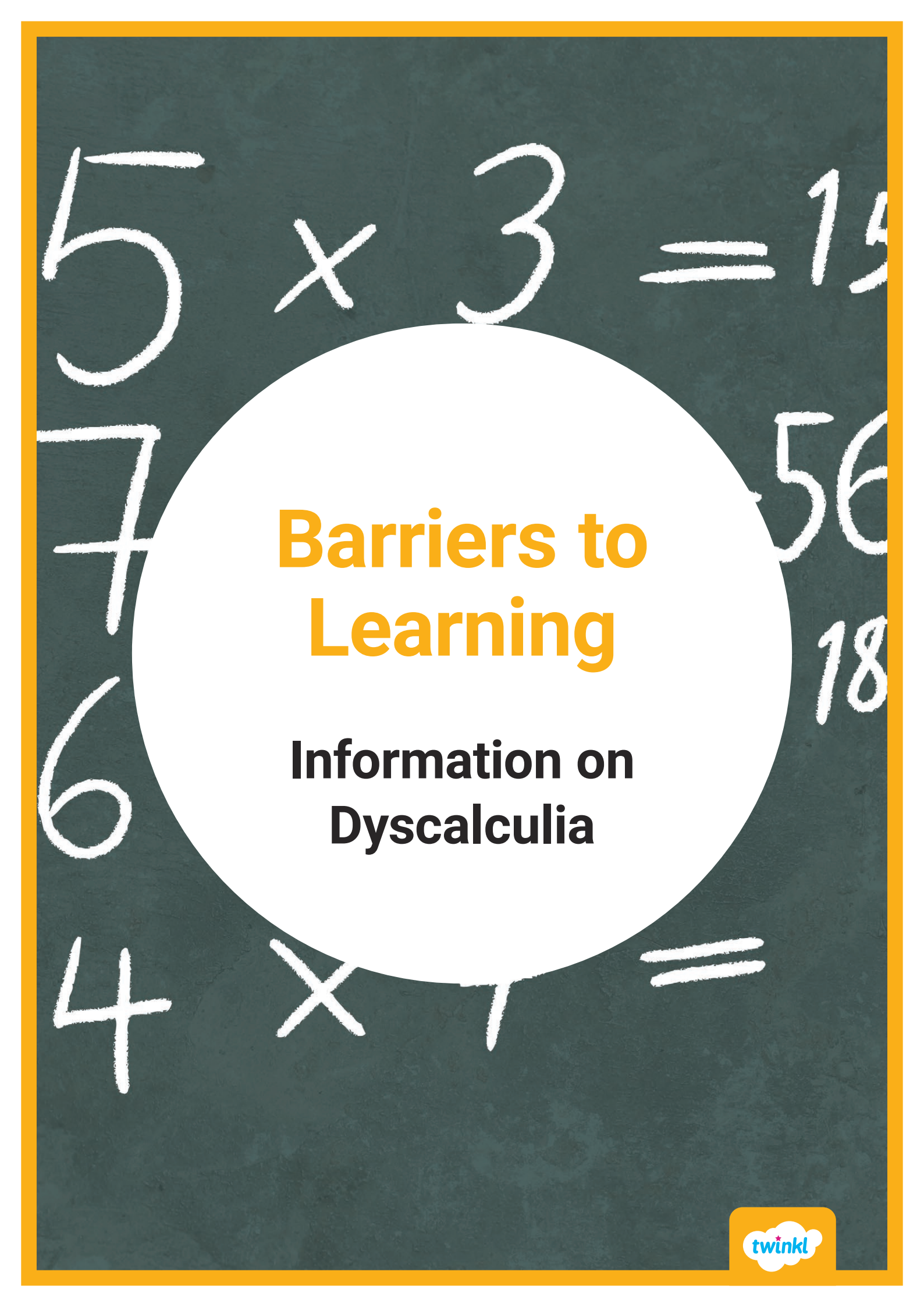


The background is a dark green chalkboard with white chalk markings. At the top, the equation '5 x 3 = 15' is written. To the right, '56' and '18' are visible. At the bottom, '4 x 1 =' is partially visible. A large white circle is centered on the page, containing the title and subtitle.

