Speld QLD NEWS

Speld Qld Psychology Team

Term 4, Wk 10 2022

Contents

New Speld Qld Assessment Locations!

DAYBORO ***BENOWA***

To book in for a psychoeducational assessment at one of our new locations please complete the assessment application form.

Dyscalculia and Learning Multiplication Tables

By Mandy Jak, Education Advisor

Parents often call the Speld Advisory Line to ask how they can help their child with Dyscalculia, to learn their times tables. This article will explore some evidence-based approaches to assist children with developing their understanding and fluency.

There are some children who simply cannot learn their multiplication tables facts by heart, no matter how much effort they put into the task. These children are often dyslexic or dyscalculic. Their memory is simply not capable of memorising the long lists of numbers. Dyscalculia experts consistently emphasize that memorizing multiplication tables is not recommended for dyscalculic learners. A multisensory approach, developing understanding and reasoning with number patterns is recommended.

WHY IS IT IMPORTANT FOR MY CHILD TO KNOW THE TIMES TABLES?

Being able to recall basic facts efficiently is a necessary first step in the development of more advanced skills for computational fluency with larger numbers and algebraic expressions. When children know their times tables, mental arithmetic becomes easier. Practising times tables also helps children to understand number and number relationships, and to see patterns in numbers. These skills will help them to master key concepts and move quickly through more complex maths problems with confidence.

A thorough knowledge of multiplication and division facts will set children up for success at secondary school. Multiplication and division are fundamental for accessing proportional reasoning, fractions and much of algebra. Even topics in geometry (eg. angles in regular polygon) and statistics (eg. pie charts), are often easier if you can divide fluently. Maths is cumulative and fluency at one level leads to understanding (and more fluency) at the next.

As they grow older, knowing the times tables will help them with everyday activities like shopping, budgeting and cooking.

WHY IS MEMORIZATION NOT RECOMMENDED FOR THOSE WITH DYSCALCULIA?

Dyscalculia significantly limits the memory available for number-calculation. Because of the demands on the memory must be reduced so that the memory system is less taxed and can be reserved for "key facts." Memorizing all the multiplication facts puts too much strain on a dyscalculic's memory system. For a dyscalculic learner, memorization of multiplication tables

does not automatically correlate to understanding the concept of multiplication.

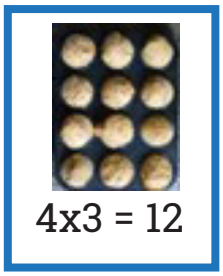
This is not to say that Dyscalculic students can't learn to multiply or that they won't be able to memorize any multiplication facts. But by adapting the teaching methods into ways that are more effective and lead to real understanding, dyscalculic learners can successfully come to understand the process of multiplication - without rote or memorization. To do this, it is especially important to **teach for understanding.**

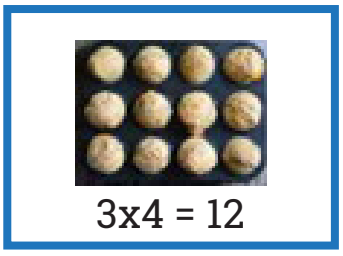
EARLY MULTIPLICATION SKILLS

Children will often confuse multiplication for addition or memorize various multiplication facts without actually understanding what **multiplication** is. When we **multiply**, we are actually **adding equal groups**. For example, the problem 4 "times" 3 means that we are adding a group of 4, three times.

Multiplication has a commutative property which means that no matter what order we multiply the numbers in, the answer is the same. This means that we might think of "4 times 3" as adding a group of 4, three times OR we might think of it as adding a group of 3, four times.

One of the easiest ways for a child to visualize this is with an **array**. A cupcake tray can be used to help children visualize and understand multiplication in a more concrete way. Arrays exist everywhere in real life.



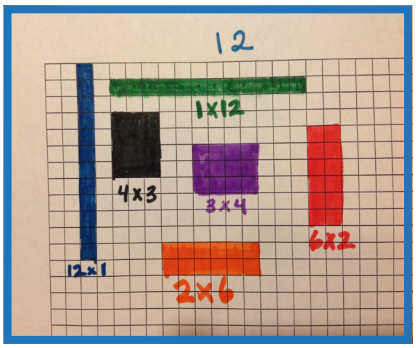


They are a fantastic starting point for noticing and describing multiplication (and therefore division) facts.

Arrays can also prompt some much higher-level challenge questions such as: 'If we know the area of one of these ceiling tiles, how could we use this to calculate the area of the whole ceiling and do we need to count every single tile?'

