
Dyscalculia

Math is an active process, consisting of the (re)ordering of information, carrying out of thinking actions, solving problems and information processing, such as analysing, comparing information with existing knowledge, keeping information available in the working memory and checking it in between. This also involves the fluent and accurate generate and applying of knowledge of the basic skills of math. This knowledge must be automated and preferably memorised . Students who have dyscalculia can struggle with mathematical calculations and spatial insight.

Emergence of severe difficulties with maths and dyscalculia

Serious problems can be caused by insufficient alignment between education (in maths) and the educational needs of the student. The characteristics of the education do not, or do not sufficiently, match the (innate and acquired) characteristics of the student. In other words, there is a discrepancy between the student's general development and his maths development. There is dyscalculia if serious math problems, despite long-term expert guidance and careful coordination, prove persistent and remain unchanged (Protocol Serious Arithmetic and Mathematical Problems and Dyscalculia, 2012).

Characteristics

Every student, including every student with dyscalculia, is different. Preferences in learning style, intelligence, age, character etc. influence whether the characteristics below are expressed in someone with dyscalculia.

Positive characteristics

- Image thinkers.
- Logical (systems) thinking skills.
- Creative thinkers, because solution-oriented thinking is often used as a coping strategy.

Impairing characteristics

- Difficulty distinguishing, recognising and giving meaning to numbers.
- Experiencing problems related to the strength and/or organisation of the memory (both working memory and long-term memory), as a result of which simple maths tasks have to be recalculated over and over again, often with various intermediate steps.
- Difficulty using maths procedures in other situations.
- Difficulty with maths procedures: solving intermediate steps adequately and in the right order.
- Difficulty with insight into and notion of space and little awareness of time. For example, difficulty in adequately placing numbers on a number line, geometry and putting large numbers in the right order.

Tips

It is not so much about the characteristics, but about the extent to which the student experiences obstacles during the study. Below, some tips are mentioned per educational activity that can help students with dyscalculia. Students with other disabilities or support needs may experience similar barriers and also benefit from the tips. Talk to the student to find out what helps or works best.

Contact hours

(lectures, working groups, etc.)

- Provide support in planning study tasks.
- Provide fixed instructions step-by-step for carrying out tasks.
- Provide a separate room for working in quiet.
- Stimulate: show understanding and encouragement.
- Individual, task-based and direct instruction is best for students with severe difficulties with maths or dyscalculia.
- Keep learning steps in instruction small and pay attention to structure and repetition, even more so than for students without numeracy problems.

Assessing and examining

- Allow the use of a formula sheet, step-by-step plans or strategy booklet/search booklet (provided that it does not affect the learning objectives).
 - Allow the use of a calculator (so long as it does not affect the learning objectives).
 - Allow extra time for maths tests.
 - Allow the use of scrap paper, so that students can write down intermediate steps (this relieves working memory).
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Independent study tasks

- Provide support in planning study tasks, as well as in planning the task itself, such as by working with solution schemes.
- Reduce the size or complexity of the study task where necessary.
- Offer written out example solutions to particular maths tasks.
- Allow the use of memory cards and/or strategy cards.
- Allow the use of an overview of mathematical facts and rules (provided that this does not compromise the learning objectives).
- Visualise the sum for complex sums that require several steps. Verbal support can also help with such sums.
- Also evaluate the calculation instead of just the result.
- Have the calculation explained verbally.

Internship and graduation projects/theses

- Discuss in advance how the student can deal with dyslexia during the internship.
- Find a suitable work placement in relation to the student's obstacles and the objectives to be achieved.

Note: this overview is not complete.

More information

- [ECIO, expert centre on inclusive education](#)
- [Hogeronderwijstoegankelijk.nl/en](https://www.hogeronderwijstoegankelijk.nl/en)
- [British Dyslexia Association](#)
- [Masterplan Dyscalculie \(Dutch\)](#)
- [Proef op de Som – Studeren met Dyscalculie \(Dutch\)](#)
- [Protocol Ernstige Reken- en Wiskunde problemen en Dyscalculie \(Dutch\)](#)
- [Website Ernstige Reken- en Wiskunde problemen en Dyscalculie](#)

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