Barriers to Learning

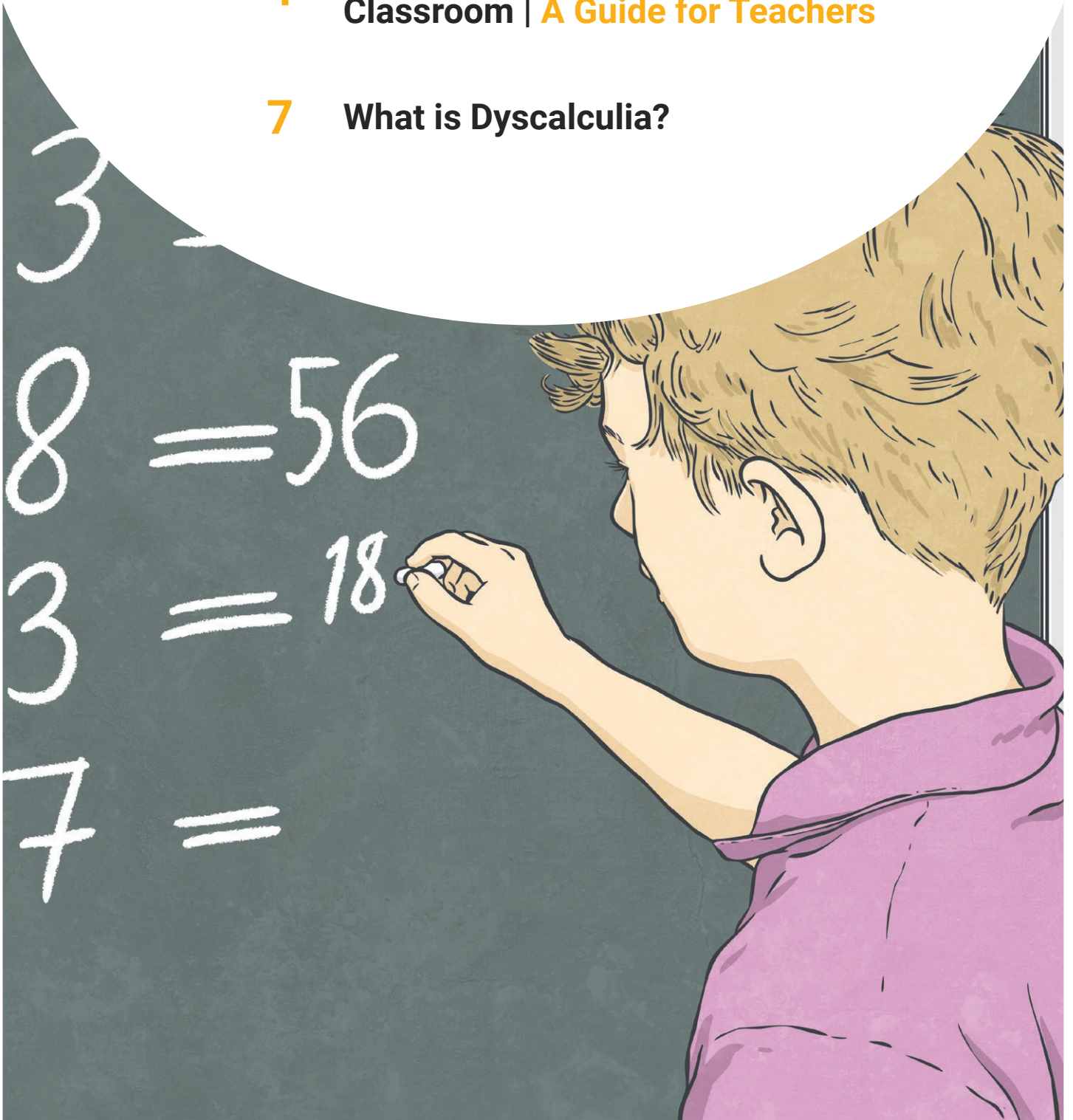
**Information on
Dyscalculia**

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Creating a Dyscalculia-Friendly Classroom

A Guide for Teacher

What is Dyscalculia?

The Department for Education defines dyscalculia as '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.'

Dyscalculia is similar to dyslexia but it involves numbers rather than words and letters. Very little is known about the prevalence, causes or treatment of dyscalculia, however. Current thinking suggests that it is a congenital condition, caused by the abnormal functioning of a specific area of the brain. People with dyscalculia can experience difficulty with many aspects of numbers and arithmetic.

Estimates indicate that somewhere between 5% and 10% of South Africans are affected. These statistics refer to children who are 'purely' dyscalculic – this means that they only have difficulties with maths and have good or excellent attainment in other areas of learning.

Does Dyscalculia Also Affect People with Dyslexia?

- Research suggests that 40-50% of dyslexic people show no signs of dyscalculia. They perform at least as well in maths as other children, with about 10% achieving at a higher level.
- The remaining 50-60% of dyslexic people do also have difficulties with maths. Not surprisingly, difficulty in decoding written words can transfer into a difficulty in decoding mathematical notation and symbols.
- For some dyslexic pupils, however, difficulty with maths may in fact stem from problems with the language surrounding mathematical questions rather than with number concepts – their dyslexia may mean that they misunderstand the wording of a question.
- In summary, dyscalculia and dyslexia can occur both independently of each other and together. Strategies for dealing with dyscalculia will be fundamentally the same whether or not the learner is also dyslexic.

