

Down's Syndrome Scotland

Making It Work



Supporting Inclusion in Secondary Schools

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Introduction

The purpose of this training pack is to provide a level of training that will address many aspects and issues surrounding successful secondary inclusion, will promote a proactive approach to promoting and sustaining inclusive practices in mainstream secondary schools. It is intended that the materials will be used by schools and local education authorities to provide in-service training before and throughout the secondary education of students with significant learning disabilities.

The objectives of the pack are:

- ⌚ To raise awareness that students with learning disabilities **belong** to their mainstream school, are there by right and are recognised by themselves and others as valued members of the school and the community.
- ⌚ To encourage staff, parents and other professionals to recognise the key contributory factors towards successful inclusion are:
 - a. A willingness to make it work,
 - b. A positive attitude and
 - c. A flexible approach
- ⌚ To influence the attitude of those involved and lead them to fully accept that meaningful inclusion will require significant changes to the status quo i.e. existing practices.
- ⌚ To stress the need for planning and joint working practices that will enable the transition from primary to secondary education.
- ⌚ To promote the provision of appropriate support by means of economic management of support hours and the deployment of staff, i.e. teachers and SEN assistants/auxiliaries.
- ⌚ To encourage differentiation of the curriculum and teaching styles.

Section 1

Transition from Primary to Secondary School

Transition From Primary to Secondary

OHP01

The essential elements of a successful transition

1. A positive attitude from receiving school.
2. Collaboration between primary and secondary schools.
3. A carefully prepared transition programme.

Successful Transition

Essential Elements

A positive attitude from receiving school

Collaboration between primary & secondary

Carefully prepared transition plan

START EARLY

OHP02

Planning the Transition

Preparation of the programme should start early at the formal review in P7 which should be held no later than February of that year. All parties involved with student should be invited, ideally, the student, parent/carer, the primary school Head Teacher and Class Teacher, Learning Support Assistant/s and Learning Support Coordinator, the secondary school Principal Teacher of Learning Support, Guidance teacher, Education Psychologist, Speech and Language Therapist and any other involved professionals. Additionally, arrange a final informal review towards the end of term preceded by opportunities for secondary PT Learning Support, Guidance teacher and Learning Support Assistant to spend time observing the student in the primary.

Planning the Transition

Final year formal review no later than February

Include:

Primary - Class teacher, LSA and Learning Support Coordinator

Secondary - PT Learning Support & staff, Guidance teachers

Parents and involved professionals

In order to sustain a continuum of learning it is vital to transfer Primary school targets to Secondary school particularly in literacy and numeracy and continue to build upon these. Many students may be working at levels from 'A' onwards therefore it is essential that all lessons in all areas of the curriculum are adapted to meet these levels of attainment.

OHPT03

Planning the Transition

The type and use of support should be individually worked out, i.e. Support Assistants usual allocation of 25 hours should be planned to provide a minimum of one to one tutoring where the Learning Support Assistant is always next to or velcroed to the student. This model provides the student with a personal secretary and discourages motivation, independence and lowers self-esteem. In large secondary schools there is likely to be more than one Learning Support Assistant. Ideally having more than one is more beneficial as it will encourage less possessive attitudes and foster independence.

However, too many may create difficulty in consistency of management. If setting is provided in certain subjects placing the student with the more motivated peers will encourage better learning and behaviour patterns.

At transfer to secondary school achievement levels may be at the level of working towards or having achieved level A. Skills will continue to develop, with some pupils working around level B (average for children aged 9 years) at S4. By the end of P7 many will be beginning to understand money, times, division. In numeracy and literacy transfer targets from primary education to secondary and bear in mind that it is common for literacy attainments to be higher than numeracy.

Identify training needs and plan training days and specialist help. All teaching and auxiliary staff will need to acquire a sound knowledge of the

Planning the Transition

Learning Support & Guidance staff and LSA:

Observe pupil in formal and informal settings

Attend final review end of primary year

Transfer Primary targets to Secondary

Plan management of support hours

Identify necessary training

Learning Support Department

Accessible

Friendly

Open to all students

Diverse

characteristics of a particular learning disability and the best teaching and management strategies in order to confidently work with students with significant learning difficulties. Learning support departments should plan to be friendly and accessible to both students with and without learning difficulties encouraging students of all abilities to work and spend leisure time together. In other words it should be open to all students. The activities that are provided should be wide and varied to encourage casual relationships between a diversity of groups of students.

OHPT04

Monitoring the Transition

Set up regular meetings with both primary and secondary staff to discuss progress of transition plan. Plan the development of home - school partnership & communication. Identify training needs. In many cases the inclusion of students with significant learning difficulties will be a new and perhaps daunting undertaking. Training therefore is vital. Identify training issues and needs.

Monitoring the Transition

Set up regular meetings between:

- Primary staff & LSAs
- Secondary staff & LSAs
- Student
- Parents
- Other professionals (if necessary)

Discuss progress of transition plan

- Plan development of home – school Partnership
- Communication

OHPT05

Preparing the pupil for Secondary School.

Plan to have peers from primary class accompany pupil. Visits should include more informal times of day: e.g. breaks, lunch, and assembly.

Practise lunch procedure. Help pupil learn routine of day in advance, e.g. provide a clear, visual timetable. Help pupil learn layout of school: dining room, hall, toilets, main classroom, library, learning support base etc. Provide pupil and parents with map of school. Practise procedures such as lunch time, moving from class to class from different starting points and the route from home to school.

Preparing for Secondary

Plan additional visits

Plan to have peers from Primary class accompany student

Visits to include more informal times of day:
breaks, lunch, assembly

Practise lunch procedure.

Help student learn routine of day in advance, e.g. clear, visual timetable.

Using timetables is usually straightforward. Most students adapt well and will benefit from being provided with a clear plan of the school ideally colour coded, showing subject areas and key staff names. Visual symbols can be included for each lesson or subjects can be colour coded to match school plan. Folders for each subject and colour coded to match timetable will help student organise required materials and books for each day.

Provide homework timetables as it is difficult for students to remember appropriate days for submitting work. Homework should be realistic in terms of amount, the degree of written work and matched to the student's ability. It should be planned in advance and aim to reinforce the key points.

Change of location for lessons may be challenging. Encourage independence by allowing the student to mix with peers and develop friendships, during class and the less formal lunch time and breaks. As independence may be slow to build, encourage familiar and supportive peers to take responsibility for the student in each subject class.

OHPT06

Partnership and Communication

Pupils with DS can take longer to adjust to new environment & learn new rules/routines. It is therefore vital to set up good channels of communication. Discuss joint strategies concerning behaviour and discipline. Set clear guidelines for procedures re. problems and identify a main contact person, who will register concerns, procedures to be carried out. Provide a safe-base for pupil to go to, e.g. learning resource room, learning support base. Insist upon consistency from everyone: staff, student, parents and peers regarding the procedures for homework or problems and identify a main contact person, who will register concerns and the measures and strategies to be employed.

Partnerships & Communication

Students with DS may take longer to:

- Adjust to new environment
- Learn new rules & routines

Discuss joint strategies

- Behaviour
- Discipline
- Homework

Establish

- A main contact person
- Who will register concerns
- Procedures to be carried out
- Safe-base for student to go to:
 - Learning resource room/base
- Consistency from:
 - Staff, student, peers, parents

OHPT07

Communication Channels

The provision of a home-school communication book or diary is essential to forming good partnerships between home and school. However, it needs more than a message and should not be used for the relaying of bad news. It is useful for:

1. Giving advance warning of any changes in school routine.
2. Inviting parents to termly reviews.
3. Providing lists of equipment for different days.
4. Informing parents about particular topics.
5. Giving short explanations linking with specific lessons.
6. Adding key words, symbols or diagrams to help pupil & parents.
7. Explaining how they can help prepare the student by:
 - a. Finding back up material.
 - b. Reinforcing teaching points.

Channels of Communication

Communication book/folder

Establish:

Who writes in it - more than one person.
What is written
Why it is used

Messages to & from school

Invite parents to reviews and regular meetings
Give advance warning re. changes in the school routine

Involving parent in the education

Inform parents about particular topics
Parents can prepare child i.e. find back up resources
Lists of equipment for different days.
Short explanations, linking to lessons.
Give key words, symbols or diagrams to help pupil & parents.

Enabling Home - School partnership:

1. Nominate a key worker, e.g. guidance teacher, who builds links between home and school and encourages parental involvement.
2. Meet with parents on a regular basis.
3. Listen to parental concerns and acknowledge them.
4. Involve parents in their child's educational programme.
5. Inform parents about visits from professionals.
6. Provide written reports before the annual review.
7. Consult parents before changing provision.
8. Celebrate with parents when progress is being made.
9. Trust parents to cooperate when there are problems.
10. Value parents as partners in the education of their child.

OHPT08

Social Inclusion

In general, students with Down's syndrome do not initiate conversations easily although this skill appears to improve throughout the teenage years. It is important in secondary schools to help students to develop friendships & social skills, (see section 2 - 'Supporting Independence & Building Friendships'). Build the student's self esteem by giving responsibilities and duties that are real and worthwhile. Social skills taught should be those which prepare the student for life in the community after leaving school.

Social Inclusion

It is highly important in Secondary to:

- Develop friendships & social skills
- Build self esteem & self image
- Prepare for leaving school

Provide:

Lunchtime clubs/activities for students with and without Learning Difficulties

Friendship Rotas/Buddy Schemes/Circle of Friends - Support on hand if necessary

Raise awareness of learning disabilities during whole class, year group or whole school assemblies

Provide appropriate lunchtime clubs and activities for students with and without learning difficulties. Create friendship rotas, Buddy Schemes, 'Circles of Friends' where support is on hand only if necessary.

Raise awareness of disabilities and needs of each individual during whole-school/class/year group assemblies, meetings and 'Circle Time'. All provision for social inclusion should feature as an integral part of the student's Individualised Education Plan.

Secondary education is better suited for children because of well developed learning support and pupils benefit from working with a wide range of specialist teachers. There are also more opportunities to learn social and life skills in a real environment.

Recommended Reading

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Section 2

Supporting Independence and Building Friendships

Supporting Independence and Building Friendships

OHPS01

Why Inclusion?

Belonging i.e. recognised by peers and self as an important member of the school and the community. Living and learning within the community is a basic human right not a gratefully received privilege. The benefits of inclusive education are not exclusive to students with particular disabilities.

Essentially, inclusion promotes better tolerance, patience and understanding of disabilities and helps to eliminate prejudice

in society as a whole. Instead of being competitive peers become more supportive of others and learn to appreciate diversity and accept that everyone's contribution is of value and is important to the life of the school. Full rather than part-time participation in classes encourages peers and staff to value the student as a member of the class who will be missed when not there.

Why Inclusion?

Knowing you belong

Being there by right

Being missed when you are not there

OHPS02

Aims of Inclusion

Individuals with significant disabilities have:

- ⌚ A valued role in society.
- ⌚ A worthwhile life.
- ⌚ An independent life with appropriate support.

Aims of Inclusion

A valued role in the society

A worthwhile life

Independent living with appropriate support

Research has shown that primary and secondary aged pupils in the mainstream do at least as well, if not better, in literacy and numeracy than their corresponding peers educated in special schools.

OHPS03

Objectives of Inclusion

That students will:

- ⌚ Acquire new skills.
- ⌚ Develop age appropriate behaviour.
- ⌚ Develop independent learning behaviour.
- ⌚ Develop friendships in the community.

Inclusive education benefits not only the child with Down's syndrome but also leads to greater understanding and less prejudice in the community and ultimately in society at large. Other children learn to become more tolerant and patient and to support others rather than competing. They also learn to value diversity and appreciate that everyone has a valuable contribution to bring to the life of the school.

Objectives of Inclusion

Student will:

Acquire new skills

Develop age appropriate behaviour

Develop independent learning behaviour

Develop friendships in the community

OHPS04

Successful Inclusion

The key factors that lead to a successful inclusive placement in mainstream schools are firstly, a positive attitude of the school and a commitment to making it work on behalf of parents. In schools where there is a willingness to make it work difficulties are viewed as challenges that can develop teaching skills and not as obstacles preventing inclusion. Secondly, although every teacher can

successfully teach a child with significant learning disabilities they do require additional training and support together with an extra pair of hands in the classroom. It is essential that training is provided for staff at all levels within the school. Learning support assistants need training both in the needs of children with particular disabilities and in the methods of providing effective support. Recent research has shown that

Successful Inclusion

Key factors

Attitude of the school & LEA

Support & training for staff

Behaviour of the student

Ability of the student

24% of assistants supporting children with Down's syndrome in Key Stage 1, (Pr.1-3) and 32% in Key Stage 2, (Pr 4-7), have received no training of any sort. Lorenz, S. (1999). The third critical factor, in the inclusion of any student in a mainstream school regardless of any disability is his/her behaviour. Finally, the least likely to make a placement break down is the ability of the child. With sufficient adaptation of the curriculum and teaching methods all students can access the curriculum.

OHPS05

Planning Social Independence

Essentially, educators must be willing to adopt different views regarding what constitutes education and achievement. Breaking inherited practices and accepting the diversity in abilities as challenges will provide the opportunity to develop new teaching methods and skills, rather than viewing the challenges as unsurmountable obstacles to be overcome.

Planning Social Independence

Jointly planned approach

- Adopt new principles and methods
- Break inherited practices
- Recognise the student's needs
- Set targets in small carefully graded steps

When planning support, the needs of each individual student should be identified and long-term targets analysed and broken down into carefully graded steps. This in turn will identify the short-term targets. Successful schools address the learning and emotional needs of the child and plan programmes that promote age appropriate behaviours and enable students to develop new academic and social skills.

OHPS06

Managing Support Assistants

A single support assistant may not promote independent learning and social skills as the student may identify he/she as their personal helper. Develop flexible working with a range of adults to discourage over familiarity and over dependence. Ideally creating subject specific support assistants reduces the need for one person to cover all subject areas. A narrower range of subjects allows the assistant to gain more knowledge of specific subjects making differentiation easier.

Additionally, liaison between support assistants and teaching staff will facilitate planning for differentiation. The best role of an assistant is to work as part of departmental team, planning work with the subject teacher and being clear about their respective roles and responsibilities. Support can then be provided flexibly to all students.

Managing Support

Support Assistants

Single SA may not promote independent:

- Learning skills
- Social skills

Subject specific LSAs

- More able to cope with narrower range of subjects
- More knowledge of specific subjects: easier to differentiate
- Better liaison between teachers/SA to plan differentiation

Develops flexible working with a range of adults

Discourages over-dependence and over-familiarity

OHPS07

Support Assistants

The Bridge Builder facilitates access to the curriculum. Promotes independence, builds social skills, friendships, confidence and encourages age appropriate behaviour.

Full time support prevents the child becoming independent. It interferes with the development of friendships and acts as a barrier between the child and the class teacher who is ultimately responsible for the child's learning.

Support Assistants

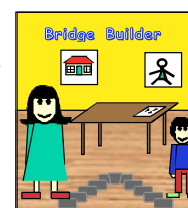
Velcro assistant isolates the student and prevents social interaction and independent working.



Helicopter assistant prevents independent working and problem solving by the student



Bridge builder facilitates access to the curriculum, promotes independence, social interaction, confidence and age appropriate behaviour.



OHPS08

Managing Support Time

Ideally, minimum time should be allocated to one to one teaching and maximum time given over to whole class activities, group work, peer support and unsupported sessions where the LSA is an additional pair of hands in the classroom.

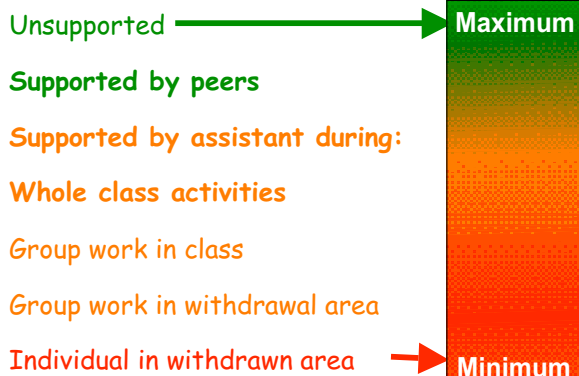
When less time is spent on one-to-one tutoring it frees the LSA to spend time planning and differentiating work for the students. The more the work is differentiated the more independent the student becomes. As the student's independent working increases yet more time is available for differentiation.

Managing Support Time

Key points

Create opportunities for independent learning in whole class activities.

Target periods during each day when student is to be:



OHPS09

Developing Social Independence

Give students opportunities and time to make mistakes. Getting it right all of the time teaches the student that being correct is the only acceptable response. Develop investigative skills by teaching that 'getting it wrong' is O.K. and that the way to solve problems is to investigate, test and try alternative strategies until a reasonable result is obtained.

Avoid over attending to the student as this leads to over dependence and learned helplessness. The student believes that they cannot undertake tasks without adult assistance. Build confidence and self-esteem by giving responsibilities in the classroom.

Developing Social Independence

Give students opportunities and time to:

- Make mistakes

- Solve problems

Avoid over attending to the student

Give responsibilities in the classroom

Teach hierarchy of seeking help

Encourage asking for help from:

- Peers

- Support Assistant

- Class teacher

Setting Targets

Setting Targets

- Allow the student to:
 - Set his own targets
 - Monitor her own progress
 - Give his own awards

OHPS11

Rewards

Self praise

Facilitating Friendships

Plan time for opportunities to work without close adult supervision. Encourage other students to befriend and support the student. Include him/her in the whole range of school activities. Give responsibilities to other students and trust them. Do not be afraid to take risks as over protection inhibits independence.

OHPS12

Friendships and Age Appropriate Behaviour

Opportunities to mix socially with typically developing peers will provide situations in which students can develop friendships and feelings. At the same time, learning and playing alongside typically developing peers in a mainstream environment gives children the role models they will need to encourage the development of age-appropriate behaviour.

