

Unit 6: Developing Writing Skills

a) Fine motor development

The development of fine motor skills in children with Down syndrome usually follows the same pattern as that of typically developing children but with some delay. They therefore reach milestones later than their peers but also tend to perform skills less well, although there is a wide range of variability, with some yr 7 pupils for example, able to write homework and a learning objective down accurately in a similar way as their peers whilst other pupils will need a significant amount of support and a different approach to achieve this. Difficulties are especially noticeable in the early years and primary age range, but tend to decrease over time. As the children grow older, most are able to achieve a perfectly adequate level of dexterity to enable them to participate in everyday life.

All motor skills improve with practice. Every time we perform a particular motor sequence or movement, the neural pathway (the connections made between the brain and the muscles involved) is reinforced again and again and we get better at performing the movement. Also, the more we use our muscles the stronger they become. It is vital therefore that children are given additional and appropriate practice and encouragement, from an early age, to develop their skills as much as possible. For some children with extreme finger and hand weakness, advice from an occupational therapist or specialist teacher for pupils with physical difficulties may be helpful.

There are several reasons why children with Down syndrome may have delayed motor development:

Possible causes of delay 1: Cognitive skills

Research suggests that children with Down syndrome have difficulties processing the information they receive from their senses and then co-ordinating their movements. This process takes longer than in typically developing children. Their motor-neuro pathways are relatively inefficient and take longer to become established. They may, therefore, need more practice than their peers to develop and establish these pathways in a similar way to a child with dyspraxia. In addition, the more complex the task, the more difficulty the child has translating it into action. Tasks which require faster perceptual and cognitive judgements, are particularly hard, as they demand a greater level of co-ordination and planning. Studies also show slower reaction times, with difficulties in adapting movements: asking children to tap faster resulted in them tapping with more pressure rather than increasing the speed (Frith & Frith, 1974).

As a result of the above factors, although the muscles themselves can perform the movements, they are often performed in a slower, more clumsy or un-coordinated manner.

Possible causes of delay 2: Hypotonia

Children with Down syndrome commonly have hypotonia, although this tends to decrease with age. Hypotonia means low muscle tone and affects both gross and fine motor skills. However, the precise effects on the development of motor skills are not clear and more research is needed to investigate this further.

Possible causes of delay 3: Loose joints and ligaments

Ligaments are attached to joints and connect bones together. In children with Down syndrome, the ligaments are looser and stretchier, enabling a wider range of movement and flexibility. An example of this is often seen in the hip joints of children who can sit cross-legged with both knees flat on the floor and their feet resting on their knees. The thumb joint can also be particularly lax causing additional difficulties when manipulating small objects and developing pencil control. Again, more research is needed to clarify the affect of this additional flexibility on the development of motor skills.

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Possible causes of delay 4: Hand formation

The hands of children with Down syndrome are often smaller and the fingers shorter and stubbier. The thumb is often set lower down. Some children may not have all of the usual wrist bones. These factors will inevitably affect the ability to hold and manipulate objects.

b) How to develop fine motor skills

The following factors should be considered when working on improving the fine motor skills of children with Down syndrome:

Improving skills 1: Stability

Good seating and positioning are critical in providing the stability needed to keep one part of the body still while moving another e.g. writing, tying laces. Also:

- Check that the chair and desk are the right size for the child.
- Knees should be in line with hips and feet flat on the floor, directly under the knees. If necessary, place a footrest under the feet. This could be a standard one or you could simply use a telephone directory).
- Elbows should rest comfortably on the desk.
- Working on a slanted surface or writing board can help children sit up straight for longer.
- A variety of different working positions and techniques (e.g., short periods working at the computer, desk, on carpet) may help the child work for longer.
- Allow short breaks to compensate for tiring more quickly than their peers.

Improving skills 2: Hand exercises

Before, during and after activities, encourage the child to do a variety of exercises to increase awareness of their hands and fingers, stimulate or relax them and restore blood flow, e.g.

- Open/close hands slowly and rapidly.
- Shake hands and rub them together.
- Tap thumbs to each fingertip in turn.