SEE THE MATHS

To develop number sense and times table proficiency, children need to be able to 'see' the maths in different representations and have the language to describe their own thinking. Mental image activities which encourage this include children closing



their eyes and mentally moving groups of objects or small arrays of dots. Number lines and grids can be imagined and movements and patterns on them described. The use of language is important if we

are to reach shared understandings so we need to make sure that children know the right vocabulary to use when talking about multiplication.

SKIP COUNTING OR REPEATED ADDITION

Skip counting and using the constant feature on the calculator relate to this aspect of multiplication. A calculator can be set to repeatedly add equal quantities by using the inbuilt constant feature eg count by 4 using: + 4 = = =

RATES

Rates problems arise in real world situations, for example when buying fruit and vegetables (3kg of apples at $2 per kg)

EFFECTIVE METHODS IN WHICH DYSCALCULIC STUDENTS CAN LEARN MULTIPLICATION SUCCESSFULLY.

The most important recommendation I have found is to: **Teach multiplication facts using the grid format rather than a collection of tables.** The reasons for this have been explained below. Note that the 11 and 12 times tables are not considered basic multiplication facts – the 11x tables can be discussed at a later time, when looking at patterns. The 12x tables were more relevant when imperial measurement was used and can be easily derived from the 11 x tables facts if necessary.

GRID FORMAT

• Helps students see the relationships and patterns between basic multiplication facts

• Helps to link multiplication and division

Multiplication

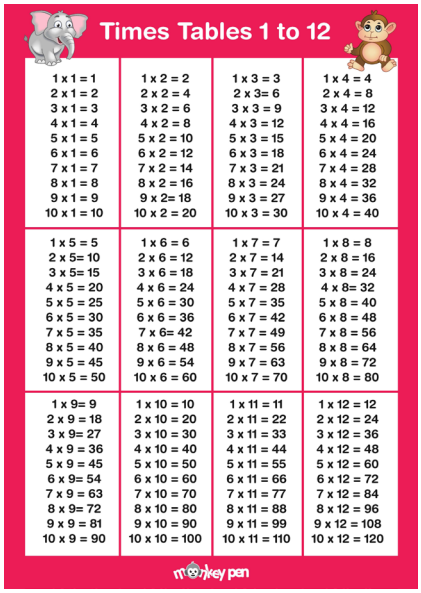
X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

• Illustrates the communitative property of multiplication

COLLECTION OF TABLES

• Hides commutative property of multiplication

• Students often have to recite through all tables to arrive at the result they need



An understanding of the **properties** of multiplication will help students to learn the basic multiplication facts. An example of how some of the properties can be used to reduce the number of facts that need to be "learned" is illustrated below.

Multiplication by zero- **any number multiplied by zero is zero**

The Multiplication Property of One – **Any number multiplied by one is itself.**

The Commutative Property of Multiplication – **numbers may be multiplied in any order without changing the result.**

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

1. Multiplication Property of Zero

2. Multiplication Property of One

3. Commutative Property of Multiplication

Teach students what multiplication tables mean and how they are created. This work leads to teaching specific strategies that allow the pupils to derive all the tables facts from a few key facts. Start with concrete materials, namely Cuisenaire rods, and have the pupils work through carefully targeted activities until they can use visualisation, logic and reasoning to find answers to multiplication and division tables questions.

"The best way to learn times tables facts is to use a multi-sensory approach which makes the relationships between the facts explicit as well as providing plenty of opportunity for revision of facts. Teach pupils to understand the concept of multiplication by reasoning. They use step counting skills and their knowledge of number patterns to see multiplication as the structured repetition of a quantity" - Jane Emerson and Patricia Babtie, The Dyscalculia Solution, p. 148

The learning process begins with the student's solid understanding of several previously learned concepts: Doubling, Halving, Step Counting, Components, Bridging, Partitioning, Place Value, and Multiply/Divide by 10. These pre-skills will help the student understand multiplication with more success.

Dyscalculia experts recommend students start with learning the 2x, 5x, and 10x tables. This enables the student to fully understand and retain only a few key facts. When the strain on the memory is lessened, students can recall them with greater reliability. Students are then guided in how to use

these three key multiples, along with reason and logic, to derive the rest of the multiplication facts.

This method enables the student to connect and build from the skills they have previously learned. For example, the 2x table can be experienced as "doubling" a number – an important pre-skill. The 5x table can be experienced as "halving" the 10x table –another important pre-skill for dyscalculics to learn prior to multiplication.

DOUBLING AND HALVING ARE KEY SKILLS

The 2x, 4x and 8x tables can be generated by repeated doubling. The 10x table is easy to memorise and gives the 5x table by halving. The 6x table is double the 3x table. The 9x table can be related to the 10s by subtracting from 10, such as 7x9 = 7x10 – 7. Strategies using fingers and the sum of the digits of multiples of 9 will also help in learning the multiples of 9. This leaves the 7x table but most of the multiples of 7 will have already been encountered in the other tables.