Students may not learn well from incidental learning and therefore may be slower to pick things up, learn the rules of social relationships and develop appropriate behaviour patterns. Lack of language skills may interfere with the student's ability to initiate play, join in games, initiate conversation and form friendships. Additional problems may result as a consequence of not fully understanding the feelings of others.

Friendships & Age Appropriate Behaviour

Mixing with typically developing peers

Provides ideal opportunities to:

- Develop friendships
- Learn age - appropriate behaviour.

May need additional help and support to develop these skills.

May not learn well from incidental learning

May be slower to:

- Pick things up
- Learn the rules of social relations
- Learn appropriate behaviour

May have insufficient language skills to:

- Initiate play
- Initiate conversation
- Form friendships

May not fully understand feelings

OHPS13

Age Appropriate Behaviour

Although cognitive and language developmental may be slower than typically developing peers, students should be treated according to their chronological age. Consequently, the rules, routines and behaviour expected of peers should also apply to students with Down's syndrome or other significant disabilities. Including the students in a wide range of school activities will provide opportunities for learning appropriate behaviour patterns, how to work co-operatively and how to participate and respond appropriately.

Age Appropriate Behaviour

Plan time for opportunities to:

- Remove close adult supervision
- Encourage other students to befriend and support
- Include student in whole range of school activities
- Learn appropriate behaviour patterns
- Practise following rules & routines
- Participate and respond appropriately
- Work cooperatively

Trust other students and take risks

OHPS14

Social Interaction

Playing games provides opportunities for social interaction with peers. Games ideally should include more than two people thus avoiding one-to-one situations. Important social skills are practised in a natural and fun environment. Students learn the importance of rules and keeping to them. They learn to share, take turns, lose with good grace and congratulate the winner. In other words they learn the etiquette of gamesmanship. Other play situations teach giving and taking and playing well imaginatively.

Social Interaction

Learning how to:

- Play games
 - Sharing
 - Take turns
 - Lose with good grace
- Give and take
- Play well imaginatively
- Form friendships:
 - Social interaction
 - Learning the 'Dos & Don'ts'
- Understand feelings
 - Empathy
 - Care about others

OHPS15

Practical Strategies

Encourage cooperative learning by including students in mixed ability groups. Avoid placement in lower ability groups as peers may provide poor role models by exhibiting inappropriate behaviour. They may be less understanding and may use the student as a distraction by 'setting them up'. Build relationships by encouraging peer tutoring and low level support from older and/or more developmentally mature students on a rota system whereby volunteers can earn reward points.

Practical Strategies

Encourage cooperative learning in:

- Mixed ability groups
- Avoid placements in lower ability groups

Encourage working with more able peers when:

- Tasks are suitably differentiated
- Undertaking practical activities

Provide peer support during:

- Change over times, break lunchtime
- Class activities and tasks

Create:

- Friendship rota
- 'Circle of friends'
- 'Buddy system'

Since students with Down's syndrome learn mostly by imitation placing students with higher ability groups is more likely to promote good learning skills and acceptable behaviour patterns. Encourage working with more able peers when tasks are suitably differentiated and undertaking practical activities. Provide peer support during change over times, breaks and lunch times and class activities and tasks. 'Circle Time' can be an invaluable tool for promoting support within the class. Smaller groups of peers can be formed into rota based 'Circle of Friends' or Buddy systems.

Unstructured and social sessions e.g. assembly, library practical subjects where the opportunity to work cooperatively as a team should never be used for specialised work. Children with learning difficulties need maximum time and opportunity to socialise and make friends.

Provide supported clubs and group activities such as lunchtime, after school and homework clubs. Structure or support during breaks by providing games to encourage interaction with peers.

Raise awareness of disabilities by holding whole school/class/staff team class talks on aspects and issues relating to specific disabilities. Additional focus can be introduced during 'Circle Time'.

Use drama, role-play, 'Circle Time', etc. to develop feelings and the concepts of 'good friends' and 'considering others'. Develop social skills by building self-awareness, self-identity, self esteem, confidence, behaviour rules and expectations and reinforce visually.

Students with significant disabilities may not seem to develop true friendships with typically developing peers. However, these friendships must not be underestimated. Although maturity and interests are diverse, it is possible for students to learn to accept this diversity, trust each other, and work and play together.

Recommended reading

Balshaw, M. (1999) Help in the Classroom (2nd edition)' David Fulton Publishers.

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Section 3

Accessing the Secondary Curriculum

Differentiation

In order to include students with significant learning difficulties in mainstream secondary schools, policies, approaches and attitudes must be reconsidered and adapted. Essentially, educators must be willing to adopt different views regarding what constitutes education and achievement. Some children may easily achieve a certain level of attainment where for others the same attainment may be a major step in learning and an achievement worthy of recognition and celebration.

OHP D01

Differentiation

All lessons can be accessed when adequate differentiation, clear visual resources and support are provided for each individual. In large secondary schools there may be other students working at similar levels who will benefit from adapted resources, principles and practices.

Differentiation allows students to work more independently thus reducing the need for one to one adult intervention. Consequently, more time is available for preparation and planning the adaptation of activities, tasks, worksheets, etc.

Students provided with a differentiated curriculum experience less stress and frustration and are less likely to display difficult behaviour. Differentiation fosters success, a sense of achievement, builds self-esteem and encourages self-motivation.

Differentiation

Reconsider and adapt:

- Policies
- Approaches
- Attitudes

Adopt different views on what constitutes:

- Education
- Achievement

All lessons can be accessed with:

- Adequate differentiation**
- Clear visual resources
- Appropriate support



OHPD02

Pupil Centred Differentiation

To differentiate effectively a sound knowledge of the individual student together with a basic knowledge of the particular disability is essential.

Differentiation must therefore be pupil-centred and is dependent upon support being detailed and carefully planned, collaborative working between subject teachers, learning support assistants, student and parents, effective classroom management and finally, modified and adapted:

- ⌚ Curriculum.
- ⌚ Teaching styles.
- ⌚ Instruction.
- ⌚ Activities.
- ⌚ Tasks.
- ⌚ Methods of response.
- ⌚ Criteria for success.
- ⌚ Evaluation and assessment.

OHP D03

Supporting Differentiation

Ideally, minimum time should be devoted to one to one teaching and maximum time given over to whole class activities, group work, peer support and unsupported sessions where the Learning Support Assistant is an additional pair of hands in the classroom.

Differentiation

- ⌚ Basic knowledge and information about DS
- ⌚ Detailed planning for support
- ⌚ Effective classroom management
- ⌚ Modified and adapted:
 - Curriculum
 - Teaching styles
 - Instruction
 - Activities
 - Tasks
 - Methods of response
 - Criteria for success
 - Evaluation & assessment

DIFFERENTIATION MUST BE CHILD-CENTRED

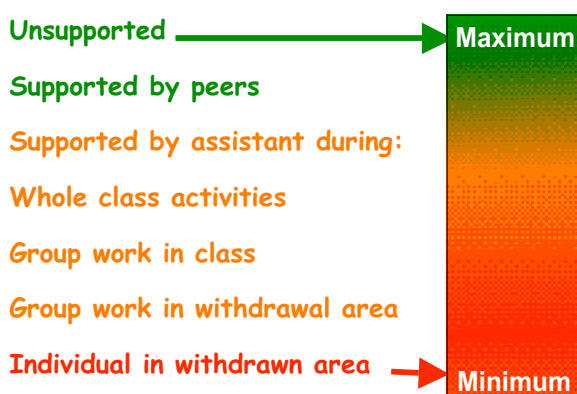


Supporting Differentiation

Key points

Create opportunities for independent learning in whole class activities.

Target periods during each day when student is to be:



OHP D04

Communication and Collaboration

Good classroom management, well-structured lessons and access to resources make most lessons possible. Plan meeting times between subject teachers, learning support department, support assistants and any other relevant professionals. At the outset of specific blocks of teaching, outline the content, aims and objectives. Identify the main points, targets, and the success criteria and provide the support assistant with brief and simple lesson plans in advance. Establish feedback opportunities where key points can be summarised and reviewed. This will enable staff to measure success and provide the information needed for next steps in the curriculum.

Communication & Collaboration

Plan meeting times between:

- Subject teachers
- Learning support department
- Support Assistants

Outline content and aims at beginning

- L.S.A. has brief, simple lesson plans in advance
- Main points, targets and success criteria
- Prepare well structured lessons

Establish feedback opportunities

Summary of key points and review at end

Access to resources makes most lessons possible

OHPD05

Curriculum

The curriculum should be relevant, based upon feasible curricular areas and learning outcomes that are functional and focussed upon skills for life. It should be dependent upon individual student's developmental stage rather than chronological age; strengths and weaknesses; the particular or special interests; what motivates; cognitive and physical skills and the level of receptive and expressive language; and communication and social skills.

Curriculum

Relevant

- ⌚ In terms of:
- ⌚ Feasible outcomes
- ⌚ Functional skills
- ⌚ Life skills

Dependent upon:

- ⌚ Developmental stages
- ⌚ Interests
- ⌚ Motivation
- ⌚ Cognitive skills
- ⌚ Physical skills
- ⌚ Language development
 - Receptive
 - Expressive
- ⌚ Communication skills
- ⌚ Social skills



Learning Profile

It is important to recognise that many pupils may not only be generally delayed but may like students with Down's syndrome, have a specific learning profile in which there are characteristic strengths and weaknesses. Discovering the unique profile of each child will identify the factors that facilitate and inhibit learning and provide a baseline for planning and implementing meaningful and relevant programmes of work.

Facilitating factors

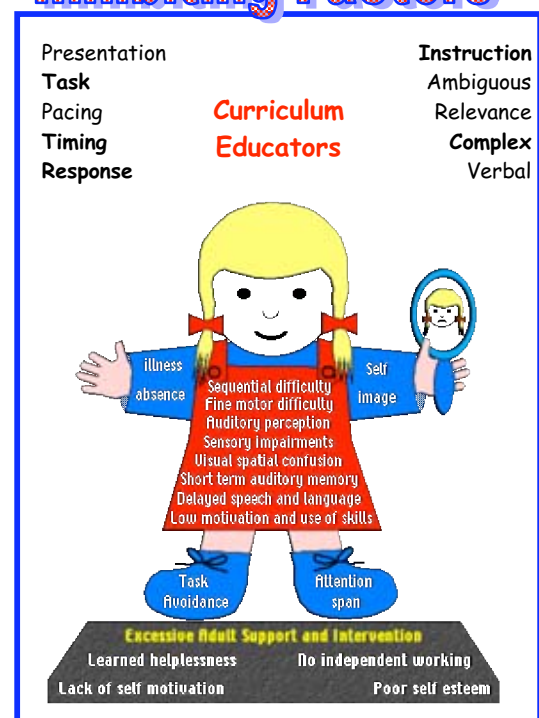
Many students with learning difficulties may have a strong visual awareness and good visual learning skills. There are students who have delayed language skills but have the ability to use sign, gesture and visual support. In some cases they may have the ability to learn and use the written word. In most cases students have the ability and desire to learn from their peers, in other words to imitate and take their cue from them.

OHPD06

Inhibiting factors

Although there are many characteristics that can be attributed to specific disabilities it is important to note that few students will experience all of them. These characteristics may have an effect upon the rate of educational progress and levels of achievement. However, it should be recognised that the main inhibiting factors are those that can be created, often inadvertently, by those responsible for the learning that takes place. Critical factors are; the way a lesson is presented and the quality of instruction given; the pacing and timing of lessons; the tasks themselves, their relevance to the student's interest, prior knowledge, ability and the level of difficulty i.e. being too easy or too difficult; the use of complex or ambiguous language when giving instruction and its relevance to the task; the amount of verbal instruction as opposed to demonstration; over support creating learned helplessness, over dependence, low self-esteem or low self-motivation.

Inhibiting Factors



OHP D07

Approach

In delivering the curriculum it is essential to adapt the way lessons are approached. The situation in which teaching should take place will be determined by the tasks themselves. It is important to use a mixture of whole class, small group, pairs and occasionally, one to one activities.

Familiar and meaningful materials presented in real situations will promote motivation. Learning should take place in carefully graded small steps and new skills should build upon those previously acquired. Targets should be achievable and have one clearly focused aim. Tasks should be short and include repetition, reinforcement and the cumulative revisiting of previous skills. Make provision for focussed teaching groups for language development, reading, writing, teaching of grammar and conversational skills. Many students may require specific teaching of mathematics and basic numeracy, which should focus on the practical use of money the concept of time and calculator skills. Additionally, provision should also focus upon the development of personal and social development and functional life skills.

Approach

- ⌚ Choose appropriate context; whole class, small group, pairs, one-one
- ⌚ Use familiar & meaningful material
- ⌚ Build on previously learned skills
- ⌚ Break down all tasks into small steps
- ⌚ Short tasks
- ⌚ Achievable
- ⌚ One focused aim
- ⌚ Build in additional repetition reinforcement



OHPD08

Curriculum Planning

To ensure a continuum of learning, establish what the student might already know, what should be known as a result of prior learning and finally, what the student needs to know in order to lead a fulfilling and worthwhile life.

Curriculum Planning Framework

What a child **COULD** know.



What a child **SHOULD** to know.

What a child **NEEDS** to know.

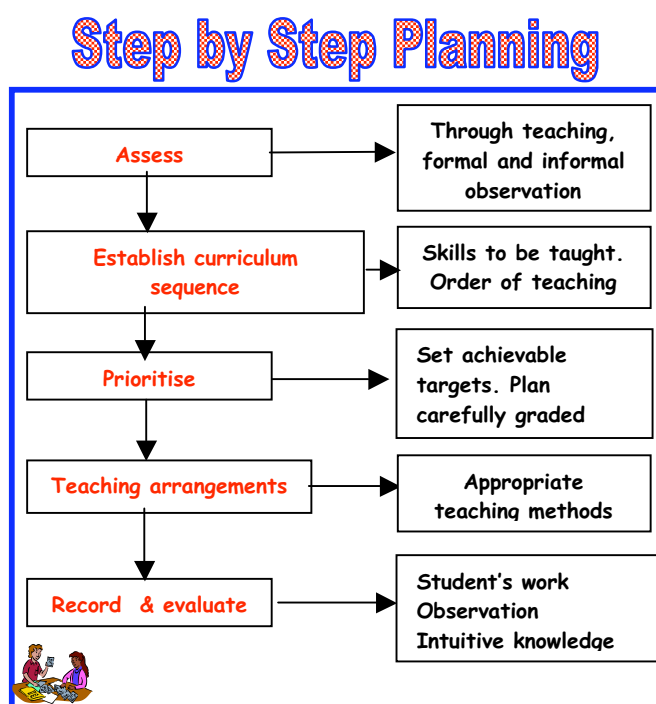
OHPD09

Step by Step Planning

Assess and gather all relevant information:

Encourage partnerships involving: pupil, school, parents, professionals, and all support staff. Identify likes and dislikes, interests, what motivates the student, strengths and weaknesses, preferred learning styles, performance as observed by all parties and specific medical conditions. This will provide a

basis in which to plan individualised teaching and learning programmes.



Curriculum sequence

Assess individual needs and understand the student's potential learning capabilities. Identify the purposes and goals and match the learning experiences to learning needs. Use appropriate teaching methods together with an appropriate curriculum. Establish the curriculum sequence and identify the skills needed and the order in which they should be taught. Look at what the child already knows and decide what to teach first. Sequence the learning into small carefully graded steps and determine the teaching arrangements, i.e. the methods, group, whole class and level of support, etc. Lastly, evaluate using a variety of techniques and responses.. Recognise the need to have different expectations and adopt a flexible attitude and approach when structuring the curriculum.

Individualisation

Assess skills attained then identify and build upon strengths. Decide upon priority teaching area(s) and set realistic goals and short-term targets. Prepare detailed measures to achieve aims:

- ⌚ Methods
- ⌚ Materials
- ⌚ Equipment

Plan carefully graded learning steps. Select the teaching methods that best suit the interests and preferred learning style of the individual student. Monitor progress and keep records against which success can be measured.

Elaboration

For a few students it may be necessary to focus upon particular areas and features of the curriculum and functional areas. Ensure cumulative building of a wide and varied range of concepts and skills using small graded steps. All new skills will be dependent upon abilities and level of previously acquired skills.

OHP D10

Presentation

In delivering the curriculum it is essential to adapt the way lessons are presented. They should be presented in a variety of ways to promote motivation and enable consolidation. Many students need their tasks to be presented in real situations using real materials in order to develop

- ⌚ Generalisation - applying skills to different tasks
- ⌚ Adaptation - using skills in a variety of situations

It is important to give instruction in simple and familiar language using short concise sentences and focus upon key words and phrases. Many students may require visual presentation either pictorial or by demonstration followed by visual reinforcement of tasks and simple written instruction to help them remain on task. Some may require printed instructions, diagrams, adapted worksheets, and flash cards with key words, phrases or sentences. Familiar formats enable the student to work independently.

Presentation

- ⌚ Present in a variety of ways to ensure consolidation and help with generalisation.
- ⌚ Reinforce oral instructions visually - keep as permanent reminder to stay on task.
- ⌚ Present all work visually.
- ⌚ Use print, diagrams, pictures, adapted worksheets, flash cards, sentence cards
- ⌚ Concrete and practical materials.
- ⌚ Demonstrate.
- ⌚ Peer support.
- ⌚ Use simple and familiar language.
- ⌚ Short and concise sentences.
- ⌚ Key words - teach carefully and provide list with their meanings and reinforce with illustration if necessary.

In-class support need not necessarily be provided by adults. Often peers are in the best position since they are more likely to be listened to and held in esteem.

Distribute learning and reinforcement over time rather than in lengthy stretches of time on one specific area.

OHPD11

Response

In delivering the curriculum it is essential to adapt the way students are expected to respond. Many students may have difficulty with written work and may need to use alternative methods that require little or no writing.

Matching or mapping pictures to word cards, phrase cards or sentence cards, or sorting cards require no writing. Recording this type of response can be made by photographing the student's work. Alternatively responses can

be scribed, however this does not promote independence and should be used sparingly.

