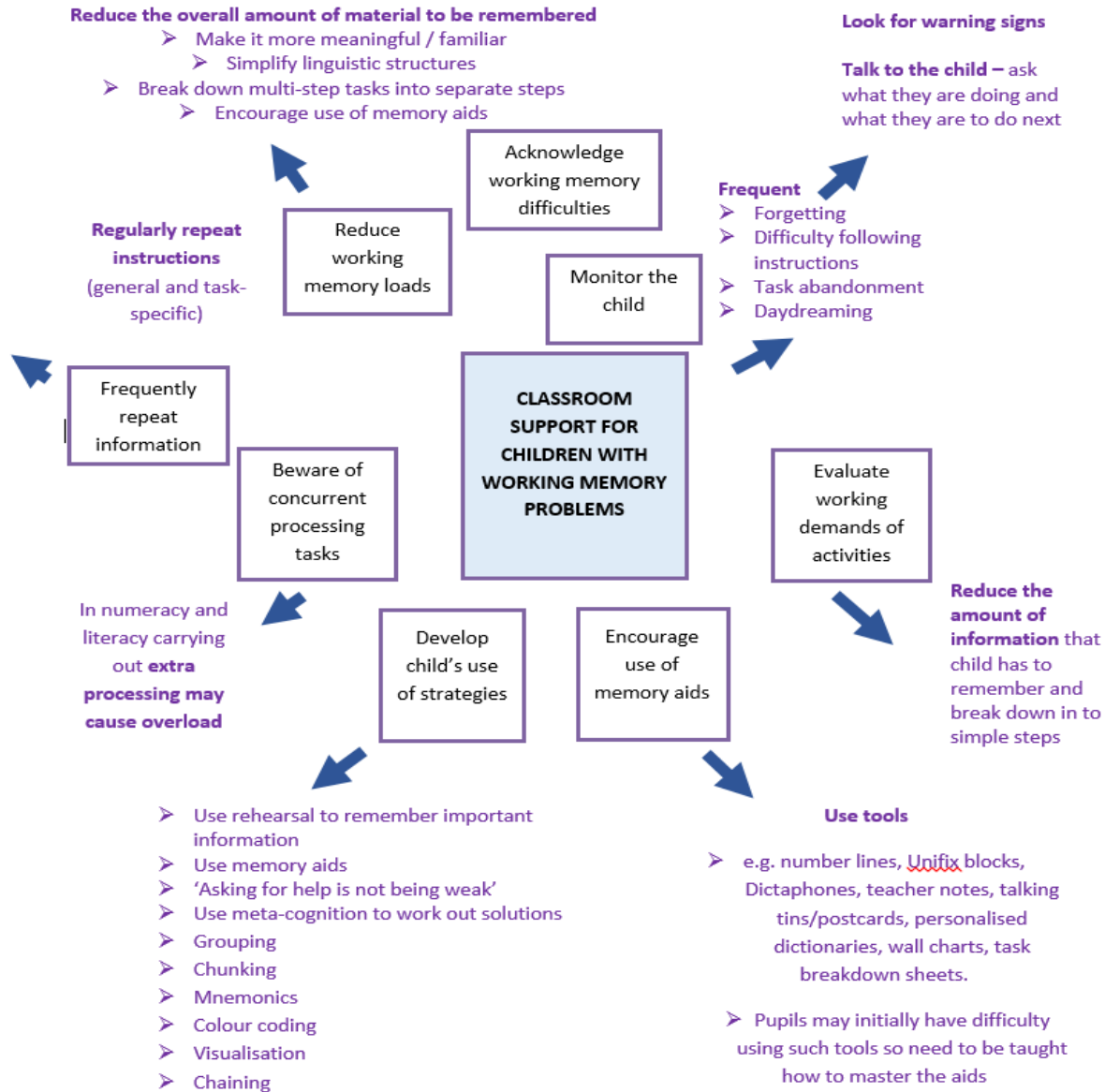
Writing aids – word-banks, keyrings, personalised dictionaries, prompt sheets, post it notes, task breakdown sheets