RELATE TO A KNOWN FACT

A powerful strategy. To make this strategy effective the student must have learned some basic facts. Students use their bank of knowledge of known facts to work out or derive new facts. e.g. if 6 x 8 is unknown, they can use 5 x 8 as the base to think: "I know that five eights are 40 and another 8 makes 48"

The more facts a student knows the larger the selection that may be used as the basis to derive new facts.

Combining the properties of multiplication and various mental strategies will help students to learn the multiplication facts. However, the aim is for students to become fluent in using the basic multiplication facts.

When memory fails, our pupils need an alternative. An over-dependence on teaching early maths with rote dominating denies them the chances to conceptualise and progress.

DEVELOPING FLUENCY

Fluency of multiplication facts is different to recall "instantly, with speed" – studies show that the pressure to respond quickly inhibits rather than assists students to recall facts, putting them under stress rather than looking for relationships and connections in number, they use the first method that springs to mind no matter how inefficient. Pressure of timed tests puts students under stress and clouds their ability to think.

MORE APPROACHES TO LEARNING BASIC MULTIPLICATION FACTS

The following approaches are based on the students having an understanding of the properties of multiplication and basic strategies.

Cluster Approach learning clusters of facts rather than in order (the 2x, 3x 4x etc).

This can be 2x 4x 8x. If you can double that means

you can work out 2x table. If you can double and double again you can work out 4x table. If you can double and double and double again you can work out your 8x table. A similar logic can be used to work out the 6x tables by doubling the 3x tables.

Clustering up to 5x5 and beyond - this approach involves learning the 2x 4x 5x and 3x tables only as far as 5x5. The facts are copied onto a grid. The commutative property, skip-counting and use of patterns completes the rest of the tables.

ALTERNATIVE APPROACHES

After developing an understanding of the property of multiplying by 0 and 1, students should learn square numbers and use these as a basis for deriving other basic multiplication facts.

Create individual table map for each student - to see which x tables and properties are known/unknown so students with similar needs can be grouped together and specific areas can be targeted.

Fact Families – learning the related multiplication and division facts at the same time – eg 4x5=20, 5x4=20, 20÷5=4 and 20÷4=5

AN APPROACH FOR OLDER STUDENTS

Discuss multiplication property of zero and colour in all the zero times tables

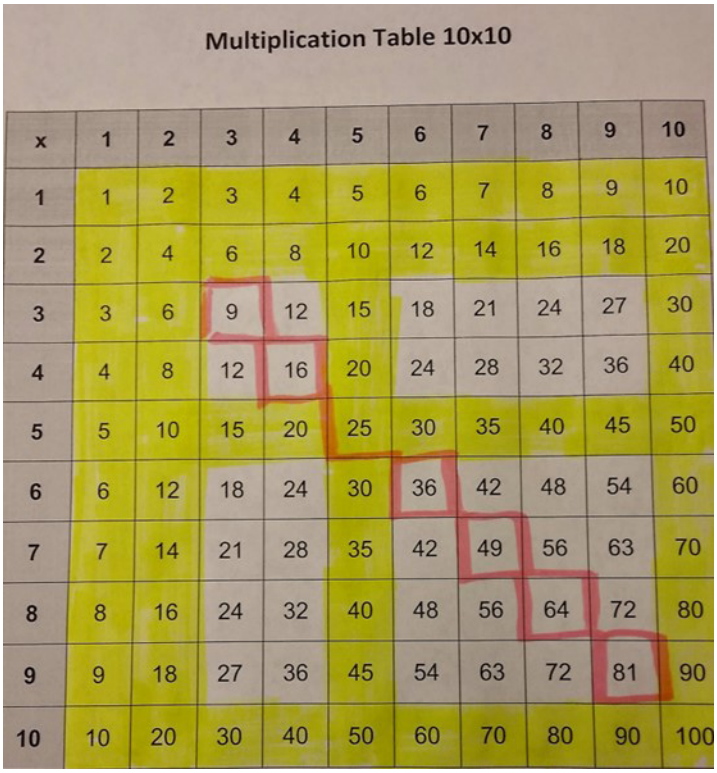
Discuss multiplication property of one and colour all the one x table

If they can count by 2 to 20, they can colour the 2x table

Count in 5's and discuss the 5, 0, 5, 0 pattern that is formed. Colour in 5x table

Discuss x by 10 and describe pattern they can see. Colour in 10x table

Focus on commutative property. IF they understand the commutative property, then they have far less facts to remember



Multiplication Table 10x10

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

The grid above shows the remaining facts to learn – squares outlined in orange are square numbers and the 15 white squares are the other facts to learn.