Work sheets that include missing word/phrase, yes/no, true/false, ticks, prompt sheets with pictures and or words, question/answer links and multiple choice answers reduce writing and allow the student to work more quickly and remain focused on task.

Copying from textbooks, prepared text or from the blackboard can be enabled by providing shorter text highlighted within the longer text. Writing can be further enabled by providing words within the student's sight vocabulary or including a list of key words, phrases or sentences.

Response

Pictures, sentence or word card sequences

Card sorts

Cloze procedure

Prompt sheets using pictures and/or words.

Answer - question links.

Yes/No tick sheets

Computer

Scribe

If copying from board, provide shorter text highlighted within larger text

To enable writing - provide the words within pupil's sight vocabulary, including lists of key words.



Summary

OHPD12

Presentation

Teaching skills in real situations using real resources promotes generalisation and adaptation.

Varied tasks, worksheets and teaching styles will help to motivate the student and encourage student to become more flexible and adaptable to change and lessen their resistance to changes in routines, tasks and teaching styles.

- ⌚ Motivates
- ⌚ Discourages perseverance
- ⌚ Promotes adaptability

Building a variety of familiar worksheet formats promotes independent working. Students who have a short attention span or a limited short term memory benefit from the use of familiar formats.

Presentation

Should be

Real

Varied

Familiar

OHPD12

Differentiation

Use visual methods when presenting all new skills and back up new concepts in real situations. Ensure all prerequisite skills are firmly grasped and reinforce all new skills for as long as it takes. Distribute reinforcement over time taking breaks to enable processing and prevent de-motivation.

Differentiation

Think

Visual

Basic

Reinforce

Difficulties and differentiation strategies

Auditory Perception

Student may have difficulty in distinguishing between similar sounding words e.g. trees and cheese. This is a processing disorder in the brain and not due to hearing impairment.

Differentiation

Insist upon eye contact when giving instruction or in discussion. Ensure the student has understood instructions by asking the student to repeat instructions etc. Follow the guidelines for students with hearing impairment.

Hearing impairment

Some students may experience intermittent or fluctuating hearing loss. This can be identified by inconsistencies in response due to hearing loss rather than behaviour. Students may have more difficulty listening where there is background noise. There may also be difficulty making connections between the spoken word and associated ideas and concepts. Students may also display feelings of insecurity and confusion as a result of hearing loss.

Differentiation Strategies

Place student near front of class and speak directly to the student insisting upon eye contact at all times. Reinforce speech with facial expression, sign or gesture and whenever possible with visual backup such as pictures or demonstration. Write all new vocabulary on the board as it is said. When other students answer, repeat their answers aloud and rephrase as well as repeat words and phrases that have been misheard.

Visual impairment

May affect the development of concepts since associations may not be made between the spoken word and what is seen. Difficulties may arise in seeing text. May have difficulty making sense of line drawings. Difficulty with hand-eye co-ordination and may experience clumsiness.

Differentiation Strategies

Place the student close to the front of the class. Use larger type at least 24 point on all written instructions, information or worksheets. Make presentations, tasks, instruction, and worksheets simple, uncluttered and

in black and white only. Provide additional help with skills involving hand-eye co-ordination.

Speech and Language Difficulties

Students with Down's syndrome typically have a speech and language delay together with a degree of articulation difficulty but receptive skills are better than the expressive skills. Language delay affects a student's level of knowledge and understanding since lack of communication reduces interaction with others and reduces the opportunities for learning. Consequently, general knowledge is likely to be limited. Grammar can be of particular difficulty and students may encounter difficulty in producing longer sentences.

Access to the curriculum is greatly reduced as a result of a limited vocabulary, a limited understanding of the spoken word together with difficulty understanding instructions and the specific language of the curriculum. Additional problems may occur in learning and managing social language.

Differentiation strategies

Cognitive ability should never be judged upon competence in spoken language. When communicating with a student or giving instruction or information use simple, familiar language and short concise sentences. Avoid ambiguous vocabulary. Reinforce speech with facial expression, gesture and sign. Reinforce verbal instruction with print, pictures and concrete materials and emphasise key words always reinforcing visually. Check understanding by asking the student to repeat back instructions. Avoid closed questions and encourage the student to respond beyond single word utterances.

Be a patient and careful listener, your ear will adjust in time. Give sufficient time to process language and respond. Always use face-to-face contact and insist upon direct eye contact. However, be aware that some students may feel threatened by eye contact.

Teach reading since the printed word helps speech and language development. Grammar, which is generally more difficult, should be taught using the printed words on flash cards and in games.

Encourage student to speak aloud - providing visual prompts. A home - school diary or communication book can be used to relay events, topics, key words and concepts and provide a springboard for discussion. Make use of drama and role-play in real situations and encourage the student to lead.

Developing Writing Skills

Developing writing skills can for some students be a complex and frustrating task. The cause may be as a result of physical and/or cognitive developmental disabilities.

Physical

Students who experience low muscle, fine motor and coordination difficulties may need support in learning letter formation and with lengthy written tasks such as dictation.

Cognitive

Students who have difficulties with language development, short term auditory memory, organisational skills and sequencing may have difficulty completing unstructured written work that involves identifying relevant information, organising thoughts and sequencing words, sentences, events or information and taking notes.

Differentiation Strategies

Physical

Sitting position

Ensure student is seated correctly: check stability, positioning, light etc. The chair height should allow the student's feet to be flat on the floor and the forearm should rest comfortably on the desk.

Writing aids

Investigate additional resources. A sloping surface may help some students. Avoid hard, uneven or rough surfaces and provide a writing pad or similar surface with slight give, e.g. a simple solution is to use an exercise book below a worksheet. Investigate also different types of writing implements. If the student applies too light a pressure use a 2B pencil, a felt-tipped or roller-ball pen. If the pressure is too heavy encourage the student to hold the pencil further from the point. Provide multi-sensory alternatives to paper and pencil to keep student motivated when practising letter formation and make writing practice purposeful. Encourage the use of cursive and linked script to aid fluency and

beginning on the line. For students who are unable to master cursive script teach mastery of signature.

N.B. Right-handers need space to their right and left-handers space to their left.

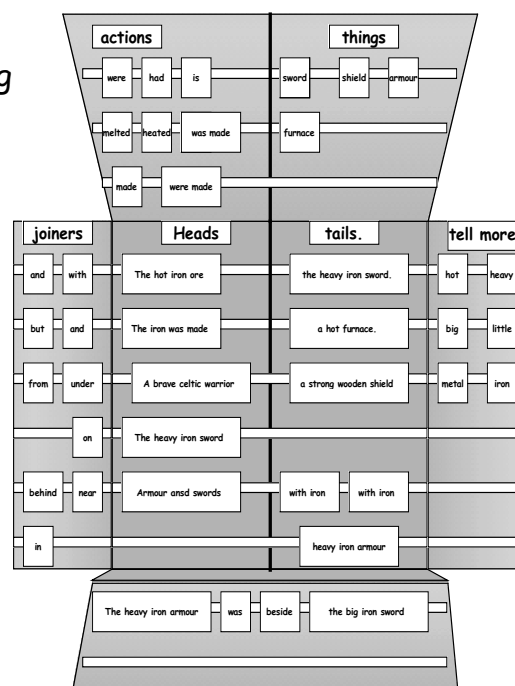
Differentiation Strategies

Cognitive

Provide visual support for all writing. A writing folder will provide a visual record of sight vocabulary. It can be used for single words, phrases or sentences. Grammar can be taught by setting aside specific areas of the folder for particular parts of speech. Make good use of picture cues, keyword cards.

Provide alternative methods of recording such as:

- ⌚ Scribing.
- ⌚ Underline or ring correct answer.
- ⌚ Fill in the missing word.
- ⌚ Sentence card sequences.
- ⌚ True/false, yes/no.
- ⌚ Circle/underline the correct answer.
- ⌚ Picture card sequences.
- ⌚ Predictive typing
- ⌚ Whole word computer programmes such as 'Clicker 4'.



Writing folder

Topics should be within the students' experiences and understanding. Use the conversation diary previously mentioned to reinforce the link between reading and writing.

Dictation should be paced to match the student's ability and take cognizance of muscle tone and motor skills. Use selected highlighted shorter version within the larger text when copying from the board. Provide practice in sequencing pictures, phrases and sentences.

Teach upper and lower case letters simultaneously. Learning upper and lower case separately adds to coding problems for some students.

Spelling

Use words that are within student's sight vocabulary and understanding. Use the, 'look cover-write-check' method which relies upon strong visual skills and not upon weaker auditory and articulation skills that are required in phonic methods. The use of phonics can be an aid to spelling particularly for students at secondary level who are able readers.

Short Term Auditory Memory Deficit

Spoken language only exists for a short time and greatly affects the student's ability to perform and respond to the spoken word. Many students fail to develop the usual strategies to increase memory span.

Students may have difficulty:

Understanding, assimilating, storing and processing spoken language, particularly when faced with longer or complex sentences and instructions.

They may have difficulty filtering out key information and have difficulty coping with information directed to the whole class. Remembering auditory sequences e.g. days of the week, months of the year and times tables may be also be problematic.

Differentiation Strategies

Teach rehearsal techniques by encouraging the student to silently repeat instruction and information. Teach categories and classification graded from simple tasks to complex. Give practice in taking messages again graded from simple to complex. Always limit amount of verbal instructions at any one time and allow time for student to process and respond. Repeat individually to student any information/instructions given to the class as a whole and try to avoid lengthy whole class instruction/discussion. Plan for visual translation and/or provide an alternative activity.

Shorter concentration span

Students may have a very short concentration span and be unable to stay on task for as long as their peers. Intense one-to-one supported learning is over tiring and demands a great deal more attention than that expected of typically developing peers who are working independently.

Students with Down's syndrome may have difficulty:

- 🕒 Coping with longer sessions.
- 🕒 Double lessons.
- 🕒 Distractions
- 🕒 Maintaining focus.

Differentiation Strategies

Provide breaks to give time to process and internalize information. Plan shorter sessions - two short sessions are more valuable than one long session. In secondary particularly, consider whether double lessons are appropriate or not. Provide a series of short tasks or activities within lessons and break them down into short, clear and concise steps. Focus on one aim at a time and vary the level of demand from task to task and the type of support. Make use of peer support to keep the student on task.

Provide incentives for completing tasks such as an activity box. This can be used to form a planned work programme by providing a range of activities to be undertaken independently, with a partner or preferably in a group. It can be used to provide structured choices, allowing the student to take responsibility for their own learning, prevent them from being unoccupied and reduce the need for withdrawal and 1:1 tutoring.

Generalisation, Thinking and Reasoning

Difficulty with language skills affects thinking and reasoning skills. Consequently, students with DS may have difficulty making decisions and choices, understanding abstract concepts and subjects e.g. in mathematics and in transferring skills, learned in one situation to another.

Differentiation strategies

Avoid tasks that involve memorisation of facts in the absence of understanding. Teach new skills using a variety of methods and materials in wide range of real and abstract contexts. Reinforce abstract concepts with visual and concrete materials and build in opportunities to experience occasional errors. Encourage decision and choice making initially giving a limited number of choices and building towards a greater number of choices.

Be clear and specific when giving instructions and avoid ambiguous language. Do not assume that the student will transfer knowledge automatically. Offer additional explanations and demonstrations.

Difficulties with Consolidation and Retention

Students may generally take longer to learn and to consolidate new skills and display inconsistencies in the successful completion of a task and may seem to have grasped what was learnt one day then often have unlearnt it on the next! Research by Wishart (1993) indicates that they may have an inefficient learning style that affects acquisition, consolidation and making use of new and acquired skills.

Students may compromise the consolidation of new skills on "easy" tasks with a poorly motivated performance or compromise consolidation of more difficult tasks by using task avoidance strategies. They may display poor self-motivation in mastering skills together with low arousal and poor persistence. Sensitivity to failure is relatively common and many students may be content to be passive learners. They may have surprisingly high levels of ability but put it to very inefficient use.

In general students experience a deficit in exploratory behaviour, have difficulty correcting wrong responses.

Differentiation Strategies

Provide shorter tasks that are within their capabilities and extra time and opportunities for repetition and reinforcement. Present new skills and concepts in a variety of ways, using concrete, practical and visual materials.

Ensure that previously learnt skills have not been forgotten. Make use of errorless learning in certain situations by teaching students new tasks by guiding them through each step correctly then reducing the prompt as students becomes more skillful. Use peers as models and to motivate learning and give encouragement, praise and positive messages often.

Task avoidance

Many students may make use of avoidance strategies that undermine the learning process. They may inappropriately use social behaviours to distract adult attention and avoid learning and may only be prepared to work on tasks that fall within a narrow cognitive range. They may not always participate fully in the task and can be just as likely to opt out immediately after success as after failure. Some students may actively

avoid difficult tasks by resorting to various diversionary tactics. The avoidance behaviours have two common features. They are:

- ⌚ Usually maintained until successful.
- ⌚ Frequently involve misuse of social skills.
- ⌚ Distract from their own and the concentration of others.

Consequently, they may miss key input in terms of any sequence of skills.

Differentiation Strategies

Develop a range of strategies to deal with avoidance ensuring all members of staff are firm and consistent at all times and are aware of strategies to be employed. Identify patterns or recurring behaviours, prioritise, target and deal with one behaviour at a time. Use visual student target sheets and reinforce desired behaviour immediately with visual/concrete rewards. Ensure the students understand both positive and negative aspects of their behaviours and reinforce in visual form if necessary. Ignore attention-seeking behaviour within reasonable limits. The support person should not be the only adult having to deal with the behaviour. The class teacher should play an active part.

Use peers to encourage co-operation and motivation from the student.

Implications for Teaching and Learning

Summary of Key points

Understand the child's potential learning capabilities.

No plateaux - inappropriate materials/teaching strategies/lack motivation. Same stages of cognitive development but at a slower pace. Content with familiar routines and often resistant to change. Introduce change gradually in an unthreatening way and explain any changes in advance to instruction to avoid tantrums.

Visual learner - use multi-sensory teaching methods. Tend to find it relatively easy to develop a sight vocabulary.

All learning must be in small steps and all new concepts need to be reinforced and revisited as skills not practised may be lost.

Ensure concepts are firmly grasped before moving on to new ones.

Difficulty doing more than one thing at a time - simplify tasks.

Difficulty understanding spoken instructions. Use simple language and check understanding. Use single, simple instructions, avoid complex instruction.

May put literal interpretation on information and instructions. Avoid ambiguous reference, (*The camel caravan trudged the old silk roads*'). and the use of unfamiliar vocabulary and unfamiliar sentence patterns, e.g. technical vocabulary (*'After retting, the fibres are removed by scutching.'*).

Create real situations for communication.

Encourage listening and attending and insist upon good eye contact.

Concentrate upon necessary vocabulary.

Provide a child-centred curriculum with achievable targets, and a realistic time scale.

Use task analysis break down tasks into simple steps, carefully graded.

Make use of backward chaining where appropriate i.e. last first.

Record progress in a simple format e.g. pupil's work, checklists etc.

Analyse the task, identify each skill and the steps to reach target.

Precision teaching structured, carefully graded steps leading to fulfilling target.

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"Be patient."

"Slow is fast enough."

Remember!

"I hear I forget

I see I remember

I do I understand"

Recommended reading

Bird, G., Alton, S. & Mackinnon, C. (2000) 'Accessing the Curriculum',
Downs Syndrome Issues & Information, Down Syndrome Educational
Trust, Hampshire.

Carpenter, B., Ashdown, R. & Bovair, K. (1996) 'Enabling Access', David
Fulton Publishers.

Lewis, A. (1995) 'Primary special needs and the national curriculum',
Routledge.

Wishart J.(1993) 'Learning the hard way: Avoidance strategies in young
children with down's syndrome'. Down's syndrome Research and Practice.
Vol 1. no. 2 pp 47 - 56.

Section 4

Speech, Communication and Literacy

How Spoken Language is Acquired

Introduction

Language is everywhere. It is one of the most important life skills.

Society could not function without it to explain inventions, relay information or ideas, and express needs. Language, spoken, signed, pointed to, or combinations of all three are vital tools for students with language delay or language difficulty.

OHPL01

Language and Communication

Developing communication is as much a basic human need as seeking food and comfort and for many students it is a simple process. For others this may not be the case, e.g. students with Down's syndrome experience significant language delay. However, all students need to communicate in order to reach their true potential.

The development of spoken language

When we refer to speech we are referring to one form of expressive language. To understand how speech develops it is important to make a clear distinction between:

- ⌚ Receptive language
- ⌚ Expressive language
- ⌚ Speech

OHPL02

Receptive Language

This is the knowledge and understanding that is gathered from the environment, i.e. from people, objects, sounds, words and gestures. Exposure to receptive language is vital to the development of communication.

Language & Communication

Basic human need

Important life skill

Used to:
Relay information
Express needs

Communication vital

Spoken
Signed
Pointing
Combination of all three



Receptive Language

Knowledge and understanding gathered from:

Environment

People

Senses

- Touch- manipulating objects
- Auditory stimuli -sounds and words
- Visual stimuli
- Taste
- Smell



OHPL03

Expressive Language

Is the communication made through crying, laughter, words, gesture, sign language or communication aids.

OHPL04

Speech

Speech is the physical production of sounds. It is developed by combining receptive language and sound production into words. Speech development being dependent upon receptive language is directly affected by the lack of communication, which in turn reduces the exposure to receptive language, language experience and the opportunities to learn new information. The level of delay or difficulty in sound production and speech production is likely to affect the level of speech clarity. It is important to bear in mind that speech is only one means of communication.

Students with Down's syndrome commonly have delayed language development. Some may have a language disability such as dyspraxia or dyslexia and some may have a communication disorder. None of these can be attributed to Down's syndrome but to an additional disability.

75% of students with Down's syndrome experience inconsistency between understanding of language and speech production. Consequently they understand more than is assumed. These students are slow to develop expressive language and this will always lag behind the ability to understand. The gap between certainly grows with age.

