About DI

Direct Instruction

GOOD TO GREAT SCHOOLS
AUSTRALIA

Publishing information

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Introduction

Good to Great Schools Australia (GGSA) partners with schools and school systems to support school transformation and improvement along a journey from Poor to Fair, Fair to Good and Good to Great.

For more information on GGSA visit **www.goodtogreatschools.org.au**

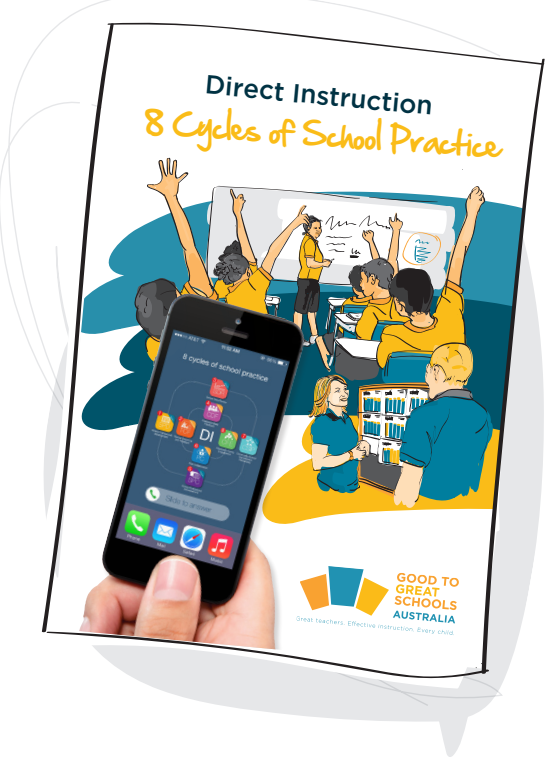
The National Institute for Direct Instruction (NIFDI) are the developers and leading international experts in Direct Instruction (DI) and partner with GGSA to deliver DI in Australian schools.

For more information on NIFDI visit **www.nifdi.org**

This booklet outlines the program components of DI. The technical content was developed by NIFDI who have decades of experience with the program. The technical content on behaviour management and PBIS was gathered from a range of sources.

This document is a companion document to the following:

- Direct Instruction **8 Cycles of School Practice**
- Direct Instruction **Great Teaching Practices Guide**
- Direct Instruction **Professional Development Outline**



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GGSA updates this booklet each year and welcomes all feedback on how it can be improved. Please email feedback to **info@goodtogreatschools.org.au**

Contents

Overview

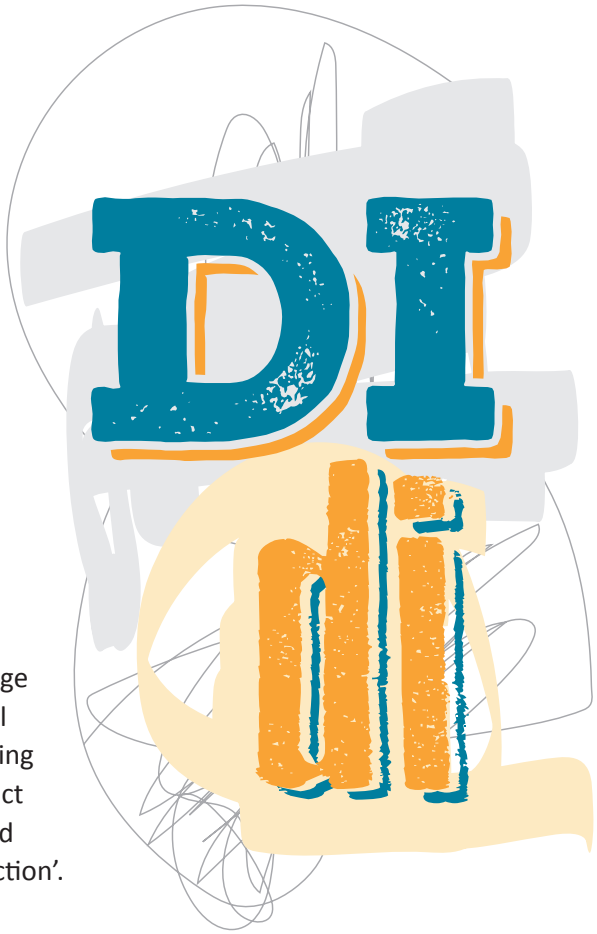
Direct Instruction (DI) is an explicit, carefully sequenced and scripted model of instruction.