Improving skills 3: Strengthening activities for wrists and hands

It can be useful for the younger child to have a collection of items specifically chosen in order to improve strength in wrists and hands and improve finger dexterity. These can be contained in a brightly coloured box and offered at times when your child has finished their activity earlier than their peers or simply needs a change of activity. They could be:

- A stress ball or small squashy ball – the child can count the seconds before it regains its shape.
- Tearing paper for collages or papier-mache.
- Finger puppets.
- Wind up and squeaky squeeze toys.
- Pop-together beads, Lego and Multi-link.
- Small items such as macaroni to pick up and put into bowls or small cups. Pick up using pincer grip – thumb and first finger or use a pair of tongs.
- Coloured clothes pegs; the child can clip them onto the side of a box or tin.

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- Sponges or cloths to wring out.
- Tiddlywinks.
- Hammering pegs.
- Stacking cups, Russian dolls.
- Small bits off plasticine/play dough to roll into balls or snakes.
- Bull-dog clips and pegs.
- Plasticine for pinching small bits off and rolling into balls or snakes.
- Squeaky squeeze toys.
- Jumpy frogs, and Tiddly-winks.

Improving skills 4: Activities to develop perceptual skills & hand-eye co-ordination

Developing sensory awareness will aid development of motor skills. Children may need help with perceptual and spatial awareness, e.g. the ability to place a mark with finger or pencil on a selected point, to move from left to right and top to bottom, beginning in the top left corner etc. Start with large movements involving the whole arms before trying smaller, finer movements and introduce a range of activities, which use a multi-sensory approach:

- Finger painting – use paint, flour, powder, sand, spray foam etc.
- Matching or tracking; connecting two identical pictures or shapes together with a pencil line.
- Touch screen activities.
- Finger rhymes.
- Building and stacking bricks, rings etc.
- Chalking on blackboard.
- Threading beads and lacing activities.
- The Lacing Shoe.
- Drawing circles, vertical and horizontal lines beginning on a green dot and ending on red.
- Dot to dot activities, mazes and stencils.
- Making shapes with play dough.
- Magna doodle, Etch a Sketch type resources.
- Magnetic fish games.
- Peg boards, inset puzzles.
- Teach the words and meanings of “top”, “bottom”, “up”, “down”, “round” etc.
- Help develop an awareness of drawing a “person” – face and features, body, legs and arms.

Improving skills 5: Cutting

Cutting is a higher-level fine motor skill and often popular: There are also many commercial books with cutting templates which can be photocopied.

- Blunt ended metal scissors work best.
- Spring-loaded or self-opening scissors position the hand automatically in the thumb-up position and only need squeezing to close.
- Double-handed scissors enable adult hands to use the scissors behind the child's hands, to guide with the squeeze/release movements.

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- Cutting straws and paper strips are good early cutting activities.
- Card and heavy paper are easier to cut than normal paper.

Developing pencil grip

Initially children hold the pencil in their palm – “palmar grasp”. Gradually the fingers extend out and the pencil is held between the thumb and fingers in a rather clumsy grasp but most of the movement comes from the wrist and arm. This is a “static tripod”, or “immature tripod” grasp. Finally children develop a mature grasp holding the pencil between the tips of the thumb and first two fingers, and use small hand movements to control it – the “dynamic tripod grasp”. The ideal finger position is between 3/4 – 1 inch from the pencil tip. Children with Down syndrome often persist in using the immature tripod, anchoring the pencil against the base of the thumb and the side of the hand rather than using the tip of the thumb. They may need additional encouragement and activities to develop the correct grip:

- Use pegboards, which encourage the thumb and fingers to pick pegs up in a tripod grasp.
- Use short stubs of crayons or chalk that won’t fit into the palm.
- Use triangular pencils/crayons/thick markers or pencil grips to help cue the child to use a tripod grasp.
- Handi-writers are helpful for some children and are designed to correct their grip and position for improved handwriting – they consists of a fabric loop which goes around the wrist, and another which loop goes around the top of the pencil. There is also a plastic charm on the loop which the child grips in their palm. This action encourages the perfect grip and gives stability.