Expressive Language

Communication made through:

Crying
Laughter
Words
Gesture
Signing
Communication aids

Speech is only one form of communication

Speech

Only one form of expressive language

Physical production of sounds
Receptive language + sound production + words
Dependent upon receptive language
Affected by lack of communication
Clarity and articulation improve with practice

OHPL05

Use of Language

Vocabulary

The spoken language of students with Down's syndrome is late to appear, is relatively more delayed than other areas of development and is slower to develop once it does begin. During the early stages it may be up to two and three-word phrases. Later students appear to use more nouns, compared to verbs, prepositions and other parts of speech. The use of shorter sentences and simpler grammar i.e. "telegraphic" speech is common and the content is limited to relatively concrete, descriptive material. At all ages students encounter articulation difficulty.

Use of Language

Vocabulary

Slow to learn new words

Use of single word utterances common

Acquisition does not keep up with mental age

Range of words understood - less than peers

Shorter length of sentences

No limit to vocabulary acquisition

Requires adult focus

Grammar

More delayed than vocabulary

Needs to be taught

Comprehension of grammar in advance of use

Students are likely to be slow to learn new words and sentence structures and the rate of this acquisition does not keep up with their mental age. The range of words understood and length of utterances will be less than peers. However there is no limit or ceiling to vocabulary acquisition. It requires focus from early intervention and throughout adult life.

Grammar

This is likely to be more delayed than vocabulary. It may not be incidentally learned and in the majority of cases will need specific structured teaching. However, the comprehension of grammar for most students' is likely to be well in advance of its use.

OHPL06

Social Use of Language

This area of language is usually a strength. Students with Down's syndrome do tend to understand the conventional rules of conversation e.g. when it is their turn to speak and when to listen etc. Although speech may be delayed they are able to make up suitable messages for the audience and are usually skilled in the non-verbal aspects of pragmatics, gesture and facial expressions. Difficulties that do arise are generally in asking questions, staying on topic, requesting and clarifying statements.

Use of Language

Pragmatics

Understand the conventional rules of conversation

Know when to speak and when to listen

Skilled in:

Non verbal language

Facial expression

Gesture

Difficulties

Staying on topic

Asking questions

Making requests

Clarifying statements

OHPL07

Typical Language Development

In order to plan and undertake any programme to improve speech and communication it is important that those working with the student,

"become familiar with the stages of speech and language development in typically developing children and with what is currently understood about the processes that influence their rate of progress,"

(Buckley and Bird 2002)

Most students seem to follow the expected normal pattern of development and go through most if not all of the language development stages. Understanding

the language development stages is crucial in understanding where a student might have a problem. It is important to know whether the student has a problem with receptive or expressive language or both.

Typical Language Development

Vocal Play	→	0 months	
Babbling	→	6 months	1 word
Jargon	→	12 months	3 words
Imitation	→	18 months	22 words
Phrases	→	24 months	272 words
Sentences	→	3 years	896 words
Paragraphs	→	4 years	1870 words
Nearly correct grammar	→	5 years	2289 words
Full command of English language	→	6 years	2586 words

Awareness of the causes can highlight a student's particular problem. Appropriate assessment techniques will identify the level of language development and help in the selection of an appropriate speech and communication programme.

Occasionally, a student may require signing, a communication board with pictures or other types communication aid. Remember to work at the developmental stage of the student not the chronological age.

OHP08

Factors Affecting Language and Communication

Poor working memory (Short term memory)

The short-term memory, (STM) is the area of the brain where information presently being processed is stored temporarily. In students with DS it is highly likely to be a weak area. The information fades consequently needing rehearsal, prompting and over exposure to spoken language. Adult intervention is vital in providing the necessary verbal and visual support.

Memory capacity in all individuals affects the rate of learning of new words, in other words, the better the STM the better the capability to learn new words.

Factors Affecting Language & Communication

Poor short-term auditory memory

Sensory impairments

Auditory

Visual

Auditory perception

Speech articulation

Motor difficulties

IQ not a predictor of language development

Sensory Deficits- Visual and Auditory

Auditory and visual deficits of any kind limit the receptive language and affect what the student can experience from the world around them. For instance, 80% of students with Down's syndrome experience hearing loss due mostly to glue ear. It is important to identify any sensory difficulty as early as possible. Adult input is crucial, at the earliest possible stage in order to stem the backward flow in language development.

Auditory Perceptual Impairment:

Students who have perceptual impairment encounter difficulty discriminating between similar sounds, e.g. 'trees' and 'cheese'. This is not an auditory difficulty but is in the way the brain interprets the information it receives.

Speech Articulation

Students who have any type of physical speech impairment encounter some degree of difficulty with speech production and articulation. They may have excellent receptive language but be physically unable to produce some of the sounds necessary for speech, e.g. students with Down's syndrome have a smaller mouth, weaker tongue muscles causing difficulty keeping the tongue in the mouth.

Fine and Gross Motor difficulties

Fine and gross motor difficulties, limit the student's interaction with the world around them, e.g. being unable to manipulate and learn about objects. This reduces the student's opportunities to enrich their receptive language consequently, creating limitations on language development.

Language Development and Learning difficulties

Students with learning disabilities acquire language more slowly and require a great deal more language stimulation and encouragement through the use of motivational activities. It is important to be aware that they will go through the same developmental stages but at a slower pace.

Developing vocabulary, speech clarity, grammar and communication skills

Many students with Down's syndrome make significant progress during the teenage years in both receptive and expressive language development. Buckley and Bird, (2002) state that,

"the vocabulary of teenagers with Down's syndrome continues to develop steadily, and that new vocabulary should be taught during the teenage years".

It is important that students have the opportunity to learn the vocabulary relevant not only for the curriculum but also for age-appropriate interests, emotional, social, work and leisure needs.

It is therefore necessary to improve the quality and quantity of everyday communication and to develop all of the underlying skills. Clear targets need to be identified and records kept of the student's progress.

Adults, peers and all those in contact with the student must improve their own way of communicating and listening to him/her and aim to increase the quantity of daily talk.

Many students with Down's syndrome initiate fewer conversations than their typically developing peers. The greater the exposure to communication opportunities the greater the opportunities to practise talking. All language skills improve with practice for example:

1. Planning and producing words
2. Sentences
3. Use of grammar together
4. Phonological skills
5. Speech articulation

Typically developing teenagers acquire all of these skills by talking naturally to each other. It is critical to the language development of students with language delay that specific programmes are undertaken to provide as many quality opportunities for speech and communication for all students with speech and language delay or difficulties.

OHP13

Gahagan Game

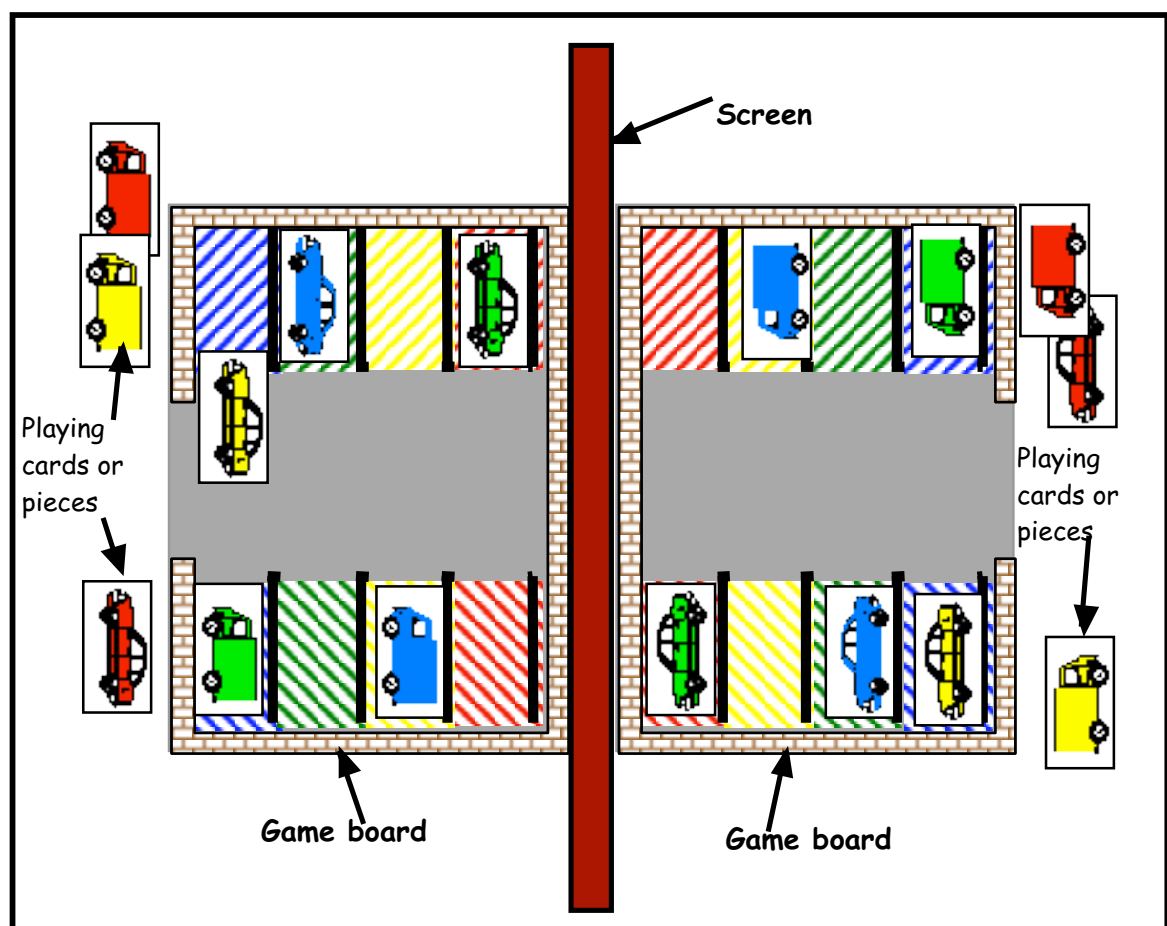
A game for two players. It can be played as a group with two people playing and others as a silent audience.

The players sit opposite with a game board each and a screen erected between the boards as shown.

Each player takes a turn of being the instructor and the follower.

Player 1, the instructor, gives clear and simple instructions as to where player 2, the follower, is to park each car. e.g. "put/drive the yellow car in/on the left and blue parking space."

The game continues in this way until all cars or objects are placed. The screen is then removed and the pieces checked and discussed. This can be done as a group activity or between the two players.



Developing Speech and Language

Individualised Education Programme

Ensure that students' language skills are regularly assessed and evaluated by a trained speech therapist. Capitalise upon strengths and take note of weak areas when planning intervention. Be consistent and use same strategies to avoid confusion. Often students perform differently in different environments and for different people. Consequently, co-operative working practices which involve the student, parents, teaching staff, learning support assistants, and other professionals, i.e. therapists will help to provide a complete student profile.

Strategies

Listen carefully your ear will adjust to the student's speech and be patient as the student may be slow to process language. Additionally, encourage patience in peers. Contrive real situations to promote communication skills.

OHPR01

Reading

The promotion and continued development of reading skills will provide a clear benefit as it provides opportunities to acquire receptive language and promotes speech articulation. It is vital to teach new vocabulary and its meaning side by side and using the 'Look and Say' method is usually most effective. In a minority of cases it may be necessary to make use of alternative means of communication or use a mixture of speech and signing.

Signing beneficial to teaching

- ⌚ Concentrates on necessary vocabulary, simplifies tasks.
- ⌚ Encourages good eye contact, (insist upon).
- ⌚ Develops listening and attending skills.,

Reading

Improves Language Skills & Aids Understanding

Develops:

Receptive language
New concepts
Access information
Independence

Expressive language
Vocabulary
Articulation
Communication

Tailor the spoken and written language to suit each individual student. Avoid complex sentence structure and be aware of word ambiguity. Keep instructions simple, i.e. one thing at a time. Avoid conversation stoppers and use the open ended questioning style that discourages 'yes and no' answers.

Give the student time for processing language. Encourage a slower pace and create activities that promote the comprehension of selected chunks of text.

Although pictures are beneficial when teaching the understanding of new vocabulary there are occasions when they may inhibit learning by distracting attention from text. In other words the student may use the picture as a clue to what the text is likely to be. When assessing comprehension use the text without the pictures. Another helpful strategy is to provide matching activities such as matching text to corresponding pictures which will give a clear indication of the level of comprehension.

OHPRO2

Reading

The phonic approach may or may not be appropriate for some students as it depends upon good auditory skills, sound production, short-term memory and attention span. Difficulties that arise in one or all of these areas is likely to lead to little success in the use of phonics in decoding unfamiliar words. However, using the sight vocabulary attention can be drawn to initial sounds of words, blends and ends of words and may be useful for spelling and writing. (Proceed with caution.)

Reading

Visual approach

Look and say
Strong visual skills
Learn by demonstration
Match - select - name - understand

Phonic approach

Phonics - possible problems
Auditory
Perceptual
Sequential
Articulation



Structured language practice promotes speech production and articulation. Skills in reading and speech develop side by side. Visual discrimination and visual memory are more effective than auditory pathway. Support learning activities with visual information wherever

possible. No two children are identical, different activities suit different children. Remember all children progress at different rates.

It is vital to teach all new vocabulary alongside the associated concepts and ensure understanding. Otherwise the reading will be merely 'barking at print'. Since students with Down's syndrome are visual learners the 'Look and say' method is most beneficial. The amount of new vocabulary that is be introduced and the level of teaching will depend upon the language attainment of the student. From the following stages choose the appropriate level for each individual student

OHPR03

Building Phrases

Two-word Phrases

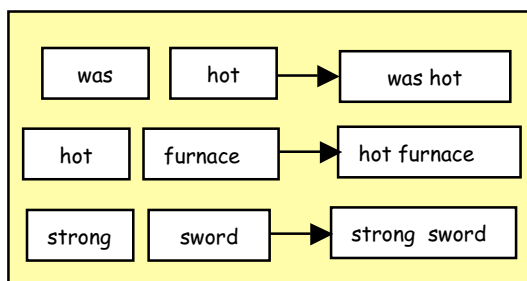
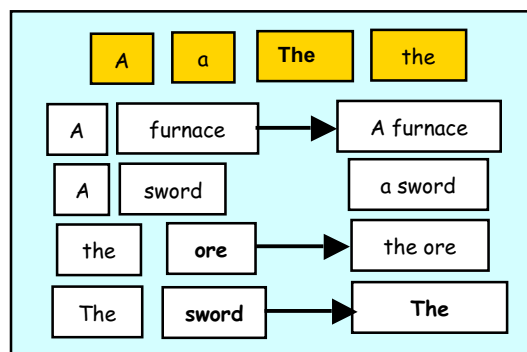
Using

- ⌚ 'A' and 'The', e.g. "A furnace", the sword.
- ⌚ Noun and verb e.g. "was asleep".
- ⌚ Noun and adjective "hot furnace".

New words can be used to create phrase cards to encourage reading chunks of text rather than individual words.

Building Phrases

Putting 2 words together



OHPRO4

Building Phrases

Continue by extending the phrases as follows using different parts of speech such as prepositions, pronouns, conjunctions which will provide learning of grammar, an area of particular difficulty for some students:

- ⌚ Add 'a' or 'the' to two word phrases.
- ⌚ Put two two-word phrases together.
- ⌚ Join two two-word phrases together using 'and' or 'with'.
- ⌚ Using the previous phrases add 'the' or 'a'.
- ⌚ Join the previous type of phrases using the prepositions 'in' or 'on'.

Building Phrases

Extending the phrases

A	a	The	the
with	and	in	on
the	hot furnace	the hot furnace.	
the hot	iron ore	the hot iron ore	
iron ore	and	hot furnace	
The iron ore	and	the hot	
A heavy shield	with	a strong sword	
the hot iron ore	in	the hot furnace	

OHPRO5

Building Sentences

Build towards creating grammatically correct sentences. Flip boards can be made where the student creates a variety of sentences by flipping cards over. Nonsense sentences can be made which adds a touch of interest and makes the exercise fun.

Building Sentences

Using flip boards

The ore	was in	the furnace.
	was beside	

OHPRO6

Building Sentences

Sentence Folders can be made using document folders available from office supply companies. Self-adhesive Velcro™ laid in strips across the folder and likewise on the back of word, phrase or sentence cards provides a tidy way of keeping and working with the cards. Suggested activities:

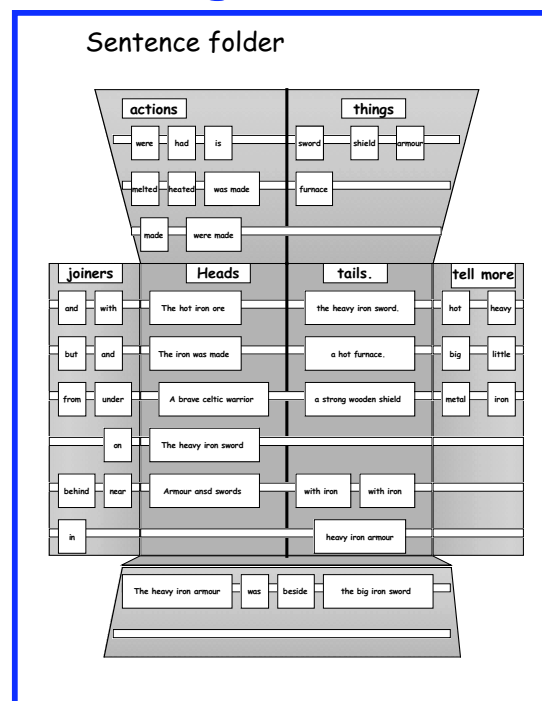
- ⌚ Two or three word phrases using adjectives and nouns.
- ⌚ Two and three word phrases using noun and verb.
- ⌚ Short phrases using conjunctions.
- ⌚ Short phrases using prepositions.
- ⌚ Heads and Tails putting beginnings and endings of sentences together.
- ⌚ Building paragraphs using heads and tails or full sentence cards.