Mathematical aids - Numicon, number lines, three dimensional objects, personalised fact books

Audio aids - talking tins/postcards/sound buttons
teacher notes

ICT aids - tablets, Powerpoint, smartphones – Software Clicker

What to do in the Classroom



GENERAL

Acknowledge/Reassure

Rehearse

Repeat

Re-present

Reduce

Increase meaningfulness/familiarity

Gradated Approach

1 APDR cycle = 6 weeks

Using teacher assessment, data, cycles of APDR, parent/ child involvement. Refer to SENCO

SENCO discussion with parent when more specialist involvement is required.

SENCO makes a request for EHCP if applicable

Wave 1

High Quality Teaching (1)

Wave 2

Short term intervention
(2) SEN Caseworker –
Teacher led

Wave 3

SEND register (K)
Long term intervention
Involvement of SENCO

Wave 4 EHCP (E)

Student's can move up and down based on the provision they are receiving

- What every child receives
- All staff responsible for ensuring Wave 1 provision is delivered
- Teacher standards
- Reasonable adjustments
- Class teacher has implemented HQT classroom strategies (pupil profile) and followed 2 cycles of. Assess/Plan/Do/Review.
- Student recorded as (1) on EduKey

- Not making expected progress despite reasonable adjustment at wave 1.
- HQT and Short Term specific intervention required. (specialist, class or curriculum)
- Baseline assessments to be completed with recommendations.
- Student recorded as (2) on EduKey

- In-depth assessment to establish area of need.
- Ongoing, specific support to address child's SEND. Evidenced based intervention monitored by SENCO.
- Young person will have individual learning plan, measurable targets, provision outlined.
- Specialist support from outside agency.
- SENCO involved in coordinating provision, assessment, measuring impact and liaising with outside agency.
- Student recorded as SEND support (K) on SIMS

- Support over and above, additional and different.
- Highly personalised and closely monitored specialist provision.
- Specialist support form external services.
- Student recorded as EHCP (E) on EduKey

Graduated Approach for Working Memory

Using teacher assessment, data, cycles of APDR, parent/child involvement. Refer to SENCO

Wave 1 High Quality Teaching (1)

- What every child receives
- All staff responsible for ensuring Wave 1 provision is delivered
- Teacher standards
- Reasonable adjustments
- Class teacher has implemented HQT classroom strategies (pupil profile) and followed 2 cycles of. Assess/Plan/Do/Review.
- Student recorded as (1) on EduKey

Assessment:

Teacher observation:

- Forgetting
- Difficulty following instructions
- Task abandonment
- Daydreaming

Reasonable Adjustments for children with sensory processing differences:

- Use their name to ensure you have their attention.
- Movement breaks / a job to do.
- Numicon, number lines, three dimensional objects, personalised fact books
- word-banks, keyrings, personalised dictionaries, prompt sheets, post it notes, task breakdown sheets
- Pre-teaching
- talking tins/postcards/sound buttons
- teacher notes
- Reduce language to keep it focused. **Focus on what they need to do.**
- Recap with them to ensure they have understood learning task.
- Whole class visual schedule.
- Visual scaffolding
- Schedule regular check-in times
- Use a visual timer to support focused learning
- Seating in class with minimal distraction around them – front near teacher

Example of APDR target:

Tom will have pre-teaching of vocabulary (word bank) for 10 minutes at the start of every week. Measure the independent use of the word mat through the week compared to teacher input / prompting.

Graduated Approach for Working Memory

SENCO discussion with parent when more specialist involvement is required.

