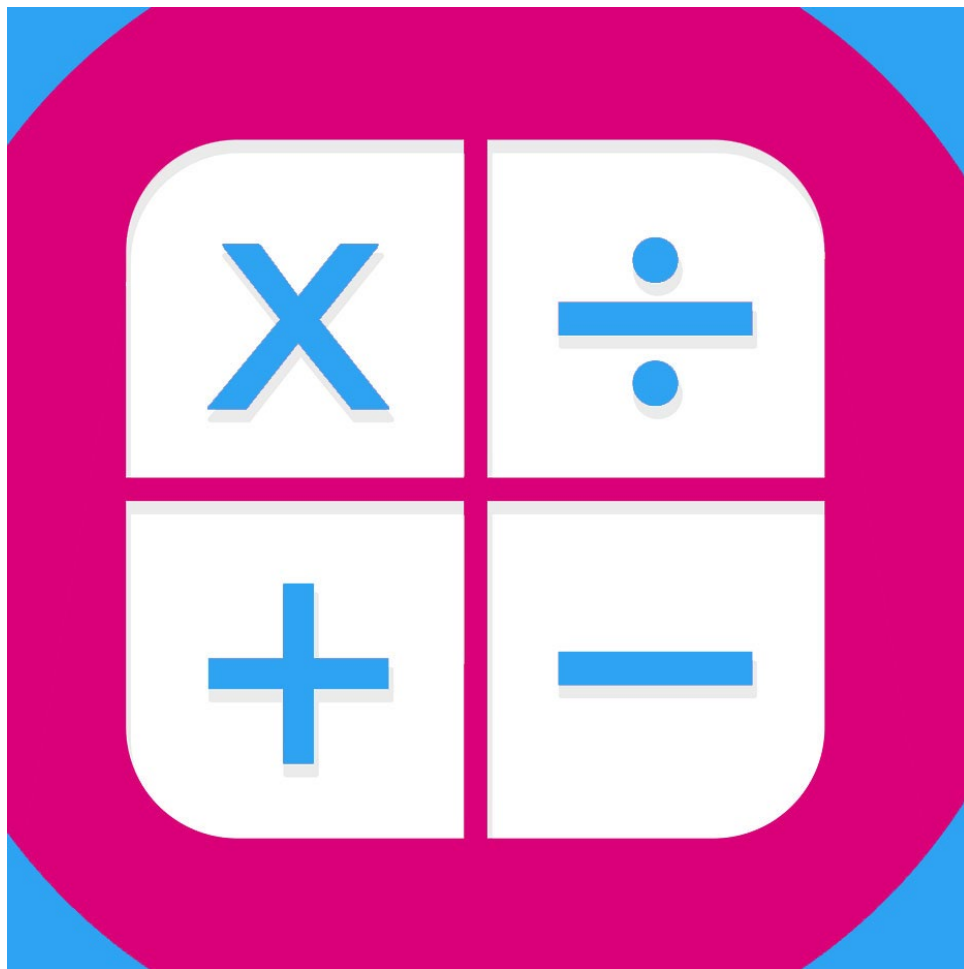

Teaching Maths to pupils with Down Syndrome



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To teach a student with Down Syndrome effectively, a knowledge of the specific learning profile is essential, and how the factors that inhibit and facilitate learning are especially relevant to mathematical learning.

All children and young people with Down Syndrome have different strengths and barriers to learning, but with an awareness of the Profile for Learning you can plan and differentiate maths lessons to compliment the individual.

The Learning Profile: Strengths

- Strong visual learning skills
- Kinaesthetic learners
- Ability to use sign and gesture
- Ability to read by whole word recognition
- Ability and desire to learn from peers
- Learn best from pictorial, concrete and practical materials
- Keen communicators despite language problems
- Respond well to structure and routine

The Learning Profile: Barriers to Learning

- Delayed fine and gross motor skills
- Auditory and visual impairment
- Speech and language delay
- Short term auditory memory difficulties affecting listening, processing, storing/remembering and sequencing
- Shorter concentration span
- Consolidation and retention problems
- Generalisation, thinking and reasoning
- Avoidance strategies

Teaching approaches which capitalise on the strengths of the learning profile of young people with Down Syndrome are more effective in communicating number concepts. So, consider the language and memory delays and reteach all key concepts again and again. Acknowledge that even very simple number concepts such as 'more than' may need to be explicitly taught using tangible materials and consistently use visual and concrete resources to reduce demands on the working memory.

Resources and schemes which visually illustrate the relationship between numbers seem to be more effective.

Numicon is an obvious and proven resource to support an understanding of the number system, place value and counting.

White Rose Maths use pictorial representations and manipulatives which fit the profile of our learners. Ensure that strategies are taught and retaught until understood, before moving on to a different strategy or concept. (www.whiterosemaths.com)

Maths for Life supports the profile of Down Syndrome and provides resources, games and strategies to aid the teaching of mathematical concepts. (www.mathsforlife.com)

Mathematics has a strong visual element, and this can often be used to illuminate meaning. Visual teaching methods include:

- frequent use of a number line
- a 100 square
- number apparatus
- pictures
- diagrams
- graphs
- computer programs and apps

Recent research suggests that the use of computer software enables better learning of core maths skills than spending similar periods of time working with pen & paper. This may be because:

- Maths software is highly visual
- Students have full control & can progress at their pace
- The software is endlessly patient: a student can repeat a task ad infinitum if they so wish, and it will give them time to process & respond
- The student is not required to speak
- Manipulating a mouse may be easier for many students with DS than manipulating a pencil

Structured activities that include *errorless learning*, such as matching and selecting games can help many students with Down syndrome learn new concepts.

Teaching new concepts through matching, selecting, and naming

1. Start with matching

The student is asked to match by putting the object, picture or card with the one that is the same. This is the step in which you are teaching the new concept, so it is important to use the appropriate language e.g. "This is a 50p coin, can you put it with the other 50p coin?" Once the young person can match items correctly, move on to selecting.

2. From matching to selecting

The student is now asked to select each of the items by name e.g. "Can you give me (or show me) the 50p coin?" Once the student can demonstrate correct comprehension of the words by selecting the items correctly, move to naming.

3. From selecting to naming

The items are named accurately on request when asked, "What's this?" Extra practice at naming functional items may be necessary to improve speech clarity, e.g. "one pound coin."

Progress in small steps; teach one part of a skill that can then be built on by learning the next part in later games. This will

- avoid overwhelming students with too much new information at once
- help young people to do things for themselves
- require less spoken explanation

In most curriculum areas, whole class learning can be differentiated to suit the learning profile of your child with Down Syndrome. In maths, this is often trickier due to the fact that your child is likely to need longer to understand basic concepts and mathematical vocabulary. There is nothing wrong with a student following their own maths curriculum alongside their typically developing peers, as long as the young person is seen by themselves and their peers as working on their maths at the same time and in the same room as everyone else.

Further support

Our School Liaison Service can provide further advice and support. Contact us by emailing: info@upsanddowns.net

