Adjustments for Dyscalculia

Dyscalculia (which is more formally called a Specific Learning Disorder with impairment in Mathematics) is a difficulty with maths. Students with dyscalculia may often have difficulties with number sense, understanding and manipulating numbers, learning maths facts and undertaking calculations and more complex operations.

This InfoSheet provides information about adjustment for classroom and homework, assessments, programming and intervention for students with dyscalculia and maths difficulties. These adjustments can also be used to support students who have maths difficulties but may not have a diagnosed specific learning disorder.

The Disability Discrimination Act 1992 Cth makes it unlawful for an education authority to discriminate against a student because they have a disability. Educators must offer students with disability the same educational opportunities as students without disability.

Educators must make changes or "reasonable adjustments" to how a student with disability accesses a course, the course delivery and the assessment procedures. Educators do not need to make a change if that change will cause "unjustifiable hardship".

Dyscalculia is a disability under the Disability Discrimination Act.

Similar protections are available under the Anti-Discrimination Act (1977) NSW.

Adjustments help ensure that students with dyscalculia or maths difficulties can access and participate in education on the same basis as their peers. Adjustments can be made to planning, teaching, assessments & reporting, the environment and resources.

Teachers make adjustments by modifying or changing the way they:

- plan and prepare programs, materials and activities
- provide instruction and present information to students
- have students practise and revise information and complete work in the classroom or at home
- assess and report on students
- set up the classroom and school environment

in order that students with dyscalculia or maths difficulties can access the syllabus outcomes and content and demonstrate their skills and knowledge.

Planning and Programming

The Disability Standards for Education 2005 clarify the obligations of education providers to ensure that students with disability can access and participate in education on the same basis as students without disability.

The Standards provide that when considering an adjustment for a student with disability, the education provider must:

- **consult with the student** (and their parents or guardians) about whether the adjustment is reasonable, whether the adjustment would allow the student to participate on the same basis as a student without disability and whether there is any other adjustment that would be less disruptive and intrusive and no less beneficial
- **decide on the adjustments** to be made to enable the student to participate on the same basis
- **make the adjustments in a reasonable time**
- consult the student and **review the adjustments** as necessary to allow for the changing needs of the student over time.

Programming Adjustments
Teachers plan and program for the most appropriate way for students to access the curriculum. This includes considering which syllabus outcomes best suit the needs of the student.

- Collaborative curriculum planning is the process outlined by NESA to determine the appropriate programming, classroom and assessment adjustments for a student with disability, taking into account the needs, strengths, goals, interests and prior learning of the student.

Nationally Consistent Collection of Data NCCD

Schools have an obligation to report the adjustments made for students who have a disability (or who the school imputes have a disability on reasonable grounds) to the NCCD (the Nationally Consistent Collection of Data on School Students with Disability).

Under the NCCD, schools are required to:

- have procedures for recording and storing evidence
- assess the **functional impact** of the student's disability or imputed disability (the impact on teaching and learning, communication, participation, personal care and movement)
- provide **reasonable adjustments** to assist the student with disability to access and participate in education on the same basis as other students for at least 10 weeks in a 12 month period. Before making reasonable adjustments, **consult** with the student (and their parents or guardians) about the adjustments
- determine the **NCCD level of the adjustments** provided - support provided within Quality Differentiated Teaching Practice, Supplementary, Substantial and Extensive. The NCCD has prepared this helpful Guide to choosing the Level of Adjustment
- determine the NCCD category of the student's disability – physical, cognitive, sensory and social/emotional
- **record and retain evidence of adjustments**, consultation and collaboration with the student (and their family), monitoring and reviewing of adjustments and then review that evidence and approve the NCCD data before it is submitted to the NCCD.

Students who must be included in the NCCD are those students who have a disability or those students who the school imputes (judged to exist) have a disability on reasonable grounds and who receive reasonable adjustments because of the functional impact of that disability.

The Federal Government uses the information about the number of students receiving the different levels of adjustments reported to the NCCD to provide funding to support students with disability to schools and school systems.