MULTIPLICATION MASTERY

Multiplication has a real-life purpose, so it's important to look for opportunities to use it when problem-solving - e.g. when shopping or using recipes.

For many maths experiences to be effective, children need to be able to work with and manipulate practical materials. For multiplication mastery, children should

encounter the same concepts in many different contexts to help them identify and describe common patterns and relationships.

Ronit Bird explains:

> **"I play tables games with my pupils - not in the hope that they will gradually learn to memorise the facts. They will not. Instead, I use the games as an enjoyable way of practising the reasoning techniques that I have previously taught them and that they fully understand but have not yet fluently mastered. The important point is that you must provide the children with good strategies for finding the solutions, before playing these games. I hope you use my games ... in place of the endless and boring worksheets that children are so often asked to race to complete."**

When exploring multiplication and division facts in classrooms, teachers should include a balanced range of experiences that ensure children consolidate and extend their learning. Where possible they should be integrated into every lesson too. According to Nick Tiley-Nunn in his book, 'How To Teach Primary Maths', when teaching times tables then it's a good idea to SMASH them to pieces. By this he means:

Short and sweet – spend approximately 5 minutes on a times table related activity every day.

Mix it up – ensure that children can recall their multiplication facts forwards, backwards and jumbled up so they can work out related division calculations.

Arrangement – represent numbers in as many ways as possible (e.g. arrays, patterns etc)

Stir and stimulate – encourage variety, movement and competition through times tables circuit training (make several stations where pupils use times tables to solve questions. Each station should require physical activity)

Hammer away – consistent practise and plenty of repetition to develop resilience and perseverance.

It's worth remembering, times tables is a 'long game' and children need to go through several learning stages over many years before they can understand them.

Learning the multiplication facts are essential as they make a very large contribution to numeracy and underpin our maths system like counting, number bonds and place value. If children can get a firm grasp of their times tables, then they have a solid arithmetical foundation for future problem-solving.

RECOMMENDED RESOURCES

Understanding Times Tables by Ronit Bird

Multiplication and Division Milestones by Dr Paul Swan

Tackling Tables by Dr Paul Swan

Dice Games for Tables by Dr Paul Swan

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Executive Functioning

WHAT IS EXECUTIVE FUNCTIONING?

Executive functioning is a process of higher brain functioning that is involved in goal directed activities. It is the part of the brain that enables people to make decisions and direct attention to a range areas in order to be successful in in a more wholsitic goal. It is similar to an executive of a company who plans out how the resources of the company will be used, decides what the priorities are, decides what direction things will take in the long term and decides what to do when there is conflicting information. This is a process of

understanding the concept that all actions cause a response or have a consequence. For most people executive functioning occurs without conscious thought and we improve as we mature. For some, however, they require explicit guiding to develop appropriate strategies to overcome their lack of innate functioning. Executive functioning deficits are not a diagnosis in themselves, but they make any other diagnosis that much more difficult to address.

WHY IS EXECUTIVE FUNCTIONING IMPORTANT?

The skills involved in executive functioning allow us to do the following:

Initiate: Beginning a task or activity.

Impact of difficulty: May have trouble getting started on homework or independent tasks.

Inhibit: Not acting on an impulse or stopping one's own inappropriate activity at the proper time.

Impact of difficulty: May have trouble stopping negative behavior or acts without thinking.

Shift: The ability to move from one situation, activity, or aspect of a problem to another as the situation demands.

Impact of difficulty: Can get stuck on a topic or tends to perseverate on ideas or actions.

Plan: Anticipating future events, setting goals, and developing appropriate steps ahead of time to carry out an activity.

Impact of difficulty: May start assignments at the last minute; does not think ahead about possible problems.

Organise: Establishing or maintaining order in an activity or place; carrying out a task in a systematic

manner.

Impact of difficulty: Often has a scattered or disorganised approach to solving a problem; is easily overwhelmed by large tasks or assignments and unsure where to begin.

Self-monitor: Checking on one's own actions during, or shortly after finishing, the task or activity to ensure appropriate attainment of goal.

Impact of difficulty: Unlikely to check work for mistakes; is unaware of own behavior and its impact on others.

Working memory: Holding information in the mind for the purpose of completing a specific and related task.

Impact of difficulty: Trouble remembering things, even for a few minutes; when sent to get something, forgets what he or she is supposed to get.

Emotional control: Modulating/controlling one's own emotional response appropriate to the situation or stressor.

Impact of difficulty: Is easily upset, explosive; small events trigger a big emotional response.

WHAT ARE THE BUILDING BLOCKS NECESSARY TO DEVELOP EXECUTIVE FUNCTIONING INCLUDE:

Executive functioning is in fact the underlying skill for many other areas of development and as such there are no other building blocks relevant. There are, however, important key concepts that help develop executive functioning skills that all parents and carers should be aware of.