OHPRO7

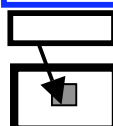
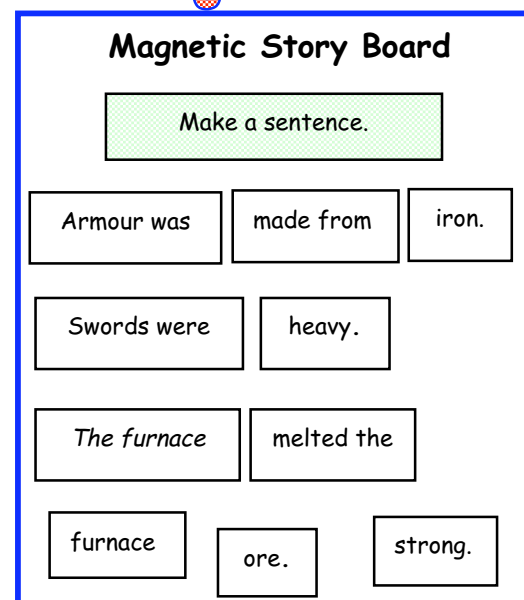
Building Sentences

Phrase cards like these can be used to teach grammar and sentence structure. They are also helpful in developing writing skills alongside reading. They can have magnetic strips added and be used on magnetic boards.

Building Sentences



Building Sentences



Magnetic tabs can be attached to reverse side of word and phrase cards.

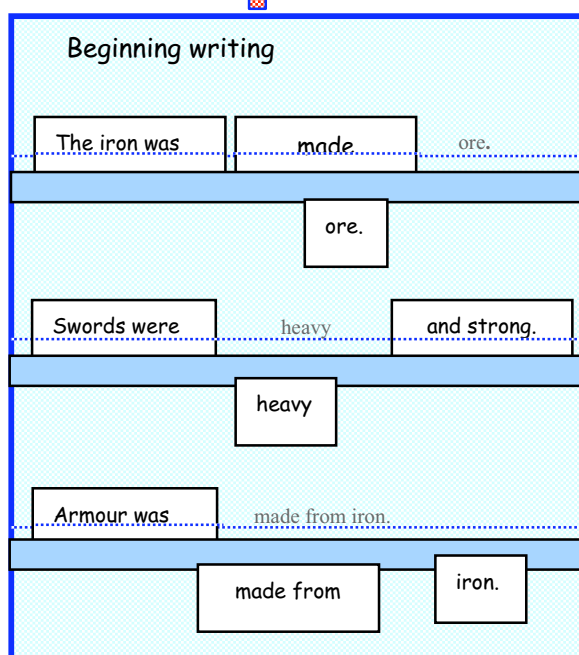
OHPRO8

Building Sentences

Where students have great difficulty writing, phrases and sentence cards can be used as an alternative method of response and can be photocopied and kept as a record of work. Cards laminated with matt film can be used to build writing skills.

These can be written on using a soft B pencil. Phrase cards can be placed to begin or build part of a sentence leaving a word or phrase to be written by the student.

Response



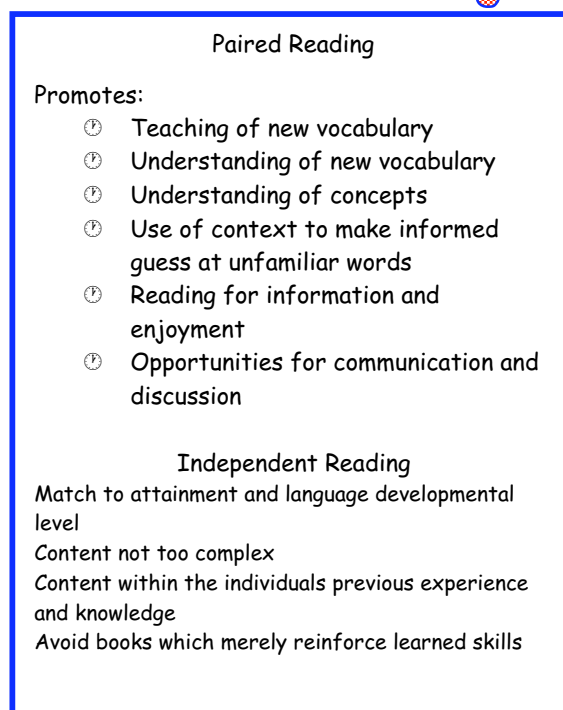
OHPRO9

Additional Reading

Paired reading will give opportunity for early work with sentences. It will allow students to enjoy books at a higher level and provide opportunities for communication, discussion and learning about new concepts.

When developing independent reading match the text to the attainment and language development levels of the student. Ensure that the content is not too complex and is within the student's previous experience and breadth of knowledge. Avoid books which merely reinforce learned skills. Make use of paired reading activities as it helps promote the teaching and understanding of new vocabulary and concepts. Additionally, it encourages the use of context to

Additional Reading



make informed guess at unfamiliar words. Paired reading also allows the student to enjoy reading as an activity, to gain information and it also provides opportunities for discussion and communication.

Visual discrimination and visual memory are more effective than auditory methods. Support all learning activities with visual information wherever possible. No two students are identical and different activities suit different students, so adapt ideas and develop activities to suit the student. Do not expect quick results since students progress at different rates.

Recommended reading

Alton, S. (2001) Children with Down's syndrome and Short-term Auditory Memory Information Sheet, Down's Syndrome Association.

Alton, S. (2001) Children with Down's syndrome - Reading Information Sheet, Down's Syndrome Association.

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's syndrome, Down's Syndrome Issues and Information, Down Syndrome Educational Trust, Hampshire.

Bird, G. & Buckley, S. (2002) Speech and language development for teenagers with Down syndrome, Down's Syndrome Issues and Information, Down Syndrome Educational Trust, Hampshire.

Bird, G. & Buckley, S. (2002) Speech and language development for individuals with Down syndrome - An overview, Down's Syndrome issues and information, Down Syndrome Educational Trust, Hampshire.

Kumin, L. (2001) Classroom language skills for children with Down syndrome, Woodbine House.

Oelwein, P. (1995) Teaching Reading to Children with Down Syndrome, Woodbine House.

Section 5

Numeracy
and
Mathematics

Numeracy and Mathematics

The National Numeracy Strategy defines numeracy as:

"A proficiency which involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an inclination and ability to solve number problems in a variety of contexts. Numeracy also demands practical understanding of the ways in which information is gathered by counting and measuring, and is presented in graphs, charts and tables."
(DfES 2000)

OHPM01

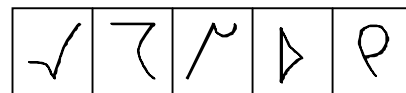
Counting

Exercise 1. The activity is designed to give participants the experience of bewilderment when faced with too many new and unfamiliar concepts introduced too quickly.

Method:

- Participants are asked to repeat the words, acka, bora; caru, din, eron which are representative of the numerals from 1 - 5.
- They are then asked to rote count using the symbols.
- Next, groups of objects are shown and, using the new language, participants asked in random order to tell how many of each.
- Repeat the exercise while on OHP 01 showing only the symbols and words.
- Repeat the exercise once more showing all of OHP01.

Learning to Count



OHPM02

Operation symbols

Exercise 2. symbols only give the names. Do not show the words at this point. This will be used at a later time in the presentation.

Operation symbols



dedda



tabbus



plytlum

OHPM03

Informal Stage

Generally, pupils with DS encounter difficulty with mathematics. The learning processes of these pupils may be strongly influenced by the factors that affect all other areas of the curriculum.

Accomplishments in mathematics and numeracy vary and they generally have significant difficulty. It is helpful to note however that the developmental stages and consequently the acquisition of mathematical concepts for students with Down's syndrome appear to be similar to that of their typically developing peers. Number competence is linked to level of knowledge and understanding and not to having Down's syndrome. Children at similar developmental levels share the same levels of competence in counting skills and counting principles. There are unlikely to be plateaux in learning if good teaching methods are applied and the level of attainment by any child is like any other student, not predictable.

Informal Stage

Significant difficulty acquiring concepts

Same developmental stages as peers
Same way as typically developing peers

Attainment

Wide range in numeracy and mathematics
Levels by any child is not predictable
IQ not a predictor of attainment
Down's syndrome not a predictor

Difficulties

Due to factors affecting all areas of learning
External - other adults
Internal - characteristic weaknesses

OHPM04

Basic Skills and Concepts

The initial 'informal' stages of mathematics learning are vital to the development of skills in matching, comparing, sorting, labelling, mapping and ordering. They are acquired in an unstructured manner as are language and conversational skills, through interaction with peers and adults and by being absorbed in the day-to-day activities in the environment.

Many pupils with DS may have a limited knowledge and understanding of basic concepts, for instance 'same', 'different', 'more', and 'less' etc.

Informal Stage

Basic concepts need to be acquired
'Size, amount, more and less, same, different'
So simple - sometimes overlooked

Acquired in an unstructured manner
During day-to-day activities
Interaction with peers and adults
Interaction with environment

Vital to the development of skills
Matching
Categorising
Comparing
Labeling
Mapping
Ordering

Some concepts may be omitted
Unstructured development
Characteristic weaknesses

OHPM05

Inhibiting Factors

Although there are many characteristics that can be attributed to specific disabilities it is important to note that no student will experience all of them. The characteristic impairments or disabilities that are often attributable to Down's syndrome are:

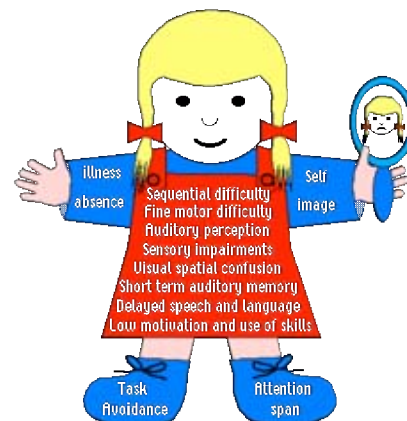
- Language delay.
- Poor short-term auditory memory.
- Visual impairment.
- Auditory impairment.
- Auditory perceptual difficulty.
- Fine motor difficulty.
- Low motivation and use of skills.
- Short attention span.
- Task avoidance.

Inhibiting Factors

Presentation
Task
Pacing
Timing
Response

**Curriculum
Educators**

Instruction
Ambiguous
Relevance
Complex
Verbal



Excessive Adult Support and intervention
Learned helplessness
No independent working
Lack of self motivation
Poor self esteem

These characteristics may have an effect upon the rate of educational progress and levels of achievement. However, it should be recognised that the main inhibiting factors are those that can be created, often inadvertently, by those responsible for the learning that takes place, for example:

Presentation:

- Tasks - too easy/difficult.
- Timing - appropriate to cognitive development of skills attainment.
- Pacing - going to quickly/slowly.
- Response - too heavily dependent upon written work.

Instruction:

- Ambiguous language.
- Complex sentences.
- Unfamiliar language.
- Relevance of language to the task.
- Emphasis on verbal - -visual backup.

OHPM06

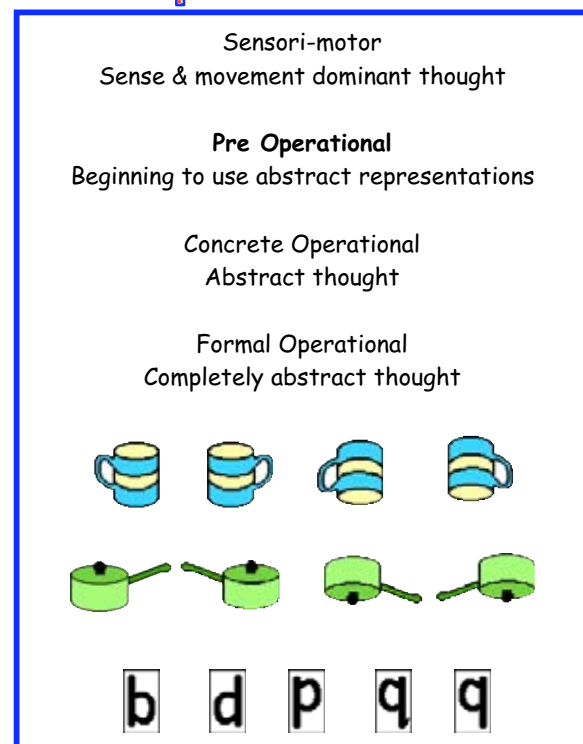
Developmental Readiness

Ariel (1992) states that, in order to undertake mathematical operations, all pupils must attain a general developmental readiness and must be competent in classification, one-to-one correspondence, the cardinal and ordinal aspects, conservation, flexibility and reversibility. In some cases there may be pupils who need to develop language number concepts such as same and different, more and less, etc. and attributes such as colour, size or shape.

Practice, reinforcement, evaluation and assessment of

these concepts must be provided over a longer period of time for pupils with mathematics learning difficulties than for their typically developing peers.

Developmental Readiness



Concrete materials, such as Cuisenaire rods, Numicon and Unifix etc. allow pupils to visualise numerical concepts, computation, and problem solving skills. Adaptations and modifications can be implemented to help pupils succeed in all three areas.

How concepts are developed

According to Piaget's theory our experiences are stored in schemes. A scheme develops by attempting to fit every object encountered into that scheme's pattern. In this way schemes become general purpose, so the scheme for picking up a rattle becomes a scheme for picking up small objects. As these schemes develop they become problem solving skills (for games or mathematics), physical coordination skills (as in dance or cycling), and expectations (such as expecting things to fall downwards and day to follow night).

Structures are families of similar schemes and there are four of these. They are not physical groupings in the brain, but a way of classifying schemes. In the same way we say lions and pet cats are all types of cat, despite them being in different countries. In increasing complexity they are;

- Sensori-motor - sense and movement dominated thought.
- Pre Operational - beginning to use abstract representations.
- Concrete Operational - abstract thought.
- Formal Operational - completely abstract thought.

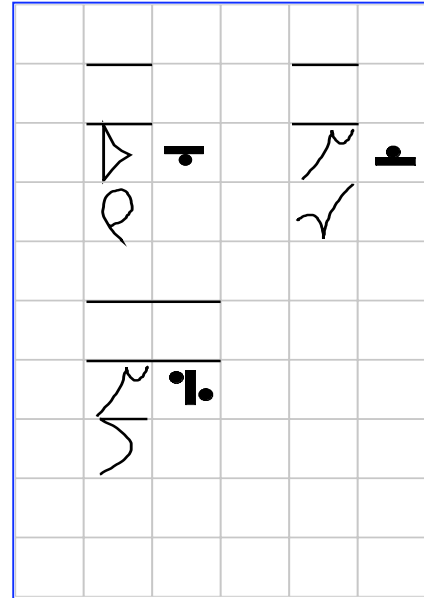
As we mature our schemes change and move from one structure to the next: our skills are growing. These structures give their names to the stages of development that they dominate. Piaget's stages are important because they tell us what skills and concepts a child must learn and the order in which they acquire these skills as they grow. In other words, some concepts may well be beyond the ability of particular students at a particular time but may be appropriate at a later stage in development. This will have particular impact upon the timing in teaching certain areas of the curriculum.

Working with Numerals

Aim: to expose participants to the experience of working with unfamiliar and non-reinforced skills and concepts.

Show OHPM07 asking participants to work out the following algorithms. Ask what are the problems and elicit that:

- # Working with Numerals



Developing Concepts

- Information available from the environment, people and experiences
- Accuracy of information depends upon
 - Accuracy of the information actually received and the ability to process
 - Accurate processing
 - Reliable long-term memory
 - Ability to recall previous knowledge

Concept Development

- ⌚ Information available
- ⌚ Accuracy of information
- ⌚ Information received
- ⌚ Accurate processing
- ⌚ Reliable long-term memory
- ⌚ Ability of the individual

OHPM09

Complex Processes

Complex processes such as long division and multiplication require concentration and memory i.e. for times tables and holding on to data sequencing and visual spatial skills, and the ability to recall and select the correct operation. Students who have impairment or difficulty in one or more of these areas are likely to find the more complex mathematical operations virtually impossible.

Complex Operations

73 x 96 Steps

involved

- | | |
|--|---|
| 1. Write sum. | 20. Write 5 in hundreds column. |
| 2. Identify 6×3 . | 21. Write 6 in thousands column. |
| 3. Correctly respond 18. | 22. Add units $0+8$. |
| 4. Write 8 in units column. | 23. Respond correctly 8. |
| 5. Carry 1 ten. | 24. Write 8 in units column. |
| 6. Identify 6×7 . | 25. Add tens $7+3$. |
| 7. Correct response 42. | 26. Correctly respond 10. |
| 8. Remember to add carried 1 ten to 2 tens. | 27. Write 0 in tens column. |
| 9. Correct response 3 tens. | 28. Carry over 1 hundred. |
| 10. Write 3 tens column. | 29. Add hundreds $4+5$ remember + 1 carried over. |
| 11. Write 4 hundreds. | 30. Correctly respond 10. |
| 12. Identify 9×3 . | 31. Write 0 in hundreds column. |
| 13. Correctly respond 27. | 32. Carry over 1 thousand. |
| 14. Write 7 in tens column. | 33. Add thousands $6+1$ carried over. |
| 15. Carry over 2 hundreds. | 34. Correctly respond 7. |
| 16. Identify 9×7 . | Answer 7008 |
| 17. Correct response 63. | Seven thousand and eight. |
| 18. Remember to add carried 2 to 3 hundreds. | |
| 19. Correctly respond 5. | |

OHPM10

Visual spatial Impairment

Students may encounter difficulty when differentiating between numbers:

6 and 9 2 and 5 17 and 71

Operation symbols

+ x - = < >

The directional aspect of maths may produce difficulty with:

- ⌚ Using a number line.
- ⌚ Vertical addition.
- ⌚ Left-right regrouping and aligning of numbers.
- ⌚ Writing across the paper in a straight line.

Visual Spatial Impairment

Difficulty differentiating between numbers:

6 and 9 2 and 5 17 and 71

Operation symbols

+ x - = < >

Problems with directional aspect of maths:

Using a number line,

Vertical addition

Left-right regrouping and aligning of numbers

Writing across the paper in a straight line.