Hand dominance

Some children with Down syndrome can take longer to develop a dominant hand and change tools from one hand to the other. Much of this may be due to their hands becoming tired. If the pupil continues to swap hands and it does not become clear as to which is the dominant hand, place a pencil on the table centred between the child’s hands. See with which hand the child most often picks it up. Which hand does the child use to brush their hair or clean their teeth? Offer them a hairbrush and toothbrush to find out. Children may not establish a dominant hand until later. Once the dominant hand is clear, encourage the use of that hand in all activities.

Pencil pressure

Pressure can be affected by position, type of grasp used and type of pencil. Most children use too little pressure resulting in lines that are faint and wobbly.

- Felt tip markers are easier than a pencil and give more motivating results.
- Pencil grips may enable the child to hold the pencil more firmly and thus apply more pressure.
- A sloped writing board, or to be less conspicuous, resting on a ring binder or lever arch file can make writing far easier. It may also help with better focusing and avoidance of the child leaning over the desk.
- Writing on a white board/gel board/magic screen/etc. a sketch etc. need less pressure and is motivating and rewarding.

Finally remember: all motor skills improve with hard work and practice and pupils with Down syndrome will need more practice than their typically developing peers, to process, consolidate and improve their skills. Encourage independence in daily living skills, such as dressing and feeding, as early as possible and do not over-support. In addition, as strong visual learners, demonstration and visual instructions and strategies will tend to work much better than verbal instructions.

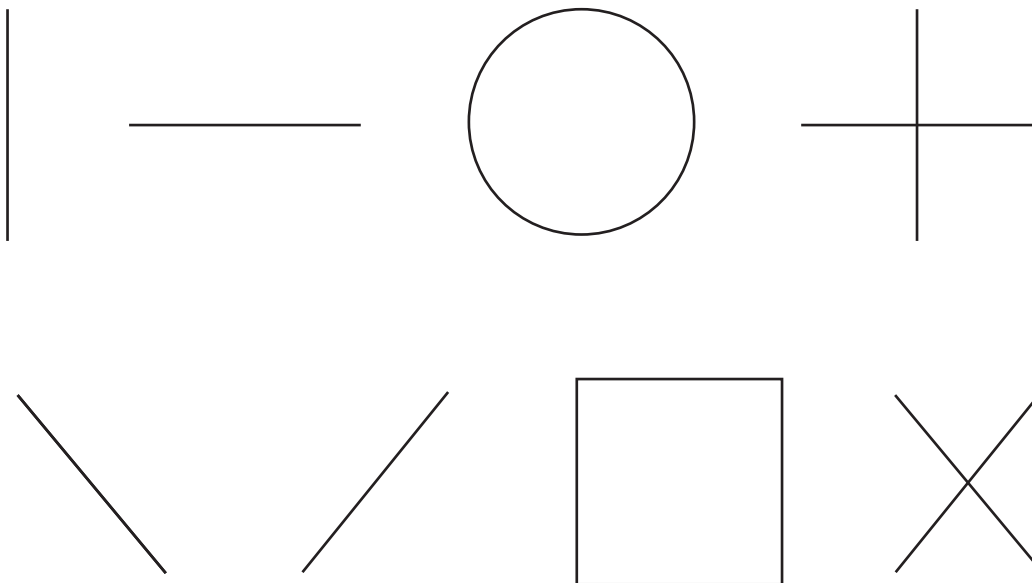
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c) Letter formation

Learning to form letters independently can be a slow process for many children with Down syndrome. Some children with Down syndrome may be more reluctant to practice. They may also be aware that their progress is slower than that of their peers. It is important however that they are given regular and additional opportunities to practice a range of multi-sensory, visual and perceptual motor activities to develop their pre writing skills and boost their confidence and self esteem in this area before attempting letter formation.

In addition, ensure your child understands “up” and “down” and “round” and can draw a range of different marks on paper – Beery (1989) and Maeland (1992) found that being able to copy eight shapes was significant in the child being able to write. These are:

- Horizontal line.
- Vertical line.
- Circle.
- Right angled cross.
- Diagonal lines.
- Square.
- Diagonal cross.



They should also have enough spatial awareness to attempt to draw a stick figure – however immature, with head, body, legs and arms and be able to trace or draw over letters with confidence.