HOW CAN YOU TELL IF MY CHILD HAS PROBLEMS WITH EXECUTIVE FUNCTIONING

If a child has executive functioning difficulties they might:

→ Have difficulty with goal setting

→ Show little awareness of the process involved in how things happen.

→ Have difficulty getting started on a task.

→ Live in the current moment and not think for the future or about consequences.

→ Be unable to reflect on past experiences to plan for the future, resulting in discipline measures producing little change.

→ Use the same strategy to solve a repeated problem, even if proven ineffective.

→ Change from impulsive to rigid rapidly, often when there is an increase in anxiety.

→ Have difficulty adapting to change.

→ Rarely match a strategy to a problem.

→ Have low self esteem and is unrealistic about their abilities.

→ Have difficulty overriding an emotion in order to behave appropriately.

→ Locate the source of their troubles outside their control.

→ Have a low tolerance for failure.

→ Skip steps in a procedure and is baffled when the outcome is not reached.

→ Have difficulty putting a sequence of steps in

order or realising there are sub goals in a task.

→ Have difficulty shifting perspectives.

→ Need prompting to consider the feelings of others.

→ Fail to see the 'big picture' of a task or situation.

WHAT OTHER PROBLEMS CAN OCCUR WHEN A CHILD HAS EXECUTIVE FUNCTIONING DIFFICULTIES?

When a child has executive functioning difficulties, they might also have difficulties with:

Behaviour: The child's actions, usually in relation to their environment or task demands.

Self regulation: The ability to obtain, maintain and change one's emotion, behaviour, attention and activity level appropriate for a task or situation in a socially acceptable manner.

Social skills: Determined by the ability to engage in reciprocal interaction with others (either verbally or non-verbally), to compromise with others, and be able to recognize and follow social norms.

Academic performance: The ease with which a student is able to complete academic tasks.

Attention and concentration: Sustained effort, doing activities without distraction and being able to hold that effort long enough to get the task done.

WHAT CAN BE DONE TO IMPROVE EXECUTIVE FUNCTIONING?

Rationale: When a child learns new skills, provide the rationale behind them or things like planning for the task might feel like a waste of time.

Outline steps: Support the child by defining the steps involved in tasks ahead of time to make a task less daunting and more achievable.

Use aids: Use tools like time organisers, computers, ipads, or watches with alarms.

Visuals: Prepare visual schedules and review them several times a day.

Provide 2 types of information: Provide the child with written (or visual) instructions as well as oral instructions.

Create checklists and "to do" lists, estimating how long tasks will take. Use checklists for getting through assignments. For example, a student's checklist could include items such as: get out pencil and paper; put name on paper; put due date on paper; read directions.

Use calendars to keep track of long-term assignments, due dates, chores, and activities.

Improve working environment: Assist the child to organise their work space and minimise clutter.

Teacher meetings: Meet with a teacher or supervisor on a regular basis to review work and troubleshoot problems.

Establish routines to try to consolidate skills and memory of what needs to be done.

WHAT ACTIVITIES CAN HELP IM-

PROVE EXECUTIVE FUNCTIONING?

Cut and paste projects requiring multiple steps in which they must complete tasks in a sequential manner.

Mind mapping to assist the child to get ideas down on paper strategically.

Games: Planning and problem solving games such as puzzles or games like 'Go Getter' (River & Road game).

Lotus diagrams: Use lotus diagrams with the child to help with structuring thoughts on paper whilst creating clear expectations as to how much to write.

Block building: Get the child to copy block designs from a picture or a 3D model.

Drawing: Draw a picture as a model. Then draw an incomplete version of the same picture and ask the child to finish the picture to make it look like the model.

Practice goal setting with the child (e.g. Help the child to set attainable goals that are well-defined). Break goals down into smaller steps and talk about alternative approaches with the child.

Recall games that require the child to recall information such as Memory: "I went to the shops and bought a…".

Multi-tasking: Practice doing a number of activities at once (it may be helpful to number the activities) to encourage the child to learn to shift from one activity to another.

WHY SHOULD I SEEK THERAPY IF I NOTICE DIFFICULTIES WITH EXECUTIVE FUNCTIONING?

Therapeutic intervention to help a child with executive functioning is important to:

→ Reduce behavioural problems due to stress and anxiety.

→ Allow children to develop the foundation skills that allow academic success to come more easily.

→ Make daily life easier for the entire family as everyday activities can become difficult (if not impossible) when a child can not copy with change, resulting in negative affects on all family members.

→ The earlier difficulties with executive functioning are address the easier it is to make change.

→ Executive functioning is a learnt skill in which some need more modelling and assistance than others. Only with the right guidance will they develop these skills.