Adjustments and Student Plans

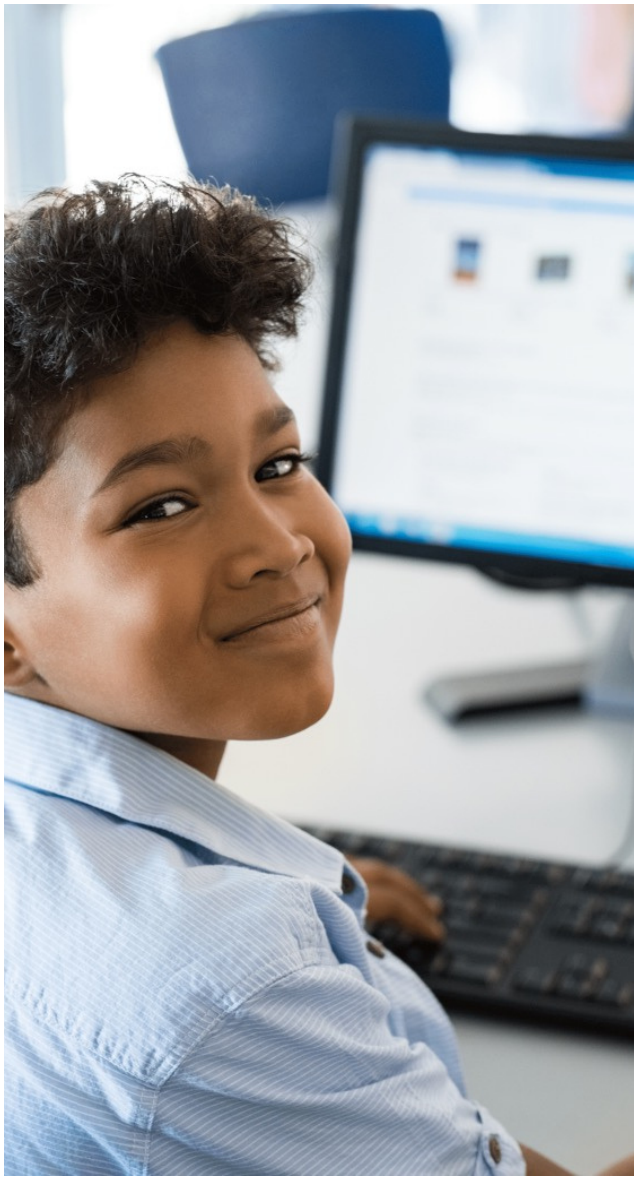
It is best practice to document the adjustments for classroom and homework, assessments, programming and intervention that a student with learning difficulties or disabilities is receiving in a Student Plan.

Student Plan

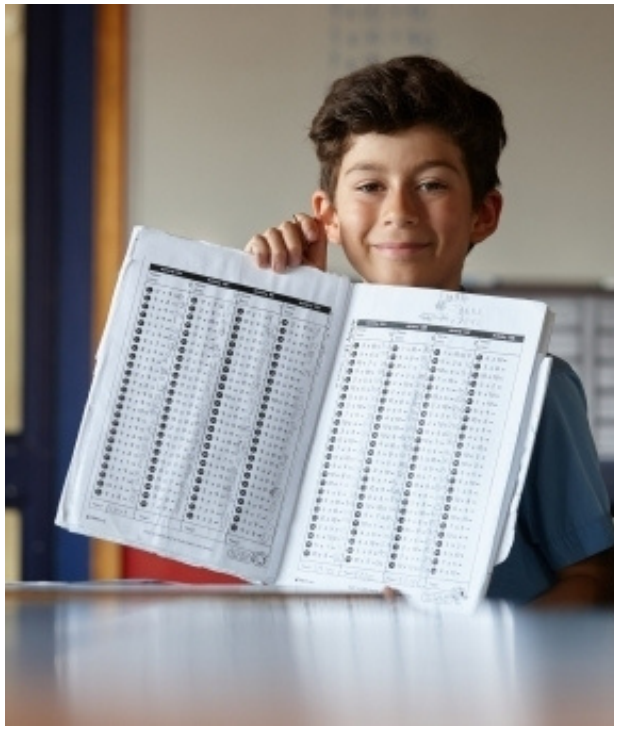
A Student Plan (commonly called an Individual Education Plan (IEP) or Personalised Learning and Support Plan (PLSP)) is used to document adjustments for classroom and homework, assessments, programming (or curriculum), and intervention provided to a student with a learning difficulty or disability to enable them to access and participate in education on the same basis as students without disability.

A Student Plan (an IEP / PLSP) can be used as evidence when recording adjustments for the NCCD.

A Student Plan (an IEP / PLSP) should be developed by the team supporting the student including their parent or guardian, classroom teacher/s, learning support staff, school leadership and the student.



Intervention for students who have dyscalculia or math difficulties



The provision of intervention to support students who have dyscalculia or maths difficulties is essential to enable these students to continue to develop their maths skills.

Students who have difficulties with mathematics should have their maths skills assessed to allow for explicit, systematic and evidence-based intervention that targets their areas of difficulty.