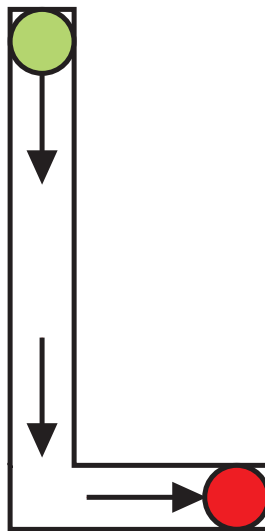
Many children learn to trace over letters well but some then have considerable difficulty transferring this skill to forming letters independently especially if allowed to trace over

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letters for a long period. It is important therefore to encourage them when ready, to move to independent writing as quickly as possible, even if this is only learning to write a few words from their sight vocabulary such as family names.

To increase learning experiences and keep the pupil motivated, use a wide range of multisensory activities and materials as alternatives to pencil and paper:

- Make letters with play dough. (Initially, make the letter on top of a large printed letter).
- Practice letter shapes using shaving foam, gloop, sand, finger paint and sand paper.
- Draw the shape of a letter/number in the air and / or on their backs before writing it on paper.
- Chalk on play ground.
- Shine a torch on a wall.
- Offer large plastic letters such as Rol'nWrite where a small ball is placed on the starting point of the plastic letter – as indicated by the arrow – which then rolls along the groove, tracking the correct formation. Children can run their finger along the groove in imitation.
- Offer different types and thickness of writing implements.
- Try pencil grips or chunky triangular pencils.
- When writing over/in between letters – keep work large.
- Encourage the child to draw in between the outlines of large printed letters.
- Trace over or write on top of the letters using a different coloured pencil or crayon.
- Indicate with a green and red dot on each letter where to start and stop.



- Teach child to write short, familiar words from their sight vocabulary.
- Offer a flashcard from which they can copy until they remember to spell the word(s) independently.
- Complete a dot to dot version of the word (Jardotty is a helpful resource available from Jarman handwriting).
- Provide widely spaced lines to allow for the child's larger printing.
- Ensure the lines are bold and dark to help with visual focusing and orientation.
- Squares on paper – the child writes each letter in a box – the boxes help with consistency of letter size, writing horizontally and word spacing. The size of the squares can be reduced over time and gradually phased out as skills develop.

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March 01

Robert has started to write on squared paper to help develop his handwriting and encourage him to leave spaces between words. Robert insists on 'marking' his spaces at present - by drawing a line. We will work on this (small steps) and gradually introduce smaller squares for him to write on.

FROM HANNA'S SURPRISE 21/3/01

W o r L e t @ C - 3 m - f r u t
 t o - b r o n w h . w i l - s h e
 i p e - t h e - m L - e r n - B y
 t h e - d o g ? w L S h e - L P R
 t h e - a p L - e t h - B y - y
 H o r s ? n w - s h e - L p t e s
 t h e - g r a p s - h o t - d h - B y
 t h e - g o t ?

that is wonderful Robert
well done.

- Garden writing – a visual activity using 3 coloured lines, representing the sky, grass and soil to help children understand instructions for positioning and forming letters. See www.speechteach.co.uk.



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- Teach upper and lower letters simultaneously.
- Graded pre-writing activity sheets.
- Developmental/multi-sensory handwriting programmes such as Write from the Start, Speed Up, (LDA).
- Consider cursive (joined-up) writing. The child does not see each letter as an individual unit but as part of a whole and writing becomes more fluent.
- Try to encourage the child to take part in writing activities with the rest of the class but at their own level. Let them produce a mark or scribble on the top of their pictures to represent their name and the date and to imitate “writing” in whatever way they choose. This will be typical of a much younger child.

d) Writing phrases

Writing is a highly complex task including many skills in addition to hand-eye co-ordination, and is a result of motor, sensory, perceptual and cognitive processes working together.

In addition to fine motor delay, children with Down syndrome have a smaller vocabulary, have difficulties putting words together to sequence a sentence correctly, and more problems retaining that information for long enough to write it down.

Particular areas of difficulty are:

- Sequencing thoughts, events and information into the correct order.
- Sequencing words into grammatically correct sentences.
- Retaining information in order to write it down.
- Remembering how to spell word/or applying phonics.
- Taking notes and dictation.
- Completing lengthy written tasks.
- Copying text from the blackboard.