OHPM11

Language of Mathematics

Prior to undertaking any mathematical operation or task, the language skills and short-term memory of the student are the first skills to be put to the test. Difficulties in processing language together with remembering what to do and in which order, restricts the capacity to complete tasks. Buckley & Bird (1994). Calculations and word problems all require language therefore it is important to teach all mathematics vocabulary and the associated concepts together.

Difficulties that arise are due to:

Language of Maths

Child needs to:

Understand what is being asked
Learn meaning of maths vocabulary

First skills tested

Language understanding
Short-term memory

Verbal only may be forgotten

Slow language processing
Difficulty remembering instructions
Limited capacity to complete tasks

Think visual

Representation of task instruction
Demonstration
Pictorial representation,
Words, numerals and symbols

- The unfamiliar language of mathematics that is unlikely to provide a basis for understanding.
- The use of symbols to represent numbers and concepts cannot be decoded using contextual clues, as is the case in reading.
- The need to recall and use many steps, rules and number facts that require language in calculations and word problems.

Limited comprehension inhibits ability to solve word problems and as mathematics levels increase so do the demands on reading and language skills.

OHPM12

Working it Out

Exercise 3

Aim: to reinforce the need to understand the language of maths and to recognize the need to present new skills in familiar formats.


Translation:

par on caru = put out 3

Par on acka = put out 1

Han muri artoneth = How many altogether.

Working it Out

<input type="text"/>	Par on caru.
<input type="text"/>	Par on acka.
<input type="text"/>	Han muri artoneth.
	
	
	

Method:

- Cut OHP into separate parts.
- Give verbal instruction only from text on OHPM12 top half and ask participants to respond.
- Repeat the process by using gesture. Lead them to put out the correct number of items.
- Show the OHP/presentation top part and elicit the familiar format aspect of the written task.
- Use bottom half of slide and lay over part 1 to give answer to algorithm.
-

OHPM13

Curricular Areas

Generalisation and understanding of the abstract nature of mathematics requires a considerable length of time with structured, concrete, 'real' materials slowly building connections through carefully guided instruction and experiences provided in a systematic and correct order at all stages of concept development. Gradually the pupil will grasp the concept of "conservation" of number; the realisation that five objects, regardless of size, shape colour or arrangement are still counted as five.

Commercially produced materials together with real objects should be used in order to promote the real aspect of the purpose of using mathematics operations. Much more time must be spent at this stage. Manufactured materials although colourful and fun to use are in a sense abstract or unreal since we do not count 'Compare Bears' or 'Peg People' in real life situations. Additionally, commercial materials may inhibit learning, as pupils may prefer to use them as toys rather than as a tool for learning.

Curriculum

Basic numeracy

Concrete materials
Real situations

Calculator skills

Large calculator
Match tasks to levels of attainment

Money

Equivalence of coin values and amounts
Practical activities
Real situations using real coins
Counting on to give change

Time, measure & shape

Concepts and language
Relate to real events and daily schedules
Real objects and activities

Other areas appropriate to individual
interests, learning style and attainment

It is important that pupils realise that there is a real purpose in the use of mathematics and that it is not just an activity that takes place in school but is relevant to real life away from the classroom. It is vital therefore to create real situations with real, everyday objects to count. For instance, counting and giving out pencils or exercise books for the group or setting the table for a given number of people is a useful and real activity that provides opportunities to consolidate counting, one-to-one correspondence, the concept that anything can be counted and that there is a purpose to the count.

Money: Teach rote counting, in 2s, 5s, 10s, 20s, 50s and from numbers other than one. Use these stations to practise counting on to give change since we use 1p, 2p, 5p, 10p, 20p, and 50p.

Rather than focussing upon the equivalence of coins, teach the recognition of coin groups for specific amounts. Matching and categorising similar values made up of different coins will help to lead the student to just intuitively know that $2 \times 1p$ is of the same value as $1 \times 2p$ etc.

Create practical activities for shopping and make them real and meaningful. Look for real opportunities to immerse the student in the concept. It is important to use real situations using real coins avoiding the use of plastic coins.

N.B. Equivalence of coin values and amounts may be unsuccessful

Time: Teach the understanding of concepts, language and processes together. Teach clock times and the understanding of the concept the passage of time.

Create real activities such as events in a typical school day. Focus upon familiar times of the day i.e. what happens before and after; breakfast, coming to school. Use a daily calendar and practise yesterday today, tomorrow, days of the week and months of the year.

Calculator skills: Use a large calculator and match the tasks to levels of attainment. Additionally, use a calculator when the student understands the process but has difficulty with computation. Use also to free the student from the computation and allow him/her to:

- Work more quickly.
- Be motivated.

- Undertake more complex tasks.
- When computation is only difficulty.

OHPM14

Problem solving skills

Lack of critical thinking skills compounds problem-solving difficulties. Time is needed to engage in problem-solving and other maths "thinking" activities beyond the simple practice of computation even before they have mastered computational skills.

Encourage the pupil to:

- Read and understand the problem.
- Look for the key questions and recognise important words.
- Select the appropriate operation.
- Write the number sentence (equation) and solve it.
- Check answers.
- Correct errors.

Problem Solving Checklist

Circle yes or no



I read the problem.	yes	no
I understand the problem.	yes	no
I circled important words and numbers.	yes	no
I am going to add.	yes	no
I am going to take away.	yes	no
I wrote the sum.	yes	no
I checked my answer.	yes	no
I need to correct my answer.	yes	no

Teaching New Skills

Acquiring mathematic skills and concepts depends heavily on previously learned skills. Before introducing any new concept consider existing background knowledge and ensure prerequisite skills are achieved and firmly grasped. Reinforce these skills for several days (or as long as it takes) in order to enable student to recall and use the relevant operations and skills in new or more complex operations.

All reinforcement opportunities should be sufficient for obtaining fluency, distributed over time e.g. regular revisiting of previous skills, cumulative as more skills are learned, and varied to promote generalisation and motivation i.e. doing the same thing in as many different ways as possible.

OHPM15

Learning a new skill

- Acquisition: Beginning to work accurately.
- Fluency: Able to perform skill accurately and fluently
- Maintenance: Continues to perform accurately and fluently over long period.
- Generalisation: Able to apply skill to different tasks.
- Adaptation: Able to apply new skill in new setting without help.

OHPM16

Formal Written Addition and Subtraction

The transition from informal to formal is very gradual. Pupils with DS may encounter difficulty associating informal mathematics knowledge to formal school mathematics. Associations and connections are likely to be made slowly and sometimes mathematics may be perceived as a set of unconnected facts. Making these connections takes time, a variety of experiences, and carefully directed teaching. Worksheets with pictorial representations are semi abstract and purely symbolic. If introduced too early, they can confuse the fragile links being formed between existing concepts, the strange and unfamiliar language of mathematics, and formal written number problems.

The use of structured, concrete materials is important to securing these links not only in the early years, but also during concept development stages of higher-level mathematics. Concrete materials can be held,

Learning a New Skill

Acquisition

Beginning to work accurately

Fluency

Able to perform the skill accurately and fluently

Maintenance

Continues to perform fluently over a long period of time without assistance

Generalisation

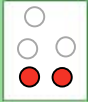
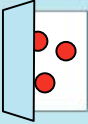
The pupil can now apply the new skill to different tasks

Adaptation

The pupil applies the new skill in new settings without any instruction

Computation

Moving towards formal written subtraction

Find	5			
Hide	3			
How many left?	2			
five	hide	three	leaves	two

moved, grouped and separated, allowing pupils to visualise numerical concepts making them much more real than pictorial representations.

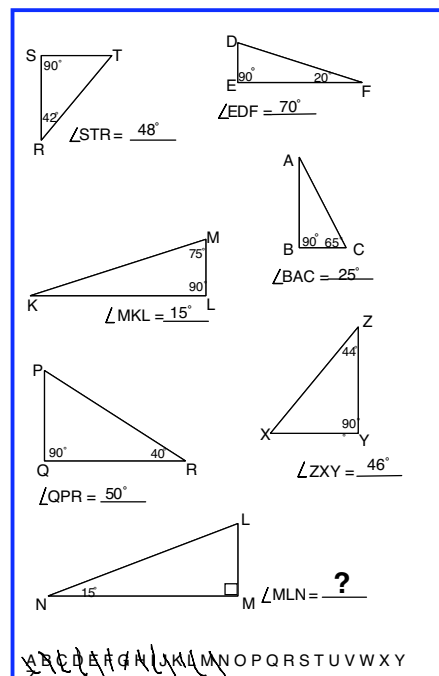
OHPM17

Self esteem

It is critical in teaching any area of the curriculum to look for opportunities to allow students when possible to do the same tasks or activities as their peers. It may well be the case that task will be of no academic benefit and the student will have no understanding of the concept. However, the aim of the lesson would be to allow the student to be the same as others in the class and build his/her confidence and self esteem.

The OHPM17 gives an example of an activity where the student has been taught the process in absence of understanding and set the task of calculating the missing angle, i.e. using a calculator, find the sum of the two given angles and subtract that number from 180.

Self Esteem



Summary

Development is slower. Number developmental stages the same as other students. Accomplishments vary. Motivation is more relevant than IQ or the syndrome label. Teach new concepts in real situations and ensure understanding. Learning should take place in carefully graded steps. Teach the language of mathematics and associated concepts together. Ensure pupils understand what is being asked. Use visual representation of task instruction, demonstration etc.

Tips for Modifying Mathematics Computational Assignments, Salend (1994).

- Reduce the number of problems on worksheets for independent practice.
- Increase the amount of time students have time to complete the assignment.
- Provide adequate space for students to write out solutions.
- Follow a standard format for developing worksheets.

- Cut the worksheet in halves or quarters requiring students to complete one section at a time.
- Assign only odd or even problems.
- Highlight the operation to be performed.
- Move gradually to increasing the number of problems (not more than 20 problems) and decreasing the amount of time to complete the assignment.

References

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Section 6

Behaviour Management

Behaviour Management

OHPB01

Managing Behaviour

It is important to be aware that behaviours that are generally recognised as inappropriate within the school environment are not necessarily about 'being naughty'. In fact they may be the result of factors that are beyond the student's control. Behaviours that do occur are mainly the result of one or both of two key factors.

OHPB02

Triggers and Maintenance

Firstly, the relationships that are present between the student and his/her peers, the school staff and any other professional or visitor can be either the trigger for the behaviour or the maintaining or sustaining factor. It is important to note that teacher behaviour accounts for approximately 30% of student behaviour. Secondly, situations such as:

- The seating arrangement.
- The noise level in the classroom in specific areas of the school or playground.
- The suitability and relevance of the content of the curriculum.
- The timing or pacing of lessons.
- Appropriateness or relevance of instruction.
- Unrealistic expectations - over/under-estimation of ability.
- Over-protection and learned helplessness.
- Insufficient knowledge about the student, i.e. learning style, likes, dislikes, etc.

Managing Behaviour

Problems

Unrealistic expectations

Over or under estimation of potential
Over support when independence is the main aim
Over-dependence on LSA
Insufficient relevant information about the child

Behaviour takes place in situations

Seating arrangement Level of differentiation
Inappropriate curriculum Noise level

Behaviour takes place in relationships

Peer relationships Teacher/pupil relationships
Adult behaviour

Teacher behaviour accounts for 30% of pupil behaviour

Triggers & Maintenance

people
+ situation

= behaviour

0 people
+ 0 situation

= 0 behaviour

All of these are all critical to the frequency and prevalence of specific behaviours.

OHPB03

Observation

Before dealing with any behaviour it is important to identify what precipitated it, what actual behaviour took place, what the child gained from it and how those involved reacted. Observation provides the opportunity to stand back from the situation and really see what is happening. Those involved can use shared observations to clarify the aspects of good and undesirable behaviour, to whom it is directed and identify patterns and triggers. Observation provides an accurate record from which a preliminary base line or 'bench-mark', for planning a behaviour management programme.

Observation

Objectivity:

Stand back outside the situation
See what is happening but not caught up in it
Shared observation clarifies aspects of behaviour

Clarifies:

Aspects of good and undesirable behaviour
To whom it is directed
Identifies patterns or triggers

Benefits:

An accurate record
Preliminary record and base line for planning
An important preventative skill.
Promotes pre-emptive techniques - 'nip in the bud'

Takes time but worthwhile and revealing

An independent observer is best. Using a few sessions of general observation of the student in class he/she can obtain an overall picture of the individual's way of dealing with other students, adults, attention span and so on. Discreetly observe for short periods (15 mins.) at different times of the day. Sit at the side of the class or at a table with other students avoiding being too near to the student being observed. Look for patterns or particular behaviours worth focussing upon. Use an observation checklist that is an easy way to record and write notes in longhand or in your own code. Making informal observation is an important preventative skill that allows you to 'nip situations in the bud' and to help the child to benefit more fully from the educational opportunities. Observation **does** take up time but it **does** pay off and can be very revealing.

Observe and note:

- Who the student sits next to, who he/she speaks to and how they react.
- What happens when the student moves around the class.
- Take note of the amount of time spent on and off-task.
- Identify what exactly the activity is if not on-task.
- Take note of the concentration levels.
- Any unusual, irritating or disruptive behaviours.
- The level of noise in the class.
- What happened prior to create the behaviour.

What were the consequences of the behaviour.

Use the A - antecedent B - behaviour C - consequence strategy to identify:
Any common factors, patterns to the behaviour and hierarchies of behaviours.
What sustains, maintains the behaviour.
What in relationships and situation contributes to the problems.
Does the student understand class rules?

OHPB04

Detailed Observation

The following three techniques can be used to observe behaviour more closely. The technique used will depend on the type of behaviour being observed.

1. Event Recording:

This is useful for a behaviour that has a clear beginning and end, e.g. throwing pencils, annoying another student. Make use of a 'frequency count', using tally counters or marks (gate system). Carry out the recording at short periods throughout the day and note patterns in the behaviour and follow up with a detailed written record of the event - 'ABC' recording.

- A. = The antecedents; what led up to i.e. triggered the behaviour.
- B. = The specific behaviour displayed.
- C. = The consequences, what did the student gain and what were the reactions of others.

2. Duration Recording:

This is appropriate for persistent behaviour tantrums or wandering. Time the length of the tantrum or wandering and note its duration. It will provide a base line for a programme to reduce/eliminate the behaviour. Make a note of the antecedents and the consequences and use in later planning.

3. On-Off Task Recording

Make use of this when concentration span is short and there is a tendency to disrupt others. Watch the student during a work session and note whether he/she is doing what has been asked. Activities set by the teacher are called 'on-task'. Other activities are known as 'off-task'.

Detailed Observation

Event recording

Behaviours with a clear beginning and end

Duration recording

Persistent behaviours

On-off task recording

Short concentration span

Diary

Informal observation

Intuitive knowledge

Playground behaviour

Use:

- Time sample: Using a stop watch observe the student 5 minutes every half-hour during a work session. Check total 'on-task activity during the 5 minute period.
- Fixed sample: Note taken every 2 minutes during work session. Record whether student is on or off-task at that instant. Keep a close eye on the clock for this one. Record sheet with on and off task columns can be used.

Playground Observation

The freer environment of the playground is more difficult to deal with and behaviour can often pose more of a problem here. Note friendship patterns and social relationships not apparent in the classroom. Note the antecedents, behaviour and consequences and identify reason for the behaviour. Note who plays with the student and who does not. Watch carefully how the student approaches other students. Record how the student joins in games and consider how other students react away from adult influence. Note whether the student has difficulty playing with other students, *(indicative of the need for adult help to learn how to play)*.

On-Going Observation

Develop a relationship with the student. As you work, watch the student carefully and keep a diary. Observation skills, once developed:

- Helps a busy teacher in many ways, e.g. a classroom auxiliary may be the first to observe a change of behaviour in an otherwise settled student.
- Provide staff with information about who works well, with whom, and the speed and ease with which various tasks are completed.

OHPB05

Eliminating Inappropriate Behaviour

The most effective means of eliminating inappropriate behaviour is to make use of positive reinforcement. Make use of what is known as the 'praise-ignore attention rule'. The object of this method is that the student will eventually unlearn the unacceptable behaviour. Since students will work for attention from others, especially adults, purposely ignore undesirable behaviour, and while paying particular attention to desirable behaviour. Catch the student out in 'good behaviour', praise, encourage and reward immediately. From this he/she will learn that certain behaviours have pleasant consequences and certain others do not. Those with pleasing outcomes will be repeated therefore it is important to make only the good behaviour worthwhile.

Eliminating Undesirable Behaviour

Positive reinforcement

Some behaviours have undesirable consequences

Unlearning unacceptable behaviour

Ignore the undesirable behaviour
Behaviour ignored is discontinued

Some behaviours have desirable consequences

Learning acceptable behaviour

Make good behaviour worthwhile

Reward desired behaviour - praise & encourage
"Catch the child out in good behaviour"

Behaviour reinforced re-occurs

Reinforcers

Tangible rewards
Social rewards
Self-reinforcers.



OHPB06

Praise Ignore Attention Rule

Affection, trust and respect for adults promotes a desire to please. Adults' rewards and sanctions are a more powerful influence on behaviour, therefore reinforce desirable behaviour by giving:

- Tangible rewards - sweets, treats, pocket money.
- Social rewards - attention, smile, pat on the back, word of encouragement.
- Self-reinforcers - setting and monitoring own behaviour self-praise, self-approval, a sense of achievement.

N.B. Behaviour good or bad that is reinforced tends to re-occur.