The pedagogical principles and practices of DI — and the term Direct Instruction — were developed by Siegfried Engelmann in the early 1960s. Engelmann has continued to develop DI programs with numerous colleagues since then.

Distinguishing upper case DI from lower case di

In a 1976 paper, Barak Rosenshine identified a set of variables significantly related to student achievement. These include engaged time, small group instruction, and specific and immediate feedback. In this paper and subsequent publications, Rosenshine used the term 'direct instruction' to describe this set of variables.

There is an overlap in the pedagogical principles and practices of what have come to be called 'upper case DI' and 'lower case d.i.', but the instructional design that underpins Engelmann's DI includes a comprehensive curriculum which makes Direct Instruction (the program) quite distinct from direct instruction (the pedagogical practices).



Lower case d.i. has now spawned a range of instructional approaches using the terms 'direct instruction' and 'explicit instruction'.

DI programs

There are more than 50 published DI programs which are detailed on the Program Reference Chart.

Each program includes:

- Detailed student and teacher materials for Foundation through Year 8 in reading, language, maths and spelling
- Remedial programs in major instructional areas for Year 3 through Year 12
- Content area programs for intermediate and upper year levels

Most DI programs can be ordered through the McGraw-Hill website.

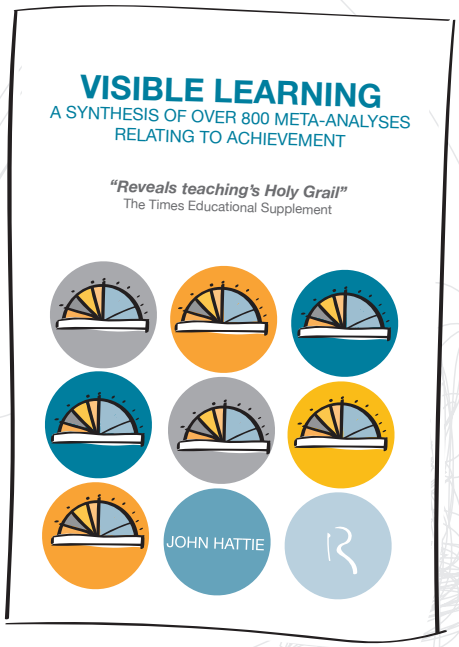
Evidence

John Hattie's *Visible Learning* (2009) is the benchmark reference for 'what works' in education, acknowledged worldwide for the sheer scope and volume of the international evidence synthesised in this landmark study. Visible Learning is the meta-analysis of the meta-analyses of student achievement. It is a synthesis of more than 50,000 studies involving more than 80 million students.

Hattie used **effect size** to assess the relative effectiveness of a range of approaches, interventions and actions on student outcomes.

Hattie determined that the average effect size of student learning over one year of schooling is 0.40. Visible Learning found the effect size of DI was 0.59. This means students doing DI can progress one-and-a-half times faster than an average intervention. DI is therefore one of the most effective interventions of more than 130 covered by Hattie.

'Effect size is a simple way of quantifying the difference between two groups that has many advantages over the use of tests of statistical significance alone. Effect size emphasises the size of the difference rather than confounding this with sample size.'