IF LEFT UNTREATED WHAT CAN DIFFICULTIES WITH EXECUTIVE FUNCTIONING LEAD TO?

When children have difficulties with executive functioning, they might also have difficulties with:

→ Making friends and poor self-esteem.

→ Inability to cope with the demands of school or life.

→ Poor work and organisational habits.

→ Frequently loosing track of personal items.

→ Poor academic results.

→ Not completing school work or daily chores in a timely manner.

→ Having grandiose ideas of what they wish to achieve but not being able to achieve it pragmatically.

WHAT TYPE OF THERAPY IS RECOMMENDED FOR EXECUTIVE FUNCTIONING DIFFICULTIES?

If your child has difficulties with executive functioning, it is recommended they consult an Occupational Therapist.

This article has been sourced from Kid Sense Child Development.

New Speld Qld Professional Development!

The Challenge of Learning to Read

• The changes that have been made to the Australian Curriculum (Version 9) mean schools need to consider how they are teaching students to read.

• We have designed a one-hour workshop to assist educators to understand the research and theory behind learning to read and spell and how they can implement best practice in their classrooms in light of the recent curriculum changes.

Find Out More

Benefits of Speld Qld Family Membership

- Access to educational experts through the free advisory line - 3391 7900
- Discounted rates for workshops and shop items
- Borrow from the Speld Qld library
- Access to the Specailist Teacher database
- Access to paid services such as the assessment service and Specailist Teacher database
- Online member resources area
- Speld Qld magazine twice per term

Become a Speld Qld family member here!

The Language, Literacy and Learning conference - Stanislas Dehane

I've just been to a fantastic conference in Perth, organised by the Dyslexia SPELD Foundation of WA. I missed the first one in 2017 because of a diary facepalm, and have been kicking myself and looking forward to this conference ever since.

I took my laptop, imagining I'd find time each evening to write a riveting blog post about the day's new learning. Instead I kept going out for drinks with colleagues, sorry not sorry, but a room full of like-minded colleagues is an irresistible thing of beauty and a joy forever.

Then I was going to write a blog post on the plane, but found myself chatting to the nice and distractingly handsome young bloke sitting next to me, sorry not sorry again. Since then I've realised that any blog post that did justice to the whole conference would need to be about a kilometre long. So I've decided to just write a few posts about the best bits.

LEARNING IS A PROCESS OF NEURONAL RECYCLING

French cognitive neuropsychologist Professor Stanislas Dehaene gave the opening keynote address of the conference. He firstly told us we should forget everything we've heard about the differences between the left and right brain.

Young children's brains are astonishingly flexible and able to reorganise. There are twice as many synapses in a child aged one or two as in an adult. Synapses come and go all the time.

A child whose entire left hemisphere was surgically removed in infancy was still able to learn language and literacy more or less along the usual lines.

LEARNING TO READ = ESTABLISHING A VISUAL INTERFACE INTO THE LANGUAGE SYSTEM

When we learn to read, we establish a new visual interface into the language system. It develops in an area of the brain otherwise used to recognise faces and objects, but the cells (called voxels) in it are weakly specialised. When you teach children to read, you specialise voxels for words.

In the process of learning to read, the task of recognising faces and objects is partially displaced to the right hemisphere. The lack of this displacement is therefore also a marker of dyslexia.

This makes room for the creation of the Visual Word Form Area (VWFA), and the development of a whole new circuit for processing language visually. Learning to read increases the physical

connections (myelination) between vision and language in the brain.

The VWFA develops in the same area in the brain, regardless of which language you speak.

Learning music or maths also reorganises your brain. Competition for neurons means that learning music shifts your VWFA slightly. Brain scans of mathematics professors looking at numbers and formulas appear different from scans of the brains of humanities professors on equal salaries looking at the same numbers and formulas.

The process of learning to read then changes the spoken language system.

IT'S MUCH HARDER TO LEARN TO READ AS AN ADULT

The brain area that children typically re-purpose for reading has already been specialised for recognising faces and objects by the non-literate adult brain.

This makes it much harder to learn to read as an adult. We see this in the slow progress of most adult learners. It's a bit too late for their brains to re-specialise.

It's also harder to relearn reading if this skill is lost. A colleague of Dehaene's had a small, specific stroke to the reading area of the brain and lost the ability to read. He was eventually able to relearn in a painstaking, letter-by-letter way, but not able to read fluently.

While neuroplasticity declines gradually over time, puberty is an important moment for the loss of brain plasticity.

STUDYING LES ENFANTS' LEARNING

France has a national phonics check to make sure children can read 50 simple words by the end of grade 1. This is not controversial.

To study brain area activation in children in Dehaene's lab, they ask children to pretend to be astronauts going on an adventure in a rocket, and this helps them find going into a scanner to have their brains scanned fun, not scary.