Praise Ignore Attention Rule

Appropriate behaviour
+ Reinforcement (reward)
= More appropriate behaviour

Appropriate behaviour
+ No reinforcement
= Less appropriate behaviour

Inappropriate behaviour
+ No reinforcement
= Less inappropriate behaviour

Inappropriate behaviour
+ Reinforcement (reward)
= More inappropriate behaviour



OHPB07

Learning by Example and Experience

Generally children and adults learn social behaviour by imitation and modelling behaviour on significant people. They will copy what is heard and said. There is however, a negative side as they are just as likely to imitate inappropriate behaviours. It is therefore important for students to have good role models. If we place children with Down's syndrome or others with significant disabilities within lower ability where they are among poorly motivated peers with unacceptable behaviour, these are the behaviour patterns they will learn. Teach new patterns of behaviour. Create

opportunities to observe desired behaviour by placing them in higher ability classes where they can work alongside well behaved and highly motivated class members. Peers with a positive attitude to school work are also less likely to laugh at silliness or encourage the child with Down's syndrome to misbehave, which will encourage the student to stay on task.

Learning by Experience & Example

Observational learning

Child learns social behaviour by imitation
Model behaviour on significant people
Do what is heard and said
Negative side: imitate inappropriate behaviour
Allow opportunity to observe desired behaviour

Natural consequences

Effective means of modifying own behaviour
Within limits, allow child to experience
consequences of own actions

- Antecedent** - Student having lunch
- Behaviour** - Misbehaving and does not finish
- Consequence** - Given one warning - ignored
Time out - Lunch removed
goes hungry



Natural consequences

Effective means of modifying own behaviour. Within limits, allow the student to experience consequences of own actions, e.g. student breaks favourite possession, it is not replaced he/she and learns to be less destructive.

Antecedent - Student having lunch

Behaviour - Carrying on and does not finish on time

Consequence - Single warning ignored. Time runs out and lunch removed and student goes hungry

OHPB08

Responding Positively

Avoid "YOU" messages; "You silly child", "You are very bad." blames the student and validates feelings of low esteem and low self-image. Instead, use "I" messages which have three components.

- The behaviour
- The effect
- The feeling

The "I" messages communicate feelings and reduce confrontation. They provide the chance for discussion and protect the self-confidence of the student. The adult can stay calm and express feelings.

A good way to start the "I" messages is to begin them all with "When you" to describe the behaviour.

- "When you" - The behaviour.
- "It makes me....." - The effect.
- "and I feel" - The feelings.

Label the act not the person

The less desirable behaviour will lessen or disappear. The behaviour that receives attention will increase.

OHPB09

Management Strategies

It is important to recognise that not all behaviour is attributable having a particular disability. For example, there is a common misconception that inappropriate behaviour is attributable to having Down's syndrome. This is not the case. Personality and interaction with peers and adults have a greater impact on behaviour. No two students are the same. In other words, each person is an individual with his/her own particular personality.

Responding Positively

Avoid "YOU" messages:

"Stupid boy" "You are very bad."
Blames child and promotes low self image

Use the "I" messages

They have three components.

1. The behaviour
2. The effect
3. The feeling

The "I" messages allow you to:

Communicate feelings & avoid confrontation
Protect self-concept of the child

The "I" message:

Label the act not the child

"When you"	-	The behaviour
"It makes me....."	-	The effect
"and I feel"	-	The feelings



Management Strategies

Not all behaviours are attributable to DS

Personality plays a part
No two children are the same

Affection is a premium for learning

Show you like the child
Remove the threat of failure
Take the blame

Build relationships

Share stories	Always keep a promise
Use child's name	Use the 'I' messages
Talk to the child in a positive way	

Bypass strategies

Pre-empt situations
Be consistent
Provide structured events

Although some concessions need to be made for students' emotional immaturity, expectations of good behaviour should remain high. Students with Down's syndrome or any other disability should never be allowed to get away with disruptive or dangerous behaviours just because they have special needs.

Children and teenagers respond well when they like and respect adults. Affection is a premium for learning therefore show that you like the student. Be aware of feelings, particularly of low esteem and sensitivity to failure. Remove the threat of failure by taking the blame yourself.

Build relationships by using a student's name during conversation. Share stories of your family, friends, pets etc. Express surprise when they do something wrong and make use of humour, i.e. find jokes or things that make them laugh. Find their own special interests and provide newspaper articles and books. When appropriate find special jobs/responsibilities for the student. Use occasional and casual but appropriate physical contact but be aware that some students may not like physical contact. Maintain a reassuring attitude and ALWAYS keep a promise. Once a relationship is beginning to establish explore ways to maintain and use.

Picking up signals

Be aware of signals and behavioural warning signs and intervene at an early stage to prevent the behaviour from deteriorating. Be aware of signals of distress as disturbance may be non-verbal - a look in the eye or body movement. Early observations teach you particular movements precede a tantrum. Make use of distraction by engaging in an enjoyable activity.

Be aware of mood/attitude at outset of day. A downcast appearance or a refusal to make eye contact etc. and find out whether the student is feeling angry or frustrated. Identify the cause - lack of sleep, home situations or incidents. Be sensitive to moods at other times such as after lunch when they have been participating in an activity away from you or before they go home. Spend some time with the student encouraging him/her to talk through his/her feelings. Again prevent the behaviour from deteriorating. Make use of by-pass strategies such as:

- Preferential seating, who the student sits beside.
- Use of educational software.
- Provide legitimate activity when student has difficulty attending.
- Be prepared for events where student may be over excited.
- Pre-empt situations by creating a diversion.
- Consistency of expectation, action reward and punishment.
- Structured events leading from the aim of lesson to its achievement.
- Display pictures or lists of acceptable behaviours will serve as a reminder.
- Rules should be clearly spelled out and reinforced regularly basis.

Helpful Dos and Don'ts

Do:

- Talk to the student in a positive way.
- Get down to student's eye level. Make eye contact. Use his/her name and speak firmly and politely.
- Remove the threat of failure and admit that the work may be difficult and encourage student to have a go.
- Be prepared to take the blame when a student fails... "It's my fault, I didn't explain it properly."
- Intervene while a student is on task - easier to correct before the task is finished.
- Be a good role model. Apologise when late, unwell or irritable.
- Praise the student. A gesture, smile, pat, are as effective as words.
- Touch combined with praise can positively affect behaviour.
- Be aware that some students do not like public praise do privately initially.
- When a student is producing worrying or disruptive behaviour make a note of, and comment on some positive part of the behaviour.
- Distracting a student who is beginning to get steamed up may relieve the situation.
- Anticipate their behaviour when you know they get worried/anxious about certain things.
- Prepare student and forewarn of events, which may be problematic or distressing.

Don't:

- Concede to the behaviour to avoid an unpleasant outcome.
- Give too many commands.
- Use vague requests: "Why can't you stop it?" instead of "Please stop that!"
- Call out commands from a distance.
- Criticise too many minor demeanours - endless trivial confrontations.
- Time requests insensitively.
- Scold, nag or reason at the wrong time.
- Discuss undesirable behaviour at a great length.
- Let student get away with' misbehaviour.
- Allow threats to be unfulfilled.
- Continue to issue a stream of orders until anger mounts.
- Convey 'messages' wittingly or unwittingly, that you dislike the student.
- Find little time to share enjoyable moments (playing with student).

Remember!

Defiant behaviour will be maintained through getting his/her own way.

Student may reward the adult for the attention by being cooperative.

Student's coercive response to adult's insistence can create mutual reinforcement of behaviour.

Penalise consistently for failing to achieve desired behaviour.

Consistency reduces the need to apply penalties since the student believes the threat.

Management Principles:

- Parents may feel very anxious defensive about behaviour problems.
- Structured, well-organised lessons.
- Calm atmosphere in class.
- Be assertive, avoid anger, your actions are role model.
- Establish a clear and unbiased, unemotional view of the problem.
- Use time out in a positive way.
- A few rules positively stated and displayed.
- Be aware of difficult times of the day and unusual events.
- Like the student, but not the inappropriate behaviour.
- No two students have the same strengths & weaknesses.
- There is no such thing as a 'Down's syndrome student'. The term used should be, 'a student with Down's syndrome'.
- Note good behaviour and positive achievements.
- Sort out the 'I won't' from the 'I can't'.
- Praise efforts and explain why you are pleased.
- Positive reward system.

Preparing an Behaviour Modification Strategy

Clarify the Nature of the Problem:

- List student's strengths.
- Identify how and what the student learns.
- Ability to learn.
- Keep a diary of difficult behaviour; clear, non-emotional entries.
- Note frequency of unwanted behaviours.
- When and how it started.
- Note when and where the behaviours mostly occur.
- How the student reacts.
- How peers are affected.
- Identify possible underlying causes of the problem.
- Identify factors that contribute to the problem.

Setting and Monitor Objectives

- Define precise problem behaviours.
- Prioritise problems.
- Decide on educational strategies.
- Set clearly stated targets. (*Marcus will attend during story time and not touch other students or speak*).
- Set measurable attainable targets. (*Alison will attend for a 10-minute story period*).
- Determine the starting point.
- Specify strategies.
- Measure progress.
- Monitor and review the situation.

Modification Plan

Aim:

To encourage a single targeted, desirable behaviour by rewarding the student each time it is displayed.

Objective:

Student understands the consequences of his behaviour and associates it with reward.

Materials:

Wall chart and happy faces velcro-backed or blue-tack made easily accessible (in teacher or learning support assistant's pocket, not accessible to student).

Rewards

Badges Wall charts Stickers Reward cards Everyday rewards.

Method:

Discuss the behaviour and the reward system with the student. Reward desired behaviour instantly and without a great fuss. At regular intervals note the targeted behaviour and reward him/her with happy face on a wall chart and give a quick word of praise. Concentrate on the times when the he/she is being good and less on the times when he/she does not conform to an acceptable standard.

If problems persist, share your concerns with the parents and develop a behaviour management strategy. Enlist the support of an LEA advisory teacher or psychologist. Don't assume that the only solution is to move the child to a special school.

Recommended Reading

Alton, S. (1998) Children with Down's Syndrome - Behavior Information Sheet, Down's Syndrome Association.

Bryan, J. (1998) Living with Down's Syndrome, Hodder Wayland.

Newton, C (1999) Circles of Friends, Folens.

Section 7

Appendices

Appendix I

Down's Syndrome - An Overview

Down's Syndrome

This was first described in 1866 by an English doctor, John Langdon Down. A 'syndrome' means a group of recognisable characteristics occurring together.

Down's syndrome is a condition that is present at birth. It cannot be caught and randomly affects approximately 1 in 700 live births.

OHP Trisomy 21

Trisomy 21

This is the most common form of Down's syndrome and it accounts for 95% of cases. It is a chromosomal accident prior to conception when the egg and sperm are formed. The child with Down's syndrome will have an extra chromosome 21 in every body cell.

Mosaic Down's Syndrome

This accounts for 1% of cases and occurs in a similar way to Trisomy 21. But after conception not every cell in the body is affected. The degree of learning disability that a person has may sometimes, but not always, be lessened.

OHP Translocation

Translocation

This accounts for 4% of cases and occurs when a part of chromosome 21 is joined on to another chromosome. Babies born with this condition have 46 chromosomes and not 47 and one of the chromosomes is larger because it carries an extra part. Sometimes this form of Down's syndrome may be hereditary.

Recognising Down's Syndrome

People with Down's syndrome have some features in common but more closely resemble their parents and family. Each person is an individual with a unique appearance and set of abilities. They should not be categorised as a group.

Characteristics

Down's syndrome is recognizable at birth and many characteristics are attributable to the syndrome. However, an individual child may have only some of these. There are certain common facial features e.g. a rounded face with a flattish profile, eyes mostly slanting upward with the

'epicanthic fold', a small fold of skin often present at the inner corner of the eye. Occasionally there may be small white specks in the iris called 'Brushfield spots'. Neither of these affects the vision.

The head is often smaller than average caused by underdevelopment of the facial bones and the back of the head may be slightly flattened with the neck appearing shorter than normal. Generally, babies have a smaller than usual mouth with a flattish palate giving less tongue space. This together with weakened tongue and jaw muscles can make the tongue protrude.

Often arms and legs are shorter in relation to the body. Hands tend to be broad with short fingers. The little finger may have one joint instead of two and curve in towards the other fingers. The palm may only have one crease. Feet generally tend to be broad also with a short space between the big toe and the second.

Low muscle tone, 'hypotonia', is another common feature. It is more prominent in the early years when the child may feel floppy. Additionally, the child may be loose jointed, 'hyperflexibility'. This improves with age and is seldom a problem during adolescence.

Newborn babies tend to be light at birth and may not make rapid gain in weight. The body length may be shorter than average. Growth is usually slow but steady. Separate height and weight charts specifically for children with Down's syndrome should be used.

OHP Characteristics

Associated Conditions

Auditory impairments

Young children with Down's syndrome have narrow ear and nasal passages causing congestion and ear infections. 80% of children experience hearing loss due to an accumulation of fluid in the Eustachian tubes often described as 'glue ear'. Treatment sometimes involves the insertion of tiny plastic tubes or 'grommets' in the ear drum which help to drain off the fluid. However more recent treatments tend to favour the use of a hearing aid instead.

Visual impairments

Long or short-sightedness or squints caused by an imbalance between the eye muscles or by defective vision in one eye causing a 'lazy eye' may occur. Nystagmus, a jerky movement of the eye due to poor muscle coordination may be present. Cataracts can occur but tend to be rare in the early years.

Skin

Dry flaky skin, which may crack or itch is common. Weather and frequent use of soap and water can exacerbate the condition.

Less Common Conditions

Gastro-intestinal (bowel) complaints

Duodenal Atresia the complete blockage of the short part of the bowel, which affects 10% of babies, is recognizable at birth and treatable by surgery.

Hirschsprungs disease, the partial blockage of the bowel is a rare occurrence and is caused by a lack of certain nerve cells in the bowel wall preventing regular and easy emptying of the bowel. Symptoms are vomiting, constipation and dramatic distension of the abdomen. It is treatable by surgery.

Thyroid Gland Underactivity

Hypothyroidism is a deficiency of the hormone 'thyroxin' produced in the thyroid gland in the neck. It is detected in newborn babies by the 'Guthries' blood screening test. Older children and adults may be affected and have no obvious symptoms. Consequently, regular blood tests are important and advisable. Correct thyroxin levels are crucial to mind and body functioning.

Leukaemia

Cancer of the white blood cells occurs in approximately 1 in 100 children with Down's syndrome and its onset is likely to be between the ages of 1 and 4 years. Symptoms are skin pallor, bruising and general malaise.

Cervical Spine Instability

Atlanto-axial instability occurs in 10- 20% of children where the 'peg' of the vertebrae is creating increased mobility of the joint between the two bones, (the Atlas and the Axis), directly under the skull. In extreme

cases this can cause dislocation of these bones, leading to neurological symptoms such as altered sensation in the fingers and hands or occasionally paralysis. There is currently no screening procedure that can predict the condition and x-rays are at present unreliable.

Symptoms of cord compression are, neck pain, restricted neck movement, unsteadiness of gait and deterioration in the bladder and/or bowel control. Should these symptoms occur urgent medical attention is crucial. The condition is treatable.

Children and adults with Down's syndrome should not be excluded from normal sporting activities since there is no evidence that participation in sport increases the risk. In fact regular exercise should be encouraged. However, intense sporting activities that apply extreme pressure in this area should be avoided.

The Heart

About 1 in 3 children with Down's syndrome have a heart defect. Because it is present at birth it is called congenital heart disease. If no problem is detected in early years it is unlikely to develop later on.

Types of Congenital Heart Disease

Atrio-ventricular Septal Defect, (AVSD), is the most common heart defect occurring in 1 in 6 children. It is a hole between the two atria and occasionally between the two ventricles as well. It is correctable by surgery.

Persistent Ductus Arteriosus, (PDA), occurs in 1 in 50 children with Down's syndrome. An open duct above the heart allows excess blood to flow into the lungs. It is correctable by surgery.

Tetralogy of Fallot only occurs in 1 in 100 children with Down's syndrome. This is a combination of four heart defects. Repair involves a complex open-heart operation. Total correction is difficult in infancy and temporary repair is carried out until the child is older.

Precautions should be taken when a child or adult is undergoing any operation, i.e. drilling or extraction of teeth may allow bacteria to enter the bloodstream causing an infection in the heart. Dentists should always be informed of any heart defect to enable antibiotic cover to be arranged.

The Growing Child

At birth it is impossible to predict any child's potential. There is certainly no relationship between the number of physical characteristics associated with Down's syndrome and cognitive ability.

Health care is critical in promoting the child's potential. Hearing and visual defects regardless of how minor can impact upon the child's learning, language development and social interaction and development of social skills.

Assessment and evaluation should be carried out by a trained speech and language therapist who will advise on a 'Total Communication' approach which involves the use of formal signing using systems such as 'Makaton' or 'Signalong', alongside speech. To avoid confusion, be consistent and ensure all involved with the child are using the same strategies.

A warm secure environment within the home and school is important. Children with Down's syndrome develop and learn throughout life. They go through the same developmental stages as their typically developing peers but at a slower pace. There may be times when the child appears to have reached a plateau. In fact, this may be due to one or a combination of the following:

- A. A period of consolidation has occurred where the foundations are being laid for the next stage.
- B. The child has been held at the same level for too long and has lost interest.
- C. There is no variation in the presentation of teaching or tasks.
- D. The work is beyond the child's capability.

Children with Down's syndrome do not have particular behaviour problems. Difficulties that do occur are similar to those in other children. However, they are likely to appear later and be related to the developmental age rather than the chronological age of the child. As with all children, sensitive handling by focusing and rewarding good behaviour and in some situations ignoring the unacceptable behaviour is the most effective method.

Growing Up

Puberty

The physical changes that occur during puberty do so at about the same age as their peers and follow the same pattern. However, for teenagers with Down's syndrome the changes occur when the individual is less cognitively mature and this may cause problems.

Increased hormone levels in the blood during puberty may cause changes in behaviour. Teenagers may become more tired, listless, more irritable and defiant. Professional advice may help during this period and can help to prevent behaviour problems. Being prepared and dealing with problems early prevents behaviours becoming entrenched.

Puberty is a period of rapid growth, marked also by an increased appetite. Obesity may become a problem and once thyroid deficiency has been eliminated a healthy diet together with plenty of exercise should be encouraged. Inclusion in sporting and leisure activities are important during adolescence both for keeping weight down and providing opportunities for social interaction.