Wave 2

Short term intervention
(2) SEN Caseworker –
Teacher led

- Not making expected progress despite reasonable adjustment at wave 1.
- HQT and Short Term specific intervention required. (specialist, class or curriculum)
- Baseline assessments to be completed with recommendations.
- Student recorded as (2) on EduKey

Assessment and observation:

- Pearson working memory rating scale
- Language Links Infant and Junior
- Anxiety mapping / Roots and fruits – Step On tools
- Boxall Profile

Intervention:

- Targeted Maths and English interventions
- Precision teach
- ERT – Extended rehearsal technique
- **Assistive Technology – dictation / Clicker / touch typing**
- Recommendation from Language links
- Emotional Literacy programme (ELSA resources) – build
- Talk Time (SEMH focus) – Big Books of Blobs

Example of APDR target:

Tom will use a task planner for core subjects (maths and English) including three steps on a white board for him to work through independently. Measure (tally) how often Tom can use task breakdown independently.



WORKING MEMORY RATING SCALE – Record Form

The table below provides descriptions of common classroom behaviours. Please identify how typical each behaviour is of this child by circling the appropriate number in one of the four right-hand columns. Only one number should be selected for each behaviour.

	NOT TYPICAL AT ALL	OCCASIONALLY	FAIRLY TYPICAL	VERY TYPICAL
1. To move on to the next step in an activity, needs frequent prompts by teaching staff	0	1	2	3
2. Puts hand up to answer a question but forgets what s/he intended to say when asked	0	1	2	3
3. Frequently asks for help	0	1	2	3
4. Abandons activities before completion	0	1	2	3
5. Does not respond, or is reluctant to answer (e.g. shrugs shoulders or nods head) when asked direct questions	0	1	2	3
6. Mixes up material inappropriately, e.g. incorrectly combines parts from two sentences rather than reading each one accurately	0	1	2	3
7. Frequently stops during lengthy activities or those involving multiple steps	0	1	2	3
8. Needs regular reminders of each step in a written task	0	1	2	3
9. Forgets how to continue an activity that was previously started, despite teacher explanation	0	1	2	3
10. Benefits from continued teacher support during lengthy activities	0	1	2	3
11. Requires support for effective use of memory aids such as useful spellings and number lines	0	1	2	3
12. Loses his or her place in complicated activities	0	1	2	3
13. Incorrectly repeats the same response, e.g. by writing the same word twice in a sentence	0	1	2	3
14. Does not follow classroom instructions accurately, e.g. carries out some but not all steps in an instruction	0	1	2	3
15. Raises hand but gives inappropriate or incorrect answers	0	1	2	3
16. Is making poor progress in literacy and maths	0	1	2	3
17. Unable to explain what s/he should be doing in a particular activity when asked	0	1	2	3
18. Not able to focus during activities	0	1	2	3
19. Requires regular repetition of instructions	0	1	2	3
20. Depends on neighbour to remind them of the current task	0	1	2	3
			Total	

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Appendix A: T scores and percentiles

Total	Ages 5-6		Ages 7-8		Age 9		Ages 10-11	
	T score	Percentile	T score	Percentile	T score	Percentile	T score	Percentile
0	37	3	41	13	41	12	40	10
1	38	9	42	29	42	28	41	22
2	38	13	43	36	43	36	41	27
3	39	16	43	42	43	39	42	32
4	39	19	44	46	44	41	43	36
5	40	21	44	50	45	45	43	38
6	41	24	46	52	46	46	44	40
7	41	26	46	54	46	51	45	45
8	42	28	46	54	47	54	45	47
9	42	31	47	56	48	55	46	48
10	43	33	48	57	48	57	47	49
11	44	34	48	58	49	60	47	51
12	44	35	49	59	50	63	48	53
13	45	38	50	59	50	64	49	54
14	45	40	50	60	51	65	50	54
15	46	41	51	62	52	68	50	56
16	47	43	51	63	52	70	51	58
17	47	44	52	66	53	71	52	57
18	48	47	53	67	54	73	52	59
19	48	49	53	68	55	74	53	62
20	49	50	54	68	55	77	54	69
21	50	52	55	69	56	77	54	75
22	50	54	55	70	57	78	55	76
23	51	57	56	72	57	79	56	77
24	51	60	57	75	58	80	56	77
25	52	64	57	77	59	83	57	78
26	53	66	58	79	59	84	58	78
27	53	67	58	79	60	85	59	79
28	54	68	59	80	61	85	59	81
29	54	70	60	81	61	86	60	82
30	55	71	60	82	62	87	61	83

