

# IDL Dyscalculia Screener User Guide



## What is being tested?

Each element of the screener checks is designed to test several factors often affected by dyscalculia. As is the case with many learning difficulties, there are numerous factors which are briefly summarized below:

- Difficulty understanding concepts of place value, and quantity, number lines;
- Positive and negative value, carrying and borrowing;
- Difficulty understanding and completing word problems;
- Difficulty sequencing information or events;
- Difficulty using steps involved in math operations such as subtraction;
- Difficulty understanding fractions;
- Problems with money and making change
- Difficulty recognizing patterns when adding, subtracting, multiplying, or dividing;
- Difficulty naming mathematical processes and using correct language (e.g. edge, equals);
- Difficulty understanding concepts related to time such as days, weeks, months, seasons, etc.

## How does the test work?

The screener has been developed to provide a simple to use on-line test that will highlight any dyscalculic tendencies. The test is divided into nine separate tasks. This separation provides better identification of their specific numeracy SEN therefore allowing you to further tailor their intervention. We expect the test will take around 15 minutes to complete.

The tasks included in the test are as follows along with the key skills they focus on:

### Task 1 – Reaction time

We start with a test that will record the pupil's reaction time. We can use this figure to measure the pupil's response times on subsequent tests. This is not an essential metric to how the results are weighted as time taken is as much a demonstration of lower ability as it is dyscalculia. Some learners will require counting on their fingers or other supplementary methods and so the screener will not be weighted unfavourably in that regard. It does however provide a useful metric for the time taken and an indicator of potential dyscalculic difficulties.

During this test, we ask pupils to click on an object as soon as it appears. There are twenty repetitions in total, allowing for us to take a meaningful average.

### Task 2 – Number sense

The next task will ask pupils to compare symbolic numbers with non-symbolic numbers. Each question will ask the pupil whether the dot pattern on one side on the screen is the same as the Arabic number on the other. There are 20 repetitions in total. The first ten questions will use the standard Chinn dot patterns and the second ten will use a random patterns.

The purpose of this test is to demonstrate knowledge and ability of subitising – the visualisation of numeric values as quantities (e.g. dots). Such approaches are critical in learning to count and furthermore any difficulties in that respect can indicate dyscalculic issues. The variation between regimented patterns of dots and randomised is to further test that the learner understands cardinality (the value) of the dots and is not recognising the patterns from dominoes or similar activities they may have undertaken.

### **Task 3 – Number value**

This task will ask pupils to identify the greater of two amounts. There are a total of 20 repetitions. The first ten will see pupils comparing non symbolic Chinn patterns and for the second, they will compare Arabic numbers.

Again, this tests their ability to subitise numbers but also the rate at which they can identify if a number is higher or lower than another value. Learners with dyscalculia can experience difficulty relating mathematics to the real world and so struggle with the potential of something being 'more' than another. This would be evident in many comparison tasks in more profound cases and scoring low in this task would be an indicator of low ability in counting skills if not dyscalculic tendencies.

### **Task 4 – Arithmetic**

This task will ask pupils to identify whether simple maths statements are correct. There are 20 repetitions of varying difficulty. They include both addition and subtraction.

The objective of this task is to test numeracy skills and dyscalculic tendencies equally. A low score in this test could be as indicative of low ability as much as it is any SEND and the tutor will have the educational context of the learner necessary to make that distinction. The task ascertains the learner's ability to visually process problems and correctly identify the symbols used for numbers and what they represent (e.g. correspondence – that the number 3 means that there are 3 units and together they total 3)

### **Task 5 – Visual memory**

This task provides a test of visual memory. Pupils will be shown a series of one, two, three and four digit numbers. Each number will be displayed on screen for a number of seconds. Once removed from screen the pupil must identify the number they have seen from a set of four. There are a total of ten repetitions.

Dyscalculic learners often have difficulty moving numbers and patterns from the short to long-term memory. This difficulty not only applies to patterns but also longer mathematical problems where an earlier value needs to be retained for later. Lower scores here may also indicate a problem with place value as numbers with more than one digit may be unfamiliar or confusing to the pupil.