Does Dyscalculia Also Affect People with Dyslexia?

- Counting: Dyscalculic children are usually able to learn the sequence of counting words, but may have difficulty navigating back and forth, especially in twos and threes.
- Calculations: Dyscalculic children usually find learning and recalling number facts difficult. They often lack confidence even when they produce the correct answer. They may also fail to use rules and procedures to build on known facts. For example, they may know that $5+3=8$, but not realise that, therefore, $3+5=8$ or that $5+4=9$.
- Numbers with zeros: Dyscalculic children may find it difficult to grasp that the words ten, hundred and thousand have the same relationship to each other as the numerals 10, 100 and 1000.
- Measures: Dyscalculic children often have difficulty with operations such as handling money or telling the time. They may also have problems with concepts such as speed (kilometres or miles per hour) or temperature.
- Direction/orientation: Dyscalculic children may have difficulty understanding spatial orientation (including left and right), causing difficulties in following directions or map reading.

Dyscalculic children may be particularly vulnerable when teachers follow an interactive, whole-class method of teaching. Asking dyscalculic children to answer apparently simple maths questions in public could well lead to embarrassment and frustration.

Dyscalculia: Symptoms By Age		
Pre-School Children	School-Aged Children	Older Teenagers and Adults
Might have difficulties with:	Might have difficulties with:	Might have difficulties with:
• learning to count; • recognizing printed numbers; • linking the idea of a number (4) and how it exists in the world (4 horses, 4 cars, 4 children); • their memory when numbers are involved; • organizing things in a logical way – such as, putting round objects in one place and square ones in another.	• learning maths facts (addition, subtraction, multiplication, division); • developing maths problem-solving skills; • their long-term memory for math functions; • learning and remembering maths vocabulary; • measuring things; • playing games that require strategical skills.	• estimating costs, such as groceries bills; • learning maths concepts beyond the basic math facts; • budgeting; • concepts of time, such as sticking to a schedule or approximating time; • mental arithmetic; • finding different approaches to solving a problem.



How to Help a Child with Dyscalculia in Your Class

- **Be patient**

It can be very frustrating for a student to not be able to complete tasks. It is very important that you are patient with dyscalculic students and that you make sure that they understand that they can take their time.

- **Give extra time**

A student with dyscalculia may need additional time to complete tasks and you should take this into account. It is also possible to apply for additional time for examinations if the child's abilities fall below a certain threshold.

- **Provide differentiated work**

The child might not be able to complete the same tasks as others in the group. Although he or she will have to learn the same topics, in accordance with the curriculum, consider using different methods and resources to support the child in their learning.

- **Offer one-to-one support**

The student may need additional one-to-one support beyond the whole class approach to teaching. This will help you to put other strategies in place as well.

- **Use concrete apparatus**

Students with dyscalculia often find it helpful to use concrete apparatus instead of relying on printed resources and verbal teaching. This allows them to have a more kinaesthetic, or hands on, approach to their learning. Such apparatus might include counting blocks, rulers, clock faces, or fraction segments etc.

- **Give frequent praise, rewards and encouragement**

Many students with dyscalculia are embarrassed and frustrated by their difficulties. You can help to motivate them and make them feel proud of their progress by offering praise, rewards and encouragement for small steps of achievement.

- **Be prepared to teach concepts several times**

Many students only need to be given information once, or at the most twice, to understand a concept. Students with dyscalculia may need to learn the same concept or procedure over and over again before they begin to understand it.

- **Reinforce teaching**

Reinforce ideas and concepts by using several different approaches to teaching. Give the information verbally, then give it again in written form and then devise practical activities that will further reinforce the information.

- **Make others aware**

Make sure that all other adults involved in teaching or supporting the child are aware of his or her particular difficulties and have been taught some useful strategies to help.



What is Dyscalculia?

According to the British Dyslexia Association, Developmental Dyscalculia (DD) is a specific learning disorder that is characterised by impairments in learning basic arithmetic facts, processing numerical magnitude and performing accurate and fluent calculations. This means that an affected pupil will struggle during maths lessons – in particular arithmetic. It is estimated that between 5 and 10% of South Africans have some degree of dyscalculia.

Children with dyscalculia often have other developmental disorders such as dyslexia or ADHD. This is usually because of a poor working memory.

Children with dyscalculia often find it difficult to count backwards, need to resort to counting when trying to do arithmetic and have difficulty remembering number patterns despite lots of practice. Equally, they may struggle with estimation and becomes anxious and/or avoidant when challenged in maths lessons.