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2. Rosenshine, B 1976, The psychology of teaching methods, University of Chicago Press, Chicago IL.
3. http://www.goodtogreatschools.org.au/GREAT-TEACHING-PORTAL/DI/DI-Home
4. Hattie, J 2009, Visible Learning: A synthesis of over 800 meta-analyses relating to achievement, Routledge, New York.
5. Coe, R 2002, It's the effect size, stupid: What effect size is and why it is important, http://www.leeds.ac.uk/educol/documents/00002182.htm

Philosophy

The philosophical approach underpinning DI is:

- All students can be taught.
- All students improve academically and their self image also develops.
- All teachers can succeed if provided with adequate training and materials.
- Low performers and disadvantaged learners must be taught at a faster than typical rate if they are to catch up to their higher performing peers.
- All details of instruction must be controlled to minimise the chance of students misinterpreting the information being taught and to maximise the reinforcing effect of instruction.

Instructional design

There are a number of unique features in the Direct Instruction program that contribute to its overall effectiveness. These are covered under the following sections:

- **Instructional design**
- **Mastery**
- **Presentation**
- **Evaluation**
- **Classroom organisation**

Sequence

DI is arranged in carefully crafted sequences built into the lessons.

All DI sequences teach easier skills before harder ones. Teaching sub-skills means that students learn everything they need later, so they can perform operations involving the component sub-skills.

Easily confused items are separated by enough time to reduce the chance of students confusing them.

Example: Names and values of coins, or names and functions of the hands on a clock, are separated by enough lessons that students become very firm on one before dealing with the other.

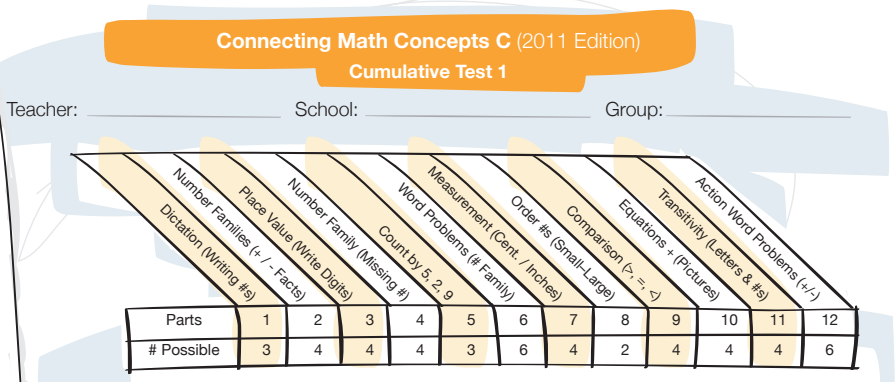
Cumulative review

Each DI program incorporates a cumulative review of all skills and content taught.
Once a skill type is introduced it remains in practice.

First, it is learned in isolation, then practised with repetition schedules (and often combined with other skills as components of higher operations), and then reviewed throughout the level or series.

Daily lessons comprise 10 per cent new information and 90 per cent review of familiar material.

Students encounter the same information lesson to lesson so they can practise and perform successfully and remember the information. Information is thereby transferred from working to long-term memory.



Instructional design

Generalising strategies

Students are explicitly taught strategies that generalise across a broad range of information and situations.