### **Task 6 – Auditory memory**

This task provides a test of auditory memory. Pupils hear a number spoken and must then remember this number for a period of time before identifying it from a collection of four. There are a total of ten repetitions.

The numbers are read aloud in their individual format rather than as a complete figure (e.g. 123 being "One. Two. Three." instead of "one hundred and twenty-three") because the task is focused on their ability to recall a series of numbers rather than any knowledge of place value. Whilst this task is similar to the previous, it is intended to help quantify the difference between a processing difficulty and their level of ability.

## Task 7 – Visual pattern memory

This task tests a pupil's ability to remember a given pattern for a number of seconds. There are ten repetitions with the patterns shown increasing in complexity and number of elements.

Pattern recognition is another skill affected by dyscalculia and the difficulty in transferring information from the short to long-term memory. Lower scores in this task may indicate a poor memory or lack of concentration.

## Task 8 – Number Stroop

This task will test a pupil's ability to identify the greater of two amounts whilst at the same time ignoring their physical size and relationship.

A learner will need to identify the value represented by the Arabic number and not the physical size of the number itself. Mathematical language is being examined here as much as their understanding as they will need to recognise that 'larger' is referring to the value and not the format. Lower-ability pupils may misunderstand the question however those with extremely low scores to this point may well be dyscalculic as they misunderstand that the 'larger' digits must be worth more. Furthermore the longer a pupil takes to answer these questions, the more likely they are to be experiencing some kind of dyscalculic complication.

## Task 9 – Sequencing

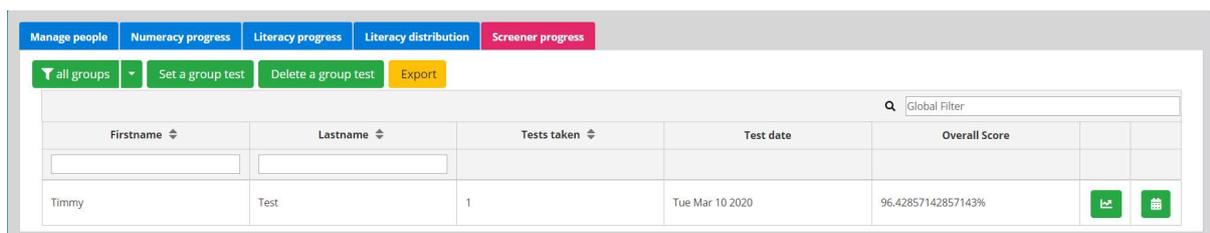
The final task we see pupils testing their ability put things in sequence based on shape or colour. Pupils will be asked to identify the missing shape or shapes in a given sequence. There are ten repetitions of varying difficulty.

In the same way as tasks 6 and 7, the pupils' ability to recognise and continue patterns are being examined except here it is using numerically agnostic shapes. Scoring well on this task but lower on the aforementioned ones may provide further indication of dyscalculia as they struggle with recognising numerical values instead of shapes.

## Interpreting your results

In order to interpret the results, it is important to compare pupils' scores from the same age group only. You will be able to easily identify those pupils with a much lower overall score. These will be the pupils who may experience dyscalculic-type difficulties.

To access a detailed breakdown of their answers, access IDL and click on 'Screener Progress' under your pupil management tab.



Firstname	Lastname	Tests taken	Test date	Overall Score
Timmy	Test	1	Tue Mar 10 2020	96.42857142857143%

The overall score represents the percentage of correct answers they provided across all 9 tasks. An average score for that class will indicate that the pupil is unlikely to be dyscalculic

however by clicking the 'Progress in Screener' button they can access records of how long was taken on each question and if they were correct. Whilst there is a large amount of data, the most prominent ratio would likely be the time taken vs. number of correct answers. If the pupil is spending an unusually long time to answer questions incorrectly, it is possible they have some form of dyscalculia.

Children who are unable or struggle to describe their process when asked about arithmetic are more likely to have some form of dyscalculia and so we advise tutors to repeat some tasks with the pupil to gain a better idea of their difficulties.