Appendix A: continued

Total	Ages 5-6		Ages 7-8		Age 9		Ages 10-11	
	T score	Percentile	T score	Percentile	T score	Percentile	T score	Percentile
31	56	71	61	82	63	86	61	84
32	56	72	62	84	63	88	62	84
33	57	74	62	85	64	89	63	84
34	58	76	63	86	65	89	63	85
35	58	77	63	87	66	90	64	87
36	59	78	64	88	66	90	65	88
37	59	79	65	89	67	90	65	89
38	60	80	65	90	68	91	66	89
39	61	82	66	91	68	92	67	91
40	61	83	67	93	69	92	68	92
41	62	86	67	94	70	93	68	95
42	62	89	68	94	70	95	69	97
43	63	90	69	94	71	96	70	98
44	64	90	69	96	72	97	70	98
45	64	92	70	96	72	97	71	98
46	65	92	70	95	73	97	72	98
47	65	93	71	96	74	97	72	98
48	66	93	72	96	75	97	73	99
49	67	94	72	97	75	98	74	99
50	67	94	73	98	76	98	74	99
51	68	95	74	99	77	98	75	99
52	68	96	74	99	77	98	76	99
53	69	96	75	99	78	99	77	99
54	70	96	75	99	79	99	77	99
55	70	96	76	99	79	99	78	99
56	71	96	77	99	80	99	79	99
57	71	97	77	99	80	99	79	99
58	72	97	78	99	80	99	80	99
59	73	98	79	99	80	99	81	99
60	73	99	79	99	80	99	81	99

Graduated Approach for Attention and Listening

SENCO makes a request for EHCP if applicable

Wave 3
SEND register (K)
Long term intervention
Involvement of SENCO

Wave 4
EHCP (E)

- In-depth assessment to establish area of need.
- Ongoing, specific support to address child's SEND. Evidenced based intervention monitored by SENCO.
- Young person will have individual learning plan, measurable targets, provision outlined.
- Specialist support from outside agency.
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Diagnostic Assessment:

- PHaB
- Sandwell
- Conners Assessment for assessing ADHD
- Functional Behaviour Assessment (FBA)
- Referrals: Community Paediatrician
Link Speech and Language Therapist
SEND 0 – 25 Educational Psychologist or Specialist Teacher

Intervention:

- Specific targets set by external professionals which feed directly into the APDR cycle
- Review of targets 6 weeks later by external professionals or SENDCo.

Example of APDR target:

Tom will use Clicker 7, including predict text and word banks, at least three times a week to produce written output of at least five sentences.

Thank you for listening please ask any questions.

It would be great if you could let us know on a scale of 1 – 10 where your knowledge / confidence is on now for meeting the needs of pupils with attention and listening difficulties following the presentation.



Further Reading:

Understanding Working Memory – A Classroom Guide

by Professor Susan E. Gathercole & Dr Tracy P. Alloway

Working Memory and Learning: A Practical Guide for Teachers

by Professor Susan E. Gathercole & Dr Tracy P. Alloway

CALM (Centre of Attention, Learning and Memory)

CALM is located in the Cognition and Brain Sciences Unit in Cambridge which is funded by the Medical Research Council (MRC)

A new research clinic has been opened for children with difficulties in attention, learning, memory, language, reading and maths.

For further information visit <http://calm.mrc-cbu.cam.ac.uk>

Thank you!