Such interventions can include explicit, systematic intervention in number, calculation, maths facts, place value, and maths vocabulary.

Such interventions may involve the student working on developing accuracy and fluency in maths taught to earlier ages and stages.

While students are developing their maths skills, adjustments can be provided to allow them to access the learning in the classroom and demonstrate their knowledge in assessments.

Adjustments for students dyscalculia or math difficulties

Each student with dyscalculia and maths difficulties will have different needs for adjustments. Set out in this InfoSheet are adjustments that can be used to support students with dyscalculia or maths difficulties based on their different needs.

The following pages outline homework, classroom and assessment adjustment options and some best practice inclusive teaching practices to support ALL students with mathematics.

Classroom and homework adjustments for students with dyscalculia or math difficulties

Student's area of difficulty	Classroom and Homework Adjustments
Difficulty with number sense and learning and using maths facts	
These students may: • have difficulty recognising numbers • have difficulty with fundamental math skills such as counting, number magnitude and relationships, place value, sequencing and operations • have difficulty with mental computations (e.g. adding numbers in their mind) • have difficulty remembering maths facts (e.g. 2+2=4; 5+5=10; times tables) • continue to use inefficient maths strategies	• Provide mini-whiteboard or note paper for students to use as working paper and to allow students to draw the problem. • Provide maths manipulatives to allow the student to represent number and number facts. • Provide students with charts or other resources for use during mathematical calculations and multi-step problems, e.g. number charts, number lines, addition/subtraction charts, multiplication/division charts, hundreds charts and mathematical rulers with number facts. • Focus instruction and practice on learning a few number facts to mastery at a time. • Explicitly teach and provide opportunities to practice efficient strategies, e.g. counting on rather than counting all. • For students in upper primary and high school, allow the use of a calculator and/ or computer software programs. Provide a calculator which shows both the question and the answer. • For students in high school, provide additional support with understanding and using class, assessment, and exam timetables.

Classroom and homework adjustments for students with dyscalculia or math difficulties

Student's area of difficulty	Classroom and Homework Adjustments
Difficulty with written mathematical workings	
Difficulty with written mathematical workings These students may: • have difficulty with presentation and layout of mathematical workings • have difficulty with diagrams and graphs • have difficulty distinguishing between mathematical symbols • substitute or transpose letters, numbers, signs and symbols	• Provide graph paper 10mm size or larger to assist with lining up written work. • Design worksheets with clearly set out questions and larger spaces to write answers. • Enlarge graphs, tables and drawings. • Highlight maths symbols and provide mathematical symbol charts. • For students in upper primary school and high school, allow the use of assistive technology to record mathematical working, e.g. ModMath

Student's area of difficulty	Classroom and Homework Adjustments
Difficulty with mathematical language and vocabulary	
These students may: • confuse maths language and vocabulary • have difficulty with word problems.	• Provide a glossary of terms or age-appropriate maths dictionary. • Provide explicit instruction on key maths vocabulary. • Adjust worded problem questions to simplify the language.

Classroom and homework adjustments for students with dyscalculia or math difficulties

Difficulty with mathematical calculations and reasoning	
These students may: • have difficulty with multistep maths problems • get lost while completing mathematical problems and may switch procedures • have difficulty applying maths concepts, facts and processes • have difficulty understanding maths concepts and processes	• Scaffold maths problems by breaking them into steps. Use graphic organisers or structured worksheets to break problems into steps. • Provide a list or diagram of steps in a mathematical process. • Provide formula charts. • Provide mini-whiteboard or note paper for students to use as working paper and to allow students to draw the problem. • Provide maths manipulatives to allow students to display and visualise mathematical problems. • Provide access to annotated worked examples for common maths problems. • For students in upper primary and high school, provide access to video presentations explaining steps in common maths problems, e.g. Khan Academy, WooTube. • For students in upper primary and high school, provide access to assistive technology to allow them to check their work, e.g. photomath or a calculator. Provide a calculator which shows both the question and the answer.

Classroom and homework adjustments for students with dyscalculia or math difficulties

Student's area of difficulty	Classroom and Homework Adjustments
General adjustments for students with maths	
These adjustments can assist all students with maths difficulties	• Ensure students have multiple opportunities to practise new skills, concepts and processes to achieve mastery before moving on to more complex tasks. • Provide early corrective feedback so students do not practise maths problems with errors. • Avoid timed maths activities and tasks if these cause the student stress. • Avoid peer marking of students' work. • Do not keep students in class during break times to complete unfinished class work, or require students to complete unrealistic amounts of work within limited time frames, or work beyond their ability at home. Instead, adjust the amount and/ or complexity of work to be completed. • Provide parents/ carers with access to important information including homework and assessment task requirements, and topic summaries.