Visual cues and prompts and alternative means of recording are therefore essential to trigger language, sentence structure and memory as is ensuring pupils are asked to write about topics within their experience and understanding.

Encourage independent writing as much as possible rather than the pupil spending a long time copying words from a scribe, over writing or under writing. Encourage writing for a purpose e.g. writing a simple note or card, writing a simple handmade book for a younger child.

Children with DS will continue to need a high level of support to do this but it can often be far more valuable for the pupil to write one sentence with a high level of independence rather than write reams of simple copying.

Alternative methods of recording:

- Provide pictures for the pupil to sequence and paste.
- Provide words and sentences for the pupil to sequence and match to the pictures.
- Provide worksheets where the pupil underlines or rings the correct answer.
- Provide cloze procedure – provision of a short phrase with blank spaces. The child has to choose from a given bank of words which word to insert into the space.

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Cloze procedure

Transport

I ----- to school.
Dad drives his ----- to work.
Mum rides her ----- to work.
I went to America on a -----.
I went to London on a -----.
I like riding my ----- in the park.


Train walk bike plane car bus

The Prince and the Princess

We have read a story about Gelert and the wolf. We are going to write about the prince and the Princess.

Write sentences to describe the Prince and the Princess. Choose the correct words to use in your sentence.


The Prince



weak brave tall
strong small shy
gentle kind
handsome ugly

The prince was _____ and _____
He had a _____ face.

The Princess



smile brown
long hair
unhappy beautiful
green happy eyes
golden
short blue ugly

The princess was _____ and _____
He had _____

To encourage more independence in the early stages of writing, provide the child with a words for writing folder. This consists of a folder with Velcro strips, to which flashcards of the words the child can read can be stuck. The child is given help to form a sentence and then picks the words needed and places them on to a sentence strip. Any new words which are needed can be written onto blank flashcards and added to the bank.



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e) Developing sentence structure

Help the pupil think of a short phrase to describe a picture. Write the phrase on to a sentence strip. Cut into separate words and ask the child to re sequence them. The child can stick the words in their book.

OR – if able, can copy the words in to their book.

To develop independent spelling when copying the phrase, turn over the flash cards which the child CAN spell but leave in place so the child remembers a word is there.

Pupil decides a sentence they wish to write – with liaison with adult who writes it on sentence strip:



Words are cut up and spread out:



Words sequenced back into correct order by pupil independently:



Pupil helped to correct the sequence. Words which pupil can spell are turned over to encourage independent writing and spelling but remain in place to prompt memory. Words which pupil cannot spell are left in place. Pupil writes sentence in book:




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Alternatively, the TA helps the pupil to think of a sentence. TA writes the sentence on a white board asking pupil to help spell familiar words and help with new ones. The pupil copies this in their book independently or types up on a computer.

Friday 17th October
Wno a m n

Yr 5




I am Zoe's sister.
Mummy, Daddy, Zoe and
me are a family.
I am kind because
I made
a get well card
for Great-Grandma

★ Amy told her TA (with prompting) what she wanted to say. Her TA wrote the sentence on a whiteboard. Amy helped with spellings. Amy was left alone to copy sentences from board into her book to encourage independence and confidence.

10.6.00

Yr 6

Things we
Like



I like my dog.

I like cats.

I love my mum.

Amy and Leanne like
to play

Amy likes to play
with my doll

✓ lovely sentences written
on your own

These sentences were written independently. I said the sentence to Leanne and she wrote it down. I repeated the sentence where necessary.

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To encourage independence, provide a picture and ask pupil to write a short phrase without adult help – assess their progress over the term.