Adolescence

Young people with Down's syndrome experience the changes associated with puberty at around the same time and in the same order as other young people. However, they may be less emotionally mature than their peers and therefore need extra support and reassurance to cope with the physical changes.

Preparation through effective and appropriate information will be vital in helping the young person with Down's syndrome to understand what is happening to their body. It is also essential that the young person is made aware of the range of emotions that are often experienced throughout this time of change. Awareness and training about personal hygiene, relationships and appropriate behaviour will equip young people for adulthood.

This is often the time when young people realise how having Down's syndrome affects them. A positive self-image is very important for all young people and therefore clothing and hairstyles should be up to date in addition to having opportunities to lead an active social life, doing the

things that young people enjoy doing. Young people with Down's syndrome need to have chances to increase their independence from their parents, this allows them to start making choices and to take responsibility for their actions, as well as increasing their skills and confidence.

Young people with Down's syndrome want to lead the same kind of lifestyle as other people - having the same choices and opportunities as everyone else.

Appendix II

Workshop Activities

Workshop Activities

Background

It is September and Marcus is in S1 experiencing secondary education for the first time. He is a very capable and independent boy who has been encouraged by parents to do things for himself.

The family regularly go out at weekends to the local shopping centre where Marcus is given the freedom to go where he pleases and given a time and place to meet up at the end of the day. His parents assured the school that he is very safety conscious and would be unlikely to put himself in danger. He is capable of crossing roads and finding his way home. The parents and the Education Psychologist are in agreement that he will come to no harm within the school both internally and externally.

The primary school promoted independence and he worked with minimum 1:1 support. Head teacher found him to be fiercely independent and strong-willed but manageable. They had few problems.

Secondary school insists upon total 1:1 support and his personal assistant is velcroed to him in every class.

During observation it was noted that throughout his 1:1 support he continually requested the learning support assistant to leave, stating, "Go away." And, "Do it myself." Throughout the lesson he continually physically elbowed or pushed her away and eventually ran from the room. During his absence several pupils came frequently to the support base to report his whereabouts.

The school policy on obeying rules is very strict. They maintain that the rules apply to all pupils and that allowances cannot be made for any pupil regardless of disability. They are of the opinion that if pupils are to be included and treated in the same way as their peers then there should be no concessions.

Scenario 1.

First term S1. Student with Down's syndrome has discovered the lift and is continually using it although it is against the school rules. The lift is to be used only by disabled students. No one can get him to stop going into it. He sees himself as the lift operator. On each occasion the boy is sitting on the floor sporting a satisfied grin. The behaviour has escalated from simply using the lift, to playing in the lift, to finally setting off the alarm in the lift. The majority of the staff are outraged and consider this to be the most heinous of crimes.

Task: Use the ABC analysis to determine:

Why is the behaviour escalating?

How could this situation have been avoided?

What strategies would you employ to eliminate this behaviour?

A

B

C

Conclusion

Which of the behaviours from the scenarios discussed do you consider to be a priority?

How would you set about eliminating all of these behaviours?

Scenario 2.

Student regularly 'does a runner' from the class and wanders the school. LSA takes up the chase. He always looks back to see who is following. The alert is sounded and several members of staff are deployed to round him up. There is a great hue and cry and much beating of breasts over each escapade. This behaviour is repeated time and time again. School maintain that they have to get him back in case he climbs the railing at the top of the stairs and falls.

Task: Use the ABC analysis to determine:

Why is this behaviour being repeated?

Could this situation have been avoided and if so, how?

What strategies would you now employ to eliminate this behaviour?

A

B

C

Conclusion

Which of the behaviours from the scenarios discussed do you consider to be a priority?

How would you set about eliminatiing all of these behaviours?

Scenario 3.

There is a rule that pupils must not walk on the grass surrounding the school building. Marcus will not stay off the grass and appears to do so deliberately and daring other pupils to report him.

Task: Use the ABC analysis to determine:

What type of behaviour is this?

Could this situation have been avoided and if so how?

What strategies would you now employ to eliminate this behaviour?

A

B

C

Conclusion

Which of the behaviours from the scenarios discussed do you consider to be a priority?

How would you set about eliminating all of these behaviours?

Appendix III

Resources

Maths Vocabulary

Problem solving Checklist

Worksheet Tips

Behaviour Checklist

Behaviour Record Sheets

ITC Resources

Teaching Resources

Maths Vocabulary and Concepts

Using and applying maths:

Results, outcome, check, explain, record, make, test, predict, prediction.

Handling Data:

Sets, maps, diagrams, data collection, methods of recording data, for example, tables, lists, charts, graphs

Money:

Coins, how much, how much altogether, cost, price, change, and all units of measure.

Colour:

Words for colours, shade, dark, light, darker, lighter, pale, clear, opaque.

Fractions:

Same, different, as big as, smaller than, larger than, greater than, whole, piece (of the.....), part, complete, half, halves, equal, unequal, quarters, one quarter, two, quarters, three quarters, one half

Number and algebra:

a lot, all, some, both, another, not any, many, same, more, less, every, enough, as many as, first, second, third.... last, add, subtract, take away, guess, estimate, two times, multiply, units, tens, hundreds, repeating pattern, odd, even.

Spatial Relationships:

In, on, under, by, beside, behind, in front of, next to, over, through, inside, outside, out, to, off, above, below, round, up, down, front, back, left, right, forwards, backwards, top, bottom, middle, first, last, next

Time:

again, now, after, soon, today, before, later, yesterday, early, late, once, tomorrow, twice, quick, slow, first, next, last, days of the week, weeks in a month, months of the year, time telling: quarter past, quarter to, units of measure seconds, minutes, terminology, o'clock, half past, hours, days, weeks, months, years, etc.

Shape:

Round, dot, spot, line, circle, rectangle, square, hexagon, pentagon, oval, triangle, diamond, and other two dimensional shapes, three dimensional shapes; sphere cylinder cuboid, pyramid, etc., properties of shapes; curved, rolls, flat, face, corner, edge, side, straight, right angle, turning, flip, symmetry, clockwise, anti-clockwise.

Area, volume, capacity:

a lot, lots, a little, a bit, a small bit, empty, full, much, most, more, more than, less than, same, and all units of measure

Area, volume, capacity:

a lot, lots, a little, a bit, a small bit, empty, full, much, most, more, more than, less than, same, and all units of measure

Size width, height, length:

big, small, little, fat, thin, long, short, thick, wide, narrow, comparative and superlative forms of words, as big as , longer than, shorter than, order, compare, all units of measure.

Weight:

Heavy, not heavy, light, heavier than, lighter than, heaviest, lightest, and all units of measure

By kind permission

Sue Buckley & Gillian Bird

Problem Solving Checklist

Circle **yes** or **no**

I read the problem	yes	no
--------------------	------------	-----------

I understand the problem	yes	no
--------------------------	------------	-----------

I circled important words and numbers	yes	no
---------------------------------------	------------	-----------

I am going to add	yes	no
-------------------	------------	-----------

I am going to take away	yes	no
-------------------------	------------	-----------

I wrote the sum	yes	no
-----------------	------------	-----------

I checked my answer	yes	no
---------------------	------------	-----------

I need to correct my answer	yes	no
-----------------------------	------------	-----------

Tips for preparing worksheets for pupils with DS

Method

Use meaningful material that is within, or close to, the pupil's own experience.

Introduce new concepts in familiar context.

Make the tasks self-contained.

Provide plenty of visual cues - pictures, diagrams and print.

Provide plenty of opportunities for success.

Use pupil feedback, behaviour etc. to determine whether or not the written task sheets fulfill your educational aims and objectives.

Supplement instruction and tasks with a taped version which can be replayed for reinforcement.

Experiment with different versions of a written task sheet.

Presentation

Differentiate clearly between text and illustrations.

Leave a wide border all round the edge of the page.

Highlight and explain all key words.

Illustrate new words if necessary.

Avoid handwritten worksheets and instructions - use wordprocessor.

Use subheadings to separate and organise written sheets.

Avoid confusion by using simple and uncluttered layouts.

Break up continuous text.

Use illustrations.

Ensure the illustrations or diagrams tie in closely with text.

Highlight instructions e.g. in a box or by a selected font or colour.

Use coloured as well as white paper - for variety and/or coding.

Language

Use simple and familiar language.

Keep sentences short and concise.

Avoid ambiguous words.

Use active rather than passive verbs.

Behaviour Checklist

	Yes	No
1. Attention seeking?		
a) Have they had a support assistant on hand at all times?	<input type="checkbox"/>	<input type="checkbox"/>
b) Do they object when the assistant helps others?	<input type="checkbox"/>	<input type="checkbox"/>
c) Have they been used to getting special treatment?	<input type="checkbox"/>	<input type="checkbox"/>
d) Have they successfully used attention-seeking behaviours as avoidance?	<input type="checkbox"/>	<input type="checkbox"/>
e) Do they enjoy being the centre of attention?	<input type="checkbox"/>	<input type="checkbox"/>
2. Angry or frustrated?		
a) Do they want to be the same as everyone else and not allowed to?	<input type="checkbox"/>	<input type="checkbox"/>
b) Are they unable to do the things that others can do?	<input type="checkbox"/>	<input type="checkbox"/>
c) Are they being teased or bullied?	<input type="checkbox"/>	<input type="checkbox"/>
d) Are other people impatient or unable to understand what they want?	<input type="checkbox"/>	<input type="checkbox"/>
e) Do they adapt to different ways of working in different classes?	<input type="checkbox"/>	<input type="checkbox"/>
3. Confused or uncertain?		
a) Are they unsure what they are expected to do?	<input type="checkbox"/>	<input type="checkbox"/>
b) Have they forgotten verbal instruction?	<input type="checkbox"/>	<input type="checkbox"/>
c) Are they confused by different rules for different lessons?	<input type="checkbox"/>	<input type="checkbox"/>
d) Are there unrealistic expectations of the student?	<input type="checkbox"/>	<input type="checkbox"/>
e) Have there capabilities been over or under estimated?	<input type="checkbox"/>	<input type="checkbox"/>
4. Need to exert control?		
a) Do they refuse to cooperate on principle?	<input type="checkbox"/>	<input type="checkbox"/>
b) Are they given few opportunities to choose their own activities?	<input type="checkbox"/>	<input type="checkbox"/>
c) Do they feel under pressure and need a break?	<input type="checkbox"/>	<input type="checkbox"/>
d) Do they resent being withdrawn from class?	<input type="checkbox"/>	<input type="checkbox"/>

5. Lack maturity?	Yes	No
a) Is their behaviour more appropriate for a younger student?	<input type="checkbox"/>	<input type="checkbox"/>
b) Do they lack age appropriate social skills?	<input type="checkbox"/>	<input type="checkbox"/>
c) Has immature behaviour been ignored or reinforced in the past?	<input type="checkbox"/>	<input type="checkbox"/>
d) Lack social skills as result of continual 1:1 support?	<input type="checkbox"/>	<input type="checkbox"/>
e) Have they been over supported/protected in the past?	<input type="checkbox"/>	<input type="checkbox"/>

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Stephanie Lorenz

Record chart

Name: _____
Week beginning _____



Behaviour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
I am going to							
Morning							
Afternoon							
Evening							
I am going to stop							
Morning							
Afternoon							
Evening							
Awards total							
My target awards next week will be:							

Record chart

Name:

Week beginning

Behaviour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Target behaviour to encourage and praise							
Morning							
Afternoon							
Evening							
Target behaviour to discourage							
Morning							
Afternoon							
Evening							

Behaviour Frequency Chart

Name

Week beginning

Target behaviours:

1. _____
2. _____
3. _____

Symbol:

Behaviour Frequency Chart

Name

Week beginning

Target behaviours:

1. _____
2. _____
3. _____

Symbol:

	Mon	Tues	Wed	Thur	Fri	Sat	Sun
6-8am							
8-10am							
10-12am							
12-2pm							
2-4pm							
4-6pm							
6-8pm							
8-10pm							
10-12pm							
12-2am							
2-4am							
4-8am							

	Mon	Tues	Wed	Thur	Fri	Sat	Sun
6-8am							
8-10am							
10-12am							
12-2pm							
2-4pm							
4-6pm							
6-8pm							
8-10pm							
10-12pm							
12-2am							
2-4am							
4-8am							

ABC Record Chart

Name: Age: Date:

Recorder's name:

Behaviour being recorded:

Antecedents What preceded and/or precipitated the behaviour	
Behaviour Describe in detail the student's actual behaviour.	
Consequences What was the end result? 1. What did you do? - ignore, argue, scold, 2. What did the child do	
Feelings Describe your own feelings during and after the incident.	

Progress Chart

Carer:

Child:

Record your child's progress, on average, towards or away from the targeted behaviour

Target

To.....

Weeks	+10								
	+9								
	+8								
	+7								
	+6								
	+5								
	+4								
	+3								
	+2								
	+1								
		1	2	3	4	5	6	7	8
	-1								
	-2								
	-3								
	-4								
	-5								
	-6								
	-7								
	-8								
	-9								
	-10								

Computers in school and children with Downs syndrome

The importance of using computers is growing for all children. Children with Downs syndrome working in mainstream classrooms or in special provision should have access to tried and tested curriculum software for use in most subject areas.

The 'essential' list gives guidance on the types of software that will be of most value, and should already be available in any well-resourced SEN department. Where they are not available in school they can be accessed through the learning support teams in most areas.

Alongside this a well-resourced SEN department will have access to a scanner and digital camera to personalise work and individualise materials. When schools are planning and allocating budgets, remember that the software is equally as important as the hardware and include the costs of paper for printing and upgrading software as better versions become available. Try to get to at least one education computer exhibition and use the free demonstration software available from most suppliers in order to evaluate new software as it comes on to the market.

Teachers and LSA's will undoubtedly need to use some of their own time to develop their own IT skills, but this is likely to be a very good investment in their own, as well as their children's future.

Although particular pieces of software will run effectively on old computers, children with Down's syndrome and other learning difficulties arguably benefit more from fast multimedia systems than their more able peers.

Essential List

Talking wordprocessor

Pages (SEMERC)

Talk Write (Resource)

Textease (Softease)

Inclusive writer (inclusive technology)

+ Curriculum based clip art

On Screen worksheets

Inclusive writer (inclusive technology)

Clicker (Crick)

Reading support

Wellington Square (SEMERC)

Spelling

Starspell 2000 (Fisher Mariott)

Wordshark (White Space)

Sounds and Rhymes (Xavier)

Gamz2 (inclusive technology)

Memory training

Mastering memory (CALSC)

Numeracy

Numbershark (White Space)

Number tiles (Topologika)

Talking mathsbook (Topologika)

Keyboard Training

First keys (WIDGET)

Type to learn (TAG)

Speedy keys (Semerc)

Useful Addresses of Software Suppliers

Widget Software
26 Queen Street
Cubbington
Leamington Spa
CV32 7NA
Tel: 01926 885303 Fax: 01926 885293
Email: literacy@widgit.com
<http://www.widgit.com>

Semerc
Granada Television
Quay Street
Manchester
M60 9EA
Tel: 0161 827 2927
Semerc.support@gmg.Co.uk

Resource
51 High St,
Kegworth, Derby
DE74 2DA
Tel: 01509 672222 Fax: 01509 672267
Email: info@resourcekt.co.uk

Inclusive Technology
Saddleworth Buisness Centre
Delph, Oldham
OL3 5DF
Tel: 01457 819790 Fax: 01457 819799
Email: inclusive@inclusive.co.uk
www.inclusive.co.uk

Don Johnston
18/19 Clarendon Ct.
Calver Road
Winwick Quay, Warrington
WA2 8QP
01925 256500
info@donjohnston.com
www.donjohnston.com

Topologika software
1 South Harbour Village
Penryn, Cornwall
TR10 8LR
Tel: 01326 377771
Email: sale@topologika.com
www.topologica.co.uk

Sherston Software
Angel House
Sherston
Malmsebury, Wiltshire
SN16 0LH
Tel: 01666 840 433
Email: sales@sherston.co.uk
www.sherston.com

Rickett Educational Media
Great Western House
Langport, Somerset
TA10 9NA
Tel: 01458 254700
Email: info@r-e-m.co.uk
www.r-e-m.co.uk

Down's Syndrome Educational Trust
Sarah Duffen Centre
Belmont Street
Southsea, Hampshire
PO5 1NA
Tel: 02392 824261
Email: sales@downsnet.org
www.downsnet.org

AVP
Sebel Hill Centre
Chepstow
Monmouth
NP6 5PH
Tel: 01291 625439
Email: info@avp.co.uk
www.avp.co.uk

Teaching Resources

Educational Choices for Children with Down Syndrome - video showing how parents make choices of school for their children with Down's syndrome. Produced by Jane Beadman Independent Educational Psychologist, Devon County Council.

An Evaluation of Educational Placement for Children with Down Syndrome - a report on a group of 13 children educated in the local mainstream primary schools which compares their achievements with a group of 9 children in special education. Produced by Jane Beadman Independent Educational Psychologist, Devon County Council.

Numicon Produced by Tony Wing, Snr. Lecturer Maths Education, Brighton University, Romey Tacon, Head Teacher East Sussex, Ruth Atkinson, Maths Coordinator, East Sussex. Available from Numicon Ltd., Unit D, Prospect House, The Hyde Business Park, Bevendean, Brighton BN2 4JE, Tel: 01273 609 991.

Numicon Training Contact Vikki Horner, Grande Havre No.3 North St., Mere, Wiltshire, BA126HH, Tel: 01747 861 609.

Downs Syndrome Educational Trust, Sarah Duffen Centre, Belmont St. Southsea, Portsmouth, Hants. PO5 1NA Tel: 023 9285 5330.

LDA, Duke St., Wisbech, Cambs. PE13 2AE. Tel 01945 463 441, Duke St., Wisbech,

Winslow Press, Telford Rd., Bicester, Oxon, OX6 0TS. Tel: 01869 244 644.

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