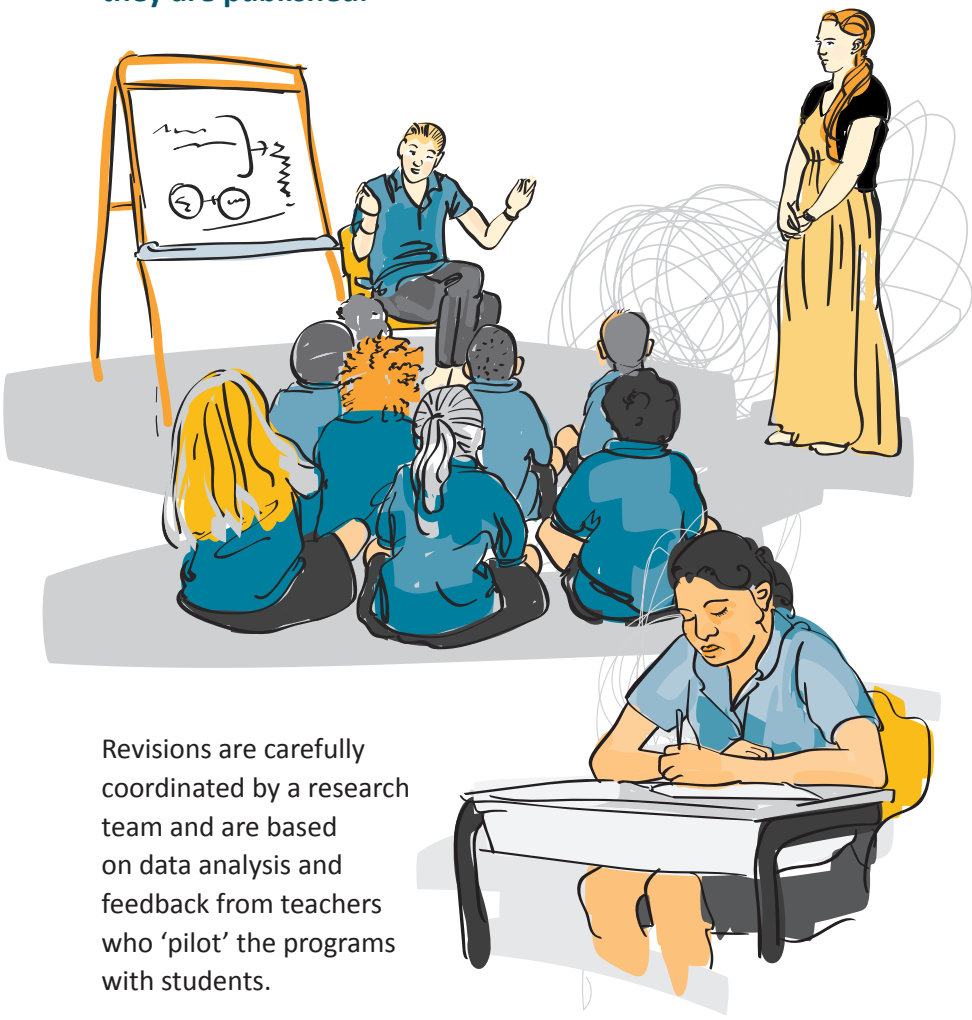
This enables students to:

- Arrive at the correct answers (not just intuit the answers or devise own strategies)
- Receive sufficient practice to internalise the strategies
- Learn they can correct errors if they consistently refer back to the strategy steps

Example: In reading, the students have been taught 16 sounds and the technique of sounding out words Instead of being limited to reading only a few whole words they have memorised, they are now armed with a general strategy they can apply to sound out hundreds of words containing the known sounds.

Field testing

DI programs undergo numerous revisions before they are published.



Revisions are carefully coordinated by a research team and are based on data analysis and feedback from teachers who 'pilot' the programs with students.

Lessons are timed, student errors analysed, and programs are reworked until they are proven to produce 100 per cent mastery for all students.

Field testing also informs the instructional details that form part of the script. This helps create the most efficient and effective road to mastery.

Mastery

Formula

DI is a mastery learning program.

The method for mastery is to:

- Learn new skills in manageable increments
- Practise recently learned information
- Perform applications of mastered skill types

Students acquire information, develop learning strategies and become smarter.

Example: Getting to mastery is like climbing a staircase of steps that are meaningfully sequenced skill increments. Students climb the first step by learning foundation skills. Each step of more difficult skills is performed successfully and students are motivated to keep moving up. Through practice and repetition they reach the top. Students progress at different rates, but all are assured of reaching the top knowing all the key components of the material.

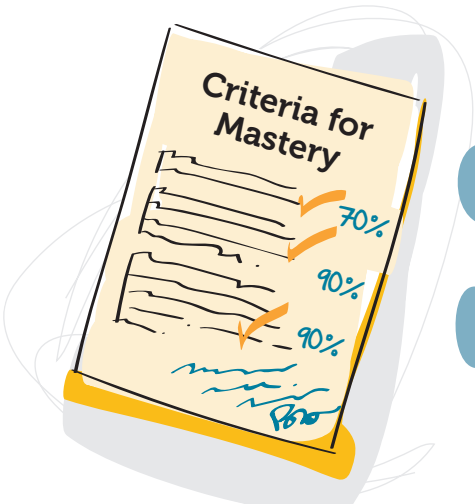
Mastery

Criteria

The criterion used to monitor if students are at mastery is to track their first-time correct performance.