1.12.08

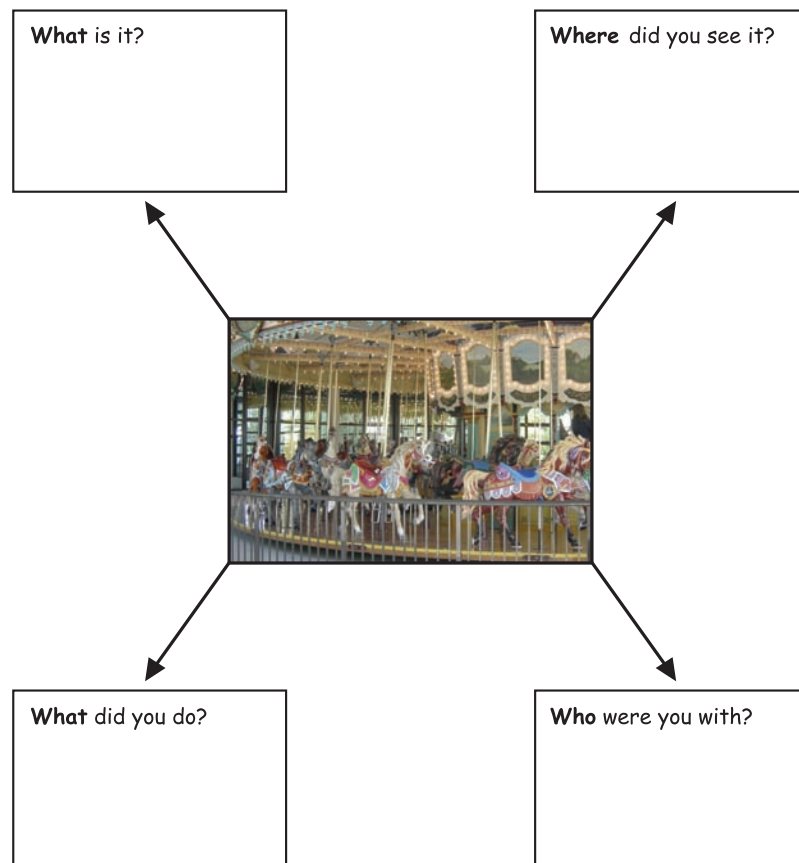
I Like Coctart.
I Live Chocolate.

The Coctart tags
The Chocolate is tasty.

The Chocolate 12
There are 12 Chocolates.

✓ Brilliant.
Well done.

Provide mind maps, story boards and writing frames.



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Set up a conversation diary – TA or another pupil, and pupil with Down syndrome take turns to say/write phrases, mimicking a conversation.



Make use of computer with specialist software such as Clicker which uses whole words. Personalised grids can be made where words are inserted into cells. The pupil clicks on the words to make a sentence – excellent to develop sequencing.

Copying from the board – often hard for pupils with Down syndrome who can lose their place or forget where they were etc:

- Highlight in a different colour, key sentences or words for the pupil with to copy.
- Provide a shortened summarised version of the text on to paper and place next to them.
- Provide lists of keywords, word banks, word and picture dictionaries at all times and for every ability level.

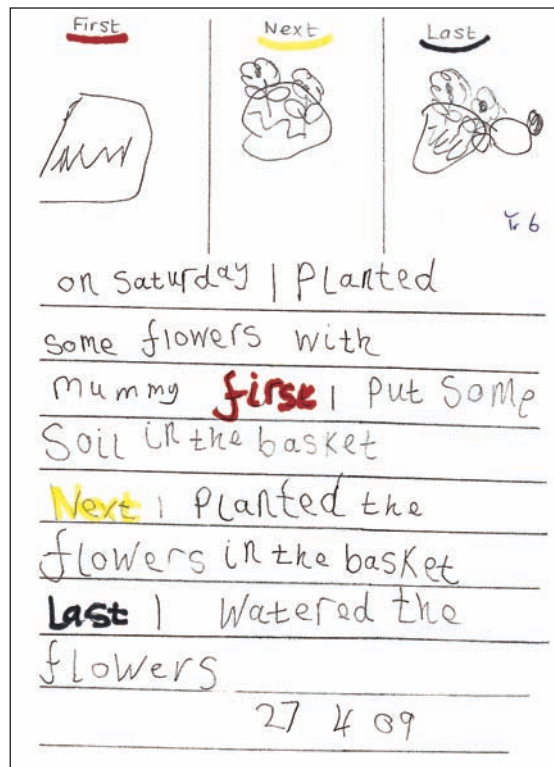
Extending writing

Difficulties with speech and language, limited vocabulary, general knowledge and imagination can limit the ability to extend writing further. Continuing difficulties with memory and retention of both vocabulary, sentence structure, information and ideas will also have an impact. Pupils can forget what they had planned, lose focus or go off on a tangent.