Adjustments to In-School Assessment Tasks for students with dyscalculia or maths difficulties

Schools are able to make adjustments to in-school assessments tasks for students with dyscalculia or maths difficulties. Adjustments to assessment tasks enable students to demonstrate their skills and knowledge.

- Adjustments to the **assessment process** can include:
  - Using a scribe/writer
  - Giving extra time in an exam or to complete take-home tasks
  - Providing rest breaks
  - Providing additional working paper, graph paper, additional space for showing working out
  - Scaffolding instructions
  - Providing time guidance for each section in an exam
  - Providing additional information, e.g. providing a vocabulary chart, or formula sheet or maths facts charts
  - Providing a quiet or separate area to undertake examinations to reduce distractions when using a scribe/writer

- Adjustments to the **assessment activities** can include:
  - Rephrasing worded problem questions
  - Scaffolding assessment questions into steps
  - Setting an alternative task
  - Reducing the number of questions to allow additional time per question

- Adjustments to the **response format** can include:
  - Providing a computer or assistive technology to complete the task
  - Providing of graph paper 10mm size or larger to provide responses
  - No reduction in marks for messy or illegible handwriting and presentation.

If adjustments have been provided to allow a student to access an assessment, then this should not restrict the student's access to the full range of grades or marks for that assessment.

For InfoSheets about adjustments available to students completing the HSC, NAPLAN or the HSC Minimum Standard for Literacy and Numeracy Tests please refer to the SPELD NSW website.

The SPELD NSW website also has InfoSheets on adjustments for students who have difficulties with reading, spelling and written expression and use assistive technology to support students with literacy and numeracy difficulties.

Best Practice Inclusive Teaching Strategies to support ALL students with maths

These best practice inclusive teaching strategies can be used in classrooms to support ALL students with maths.	
• These best practice inclusive teaching strategies can be used in classrooms to support ALL students with maths. • Providing whole class explicit instruction and modelling of new maths concepts. • Provide whole class daily reviews (or regular reviews) and other opportunities for spaced practice of taught skills and concepts to achieve mastery learning. • Explicitly pre-teach the spelling and pronunciation of key maths vocabulary. • Check for student understanding before assigning individual work or homework, and ensure mastery before progressing to more difficult tasks and skills. • Adjust oral communication when giving instructions and teaching to support students with working memory difficulties. • Do not introduce timed tasks until students are able to complete the task with accuracy. • Use visual representations and manipulatives to demonstrate mathematical concepts at all grade levels.	• Provide information to students using a mix of written, video, oral, and visual displays. Allow students to have later access to all of the materials to clarify and revise learning. • In upper primary and high school, provide all students with copies of the presentation or notes from the board or allow any student to take photos of the board. • In upper primary and high school, teach evidence-based study skills. • Ensure documents provided to students are designed and edited to allow all students to access the key information with ease, e.g. annotated worked examples and highlight tasks to be completed with due dates. • Ensure all students have opportunities to succeed in the classroom and recognise student effort over outcome. • Promote a culture in the classroom of being a safe environment to talk about difficulties with maths (without identifying individual students).

REFERENCES

WEBSITE	LINK
Association of Independent Schools - Planning Support and Resources (aisnsw.edu.au)	
AUSPELD Specific Learning Disorders Flow Chart (auspeld.org.au)	
Disability Standards for Education 2005 - Disability Standards for Education 2005 (legislation.gov.au)	
Dyscalculia.org - School Accommodations (dyscalculia.org)	
NCCD Website (nccd.edu.au)	
NCCD Guidelines (https://www.nccd.edu.au/tools/nccd-guidelines-0)	
NCCD Planning for Personalised Learning and Support: a National Resource (nccd.edu.au)	
NESA – Adjustments: Adjustments (https://educationstandards.nsw.edu.au/)	
NESA – Assessments: Assessment and reporting (https://educationstandards.nsw.edu.au/)	
NESA - Collaborative Curriculum Planning: Collaborative curriculum planning (https://educationstandards.nsw.edu.au/)	
NESA - Special Education: Special education (https://educationstandards.nsw.edu.au/)	
NSW Department of Education – Adjustments to teaching and learning: Adjustments to teaching and learning (nsw.gov.au)	
NSW Department of Education - Personalised Learning and Support: Personalised Learning and Support (nsw.gov.au)	
Understood - Classroom Accommodations for Dyscalculia	