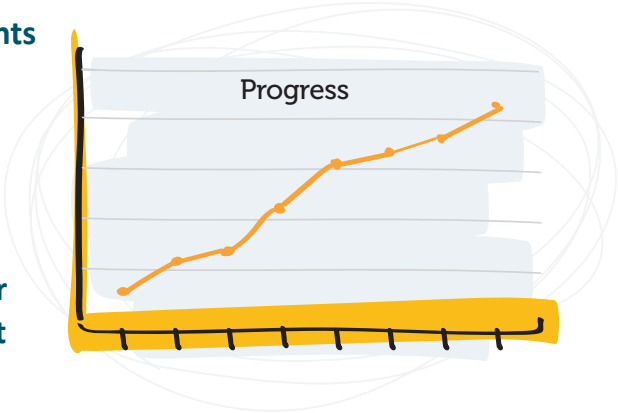
This includes:

- 70 per cent correct or more on the first time they answer a question on anything that is being introduced for the first time
- 90 per cent or more correct on the parts of the lesson that deal with skills and information introduced earlier in the program sequence
- 85 per cent or more first-time correct on independent work
- 100 per cent firm on all tasks and activities presented as individual turns
- 90–100 per cent performance on mastery tests
- Rate of errors low enough that the lesson is complete in the allotted time.



Lesson progress

To provide students with enough opportunity to master skills, a group must complete a sufficient number of lessons in a set period of time.



Lesson progress is not emphasised over mastery, but is an important measure of a group's overall performance.

Each program has a set number of targets that a typical group should complete at mastery.

Lesson progress is monitored by the teacher and support team, who project where students will end up after a marking period and other junctures in the school calendar.

Example: Typical weekly rate of completing reading

Programs	One period of reading instruction per day	Two periods of reading instruction per day
Beginning levels	High: 6–7 Medium: 5 Low: 3–4	High: 8–9 Medium: 7–8 Low: 5–7
Upper levels (varies with lesson complexity)	A student should complete (or come as close to completion as possible) one lesson per 90-minute period at mastery (except Direct Instruction Spoken English (DISE), which contains lessons that are designed to be repeated several times).	

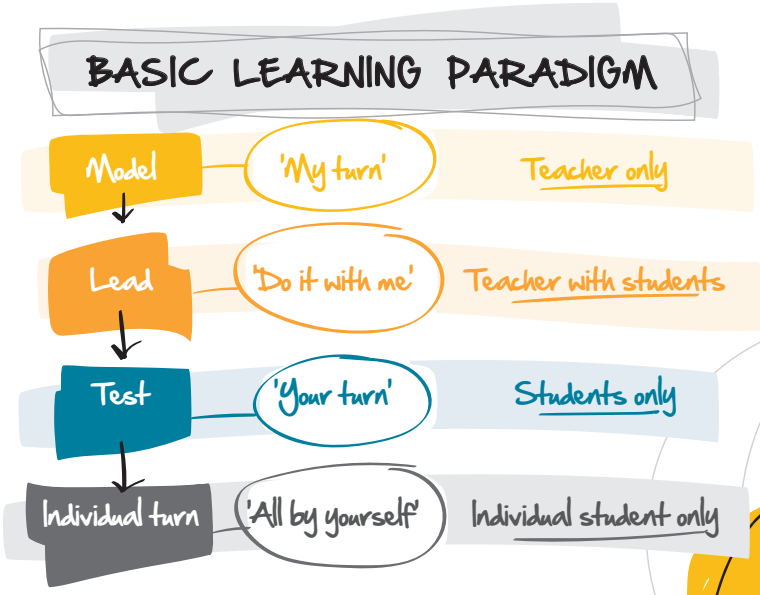
Presentation

Learning paradigm

At the heart of all oral and written exercises is the learning paradigm of model, lead, test and individual turn.