Learning to read is at first very effortful. In their first year of learning to read, children's brains light up a lot on scans during reading.

In the second year, skills are more automatised so there is lower activation.

LETTER REVERSALS

Our brains have a mirror invariance system that allows us to recognise objects as the same, even though they look different from different angles.

We have to override this system when we learn to read, so we can perceive letters like p, q, b and d as different. This is difficult and takes time, which is why children often reverse letters.

Learning the different gestures involved in writing each letter allows us to surmount this problem.

THE DIFFERENCE BETWEEN NOVICE AND EXPERT READERS

Children need strong oral language in order to learn to read, including strong phonology (speech sounds) and a strong lexicon (vocabulary).

When they start school, teaching needs to focus first on phoneme-grapheme (sound-spelling) mappings, as this is the main route into reading.

These must be explicitly taught, as the concepts involved are very abstract. Children must relate the space of the written word to the time of the spoken word.

At first, graphemes must be consciously processed in a series/one by one.

As the learner's skills and experience grow, the letters of a word start to be unconsciously processed in parallel/all at the same time.

This frees up the learner's attentional resources to focus on the meaning of what is being read.

Dehaene says, "Reading is never global or whole word, especially not in children".

Beginning readers engage in slow, serial decomposition of words, and skilled readers engage in fast, parallel decomposition of words.

This means it's time to stop asking children to memorise lists of high-frequency words. Research has shown that whole word memorisation doesn't help to create the brain's reading circuit.

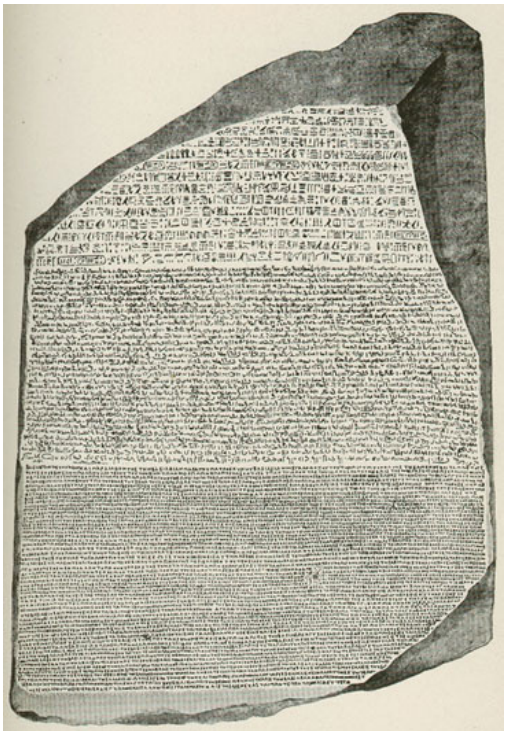
ATTENTIONAL FOCUS AFFECTS LEARNING

A group of researchers (Yoncheva et al) taught two groups of adults to read an artificial script.

One group was taught to pay attention to the words as wholes (taught in a Whole Word way).

The other group was taught to pay attention to the graphemes and phonemes (sounds and letters) in the words (taught in a phonics way).

Only the group taught using the phonics approach



were then found to have left brain activation when reading the script. The whole word group had right brain activation.

The group taught using a phonics approach were able to generalise what they had learnt to allow them to read new words written in the same script. The group taught to pay attention to whole words couldn't do this.

Think about this. Intelligent adults did not deduce the alphabet from words, yet that's what young

children are often expected to do. Directing attention correctly sends information to the correct brain circuits.

THE ROSETTA STONE AND READING COMPREHENSION

Whenever you train phonics you improve comprehension, because reading is a cipher.

Think of the Rosetta Stone. If you can't decode it, you can't understand it.

Developing adult-level language comprehension is a long-term process, involving vocabulary enrichment, understanding of complex referents and so on.

Once you can read, this changes your spoken language system. It gives you access to more and different language.

THE IMPORTANCE OF WRITING FOR READING

Our brains have a circuit which specialises for recognising writing gestures. There is a lot of evidence that reading improves when learning to write.

The research is very clear that reading and writing should be taught together. You can learn to type later on.

Daily practice and sleep are also very important for learning.

WANT TO FIND OUT MORE?

Reading in the Brain by Stanislas Dehaene is published by Penguin Random House. Highly recommended. I have a dog-eared copy, but in a weird, groupie way bought an extra copy I will probably never read for him to sign at the conference.

He also wrote a book called "Apprendre à lire: Des sciences cognitives à la salle de classe", which my rusty high school French translates as "Learning to read: from cognitive science to the classroom". I'm looking forward to the (apparently imminent) English translation.