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Pupils with Down's syndrome therefore even when they have acquired a basic level of being able to write short phrases or sentences continue to need additional visual prompts to help them extend writing and develop their ability to plan and write simple stories.

- Link writing to personal events or experiences – this will help overcome difficulties with memory and focusing.
- Continue to provide pictures, words, mind maps etc as prompts, but increase the range and amount as the pupil's ability develops.
- Develop the sense of a beginning, middle and end – teach the words first, next and then.



f) Spelling

Many pupils with Down syndrome learn to spell words purely by relying on their good visual memory and learning the shape of the word. The use of phonics to develop spelling can be more difficult for many pupils with Down syndrome as it requires good hearing, fine discrimination of sounds and advanced problem solving skills. However pupils with DS can learn to apply phonic rules to differing degrees and should be encouraged to do so whilst taking into account the difficulties they may have. They should be included into the whole class letters and sounds activities as much as possible and given support to help access them.

Many pupils with Down syndrome love accessing multi-sensory programmes such as Jolly Phonics where the letter sound is taught alongside a sign and a picture and often do extremely well. They can have however, as with reading, more difficulty transferring this letter sound knowledge to help with their spelling.

- Target words to learn to spell which the pupil can already read. Not all of the high frequency words may be appropriate for the pupil to learn as these may not be familiar or used by them in their speech just yet.

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- Teach spellings as visually as possible and use multi-sensory methods.
- Finger tracing over sandpaper letters.
- Use plastic letter, letter cards etc.
- Use Look, Say, Cover, Write, Check strategy – if the pupil has difficulty writing – use plastic letters for them sequence.
- Access simple spelling computer programmes – Clicker, Wordshark, First Keys 2.
- Colour code similar letter groups or patterns within words. Onset and rime is a particular useful strategy for pupils with Down syndrome.
- As pupil's reading improves, they will begin to associate sounds with letter strings and patterns. Draw the pupil's attention to strings such as 'ing' or 'tion' as they are reading.
- Finger spelling may help some pupils remember letter names and letter patterns. Learning to finger spell can be an enjoyable game for a group of children to play together.
- Check educational suppliers for good visual teaching materials e.g. 'vowel and blend snap', 'ten minutes a day' or 'wordspell'.
- Build a word bank using index cards in a box. Group words under headings e.g. people, animals, school, home, or arrange them alphabetically but colour code them with pictures representing the categories at the front of the box.
- Provide 3 or 4 spellings a week to learn and test at the end of the week.

g) Useful reading

Alton, S. (2001) **Children with Down's syndrome – Reading Information sheet.** Down's Syndrome Association.

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h) Further reading and acknowledgments

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Berger, A. & Gross, J. (2000) **Teaching the Literacy Hour in the Inclusive Classroom.** David Fulton Publishers.

Bird, G., Beadman, J. & Buckley, S. (2000) **Reading and writing development for children with Down syndrome.** Down Syndrome.

Issues & Information. DownsEd.

Unit 6:

i) Literacy resources

DownsEd

Sarah Duffen Centre
Belmont St.
Southsea
Portsmouth
Hants. PO5 1NA
Tel: 023 9285 5330

LDA

Duke St.
Wisbech
Cambs. PE13 2AE
Tel: 01945 463441

Taskmaster

Morris Rd.
Leicester. LE2 6BR
Tel: 0116 2704286

Winslow Press

Telford Rd.
Bicester
Oxon. OX6 0TS
Tel: 01869 244644

Ack beery 1989 Maeland 1992.

Handi Writer from Taskmaster is a unique device to help pupils hold their pencils in a pincer grip, using a wrist band and a token to hold (either a football or a dolphin) – it keeps the child's hand in a pincer position and holds the pencil if the pupil releases the grip. A lot of success reported from pupils who have used it.

Gelboard – uses a magnetic stylus as a pen so that pupils can write/draw/make patterns onto a small pupil sized gel board. To reuse simply shake the board and start again. Good fun writing practice! TTS group 0800318686.

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