The method the teacher uses is to:

- State a learning objective
- Introduce new material to a group
- Provide guided practice and feedback



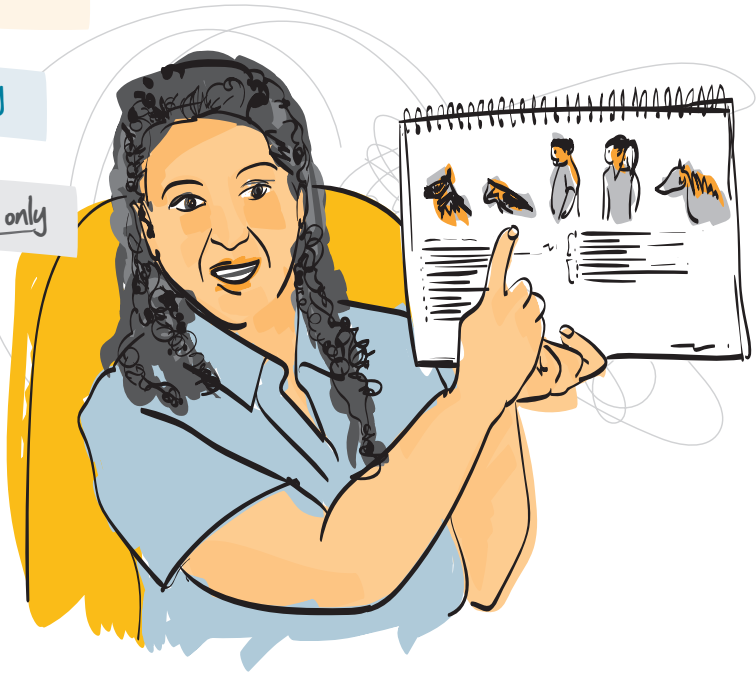
Script

Each program contains a script for each lesson that specifies everything the student and teacher are to say and do.

Scripts are organised into teaching steps that are repeated in consecutive lessons.

Formats change over time to reduce the structure provided for students and lead to independent application of skills.

The teacher follows the script so that every unit is taught in a logical, sequenced way with no crucial elements missed.