In 2015 I wrote a couple of blog posts about Prof Dehaene's work, one of which includes a link to a video of him giving a talk. They are here and here.

This blog post was written by Alison Clarke and has been sourced from Spelfabet.

Decodable Books

By Jackie Court, Speld Qld Librarian

WHY USE DECODABLE BOOKS?

"Evidence suggests that phonics teaching is more effective when children are given immediate opportunities to apply what they have learned to the reading" (Hatcher, Hulme, and Ellis 1994).

It is a recommended teaching strategy to use decodable readers to provide opportunities for students to apply the knowledge and skills they have acquired. Decodable texts are also beneficial because they contain only the phoneme-grapheme relationships and high frequency words the student has been explicitly taught.

"Texts need to be carefully matched to the phonics being learned at the time, but only after a student has developed automaticity with the graphemes contained in the book" (Seamer, 2021).

"Decodable books need to be read in order and in stages. It is also recommended to read the books at least three times in order to develop the student's confidence, skills and fluency" (LLLL, 2020).

It is important to note decodable texts are not the only types of texts which support student's oral language, fluency and comprehension - children still need to enjoy a variety of quality children's literature even if they are above their reading level. Children can still enjoy the picture books, graphic novels and non-fiction books from the school library. Continue to read to children for as long as possible and discuss what has been read, in order to foster a love of reading and literature.

WHAT ARE DECODABLE BOOKS?

Decodable books are books that children can read as they learn the alphabetic code in the early stages of reading instruction. They provide opportunities for the readers to practise and consolidate the skills they have been explicitly taught, to achieve reading proficiency, confidence and enjoyment of reading.

"Decodable books promote automaticity and fluency, both of which are important precursors to reading comprehension (the widely agreed ultimate purpose of reading)" (Snow, 2022).

"Decodable texts are simple texts that contain limited graphemes and irregular high frequency words, so that students are only asked to read material that they can sound out. There is no guessing, no looking at pictures and no "thinking about what makes sense" to lift the words from the page when reading decodable texts" (Seamer, 2021).

FEATURES OF DECODABLE BOOKS

- Phonically controlled texts
- Designed for practising the skill of decoding
- Steady progression of phonemes, building on previous knowledge
- Real books with characters, plot, fluent language and story structure
- Promote vocabulary development (LLLL, 2020)

1 They are phonically controlled. The texts contain the phoneme (sounds) to grapheme (letters) correspondences that the reader has already been explicitly taught.

2 Decodable books are designed to practice the skill of decoding, so the reader can decode and read most of the words independently (no need to rely on guessing). They provide the opportunity to practice and apply.

3 The books are a steady progression of phoneme-grapheme correspondences, building on previous knowledge. They increase in length and complexity thus providing lots of practice of the new sounds and letters – thus giving the reader multiple opportunities to reach mastery and to gain confidence in their abilities.

4 Decodable books contain real stories with characters, plot, text features and story structure the readers are motivated to read. Accurate decoding of the stories provides opportunities for the readers to practice fluency and comprehension of the story plot, characters and its language features. Decodable texts often have sequential stories and the readers can follow familiar characters on new adventures.

5 Decodable readers teach vocabulary. They are carefully designed, so their text and content is suited to the students reading development. The length of the stories, vocabulary and story structure become more complex as students move through the sequential reading program.

"We can't just throw children in the deep end

with books containing the whole alphabetic code and complex sentences and think that they'll "pick it up". We need to carefully scaffold experiences through decodable texts to allow children to experience success at each phase of the reading acquisition process. Quality decodables contain dialogue, a range of sentence structures, rich vocabulary and engaging story lines" (Seamer, 2021).

"A child who is phonemically aware is able to isolate sounds, manipulate the sounds, blend and segment the sounds into spoken and written words" (Heggarty, 2020).

SPELD QLD LIBRARY

Speld Qld has numerous sets of decodable readers, both fiction and non-fiction, available to borrow and purchase. We have sets from:

- Phonics Australia
- Little Learners Love Literacy
- Decodable Readers Australia
- MultiLit

The library catalogue can be found on our Speld Qld webpage.

All borrowers must be current Members of Speld Qld - membership is an annual fee of $77.

You can view and borrow from the Library during office hours, Monday to Friday, 8.00am-4.00pm. Alternatively, search the library catalogue and request a hold on an item. To borrow or reserve an item from the Library please email library@speld.org.au or phone 3391 7900.

You can borrow up to six resources for six weeks duration, however only a maximum of two phonic book reading sets at a time.

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Upcoming Workshops Term 1 2023

21 Feb

Sounds Write Face-to-Face (Far North Queensland)
Presented by Kylie Power
Time: 9:00am - 3:30pm Tues - Fri

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Supporting people experiencing learning differences