Presentation

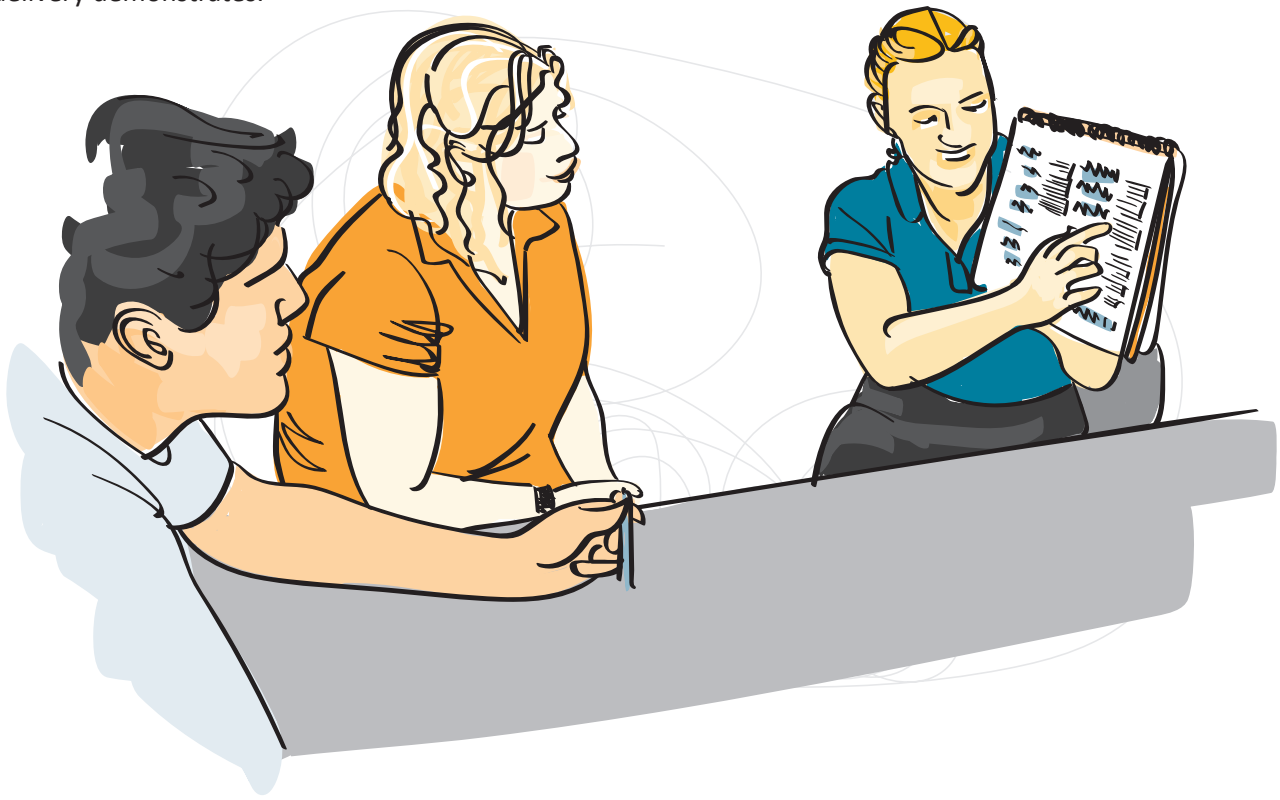
Script delivery

Scripts enable the teacher to concentrate on using their professional decision-making to manage student responses and behaviour.

The teacher's wording is consistent so students comprehend and the teacher can focus on engaging with students and maximising learning opportunities.

The teacher regularly practices the script to master the instructional details and perfect their delivery. The more teachers practise delivering lessons the greater expertise, creativity and showmanship their delivery demonstrates.

Example: Compare a piece of music performed by a virtuoso to a novice violinist. Clearly, the virtuoso has had many more years to practise, become confident and built their professional knowledge. Likewise, Shakespeare delivered by a new actor is considerably different to Shakespeare delivered by a veteran.



Presentation

Unison responses

To maximise student engagement, the teacher instructs all the students to answer a question or follow a direction in unison.

The purpose is to:

- Enable every student the opportunity to respond and practise
- Ensure the teacher can evaluate student performance and determine what has been learnt and if each student learnt it

Signs that indicate to the teacher that a student has not learnt include:

- students not answering
- making errors
- coming in too soon or too late
- mumbling, or
- looking to other students to help them.

Presentation

Signal

The teacher uses a signal when they want the students to respond in unison so the students know it is their turn to answer.

The scripted lesson specifies which signal the teacher is to use and when they should use it. They are either:

- **Visual**, like a hand drop, or a point and touch of a whiteboard
- **Audible**, like a hand clap, snap or tap of the desk

Example: The role of the teacher using signals is similar to a conductor leading an orchestra. The conductor uses their hands or a baton to send 'signals' to the orchestra, who then respond as they make their way through the music. When the conductor 'signals' and the orchestra plays (responds), the conductor can assess if someone is off-key, coming in too soon, or too late.

Presentation

Pacing

When the teacher delivers lessons in a brisk pace they present more material and move students further.

The purpose is to:

- Teach more material
- Maintain student engagement
- Reduce memory load
- Progressively enable students who are behind to catch up in learning

Quick transitions help students remember information just presented, and how new learning relates to previous steps.

Presentation

Motivation and reinforcement

All programs have built-in mechanisms that challenge students, provide feedback about their successes and specify rewards.

Most programs contain a motivational point system, and some have older students complete individual point charts and assume responsibility for computing their own grades.

At the start of a DI lesson, the teacher articulates how students can meet the expectations. Then throughout the lesson, the teacher motivates students with constant reinforcement of what is going right.

Example: The Teacher/Student Game enables students to visualise their success. Correct responses are quickly translated into student points until they 'beat' the teacher. Students quickly come to love their lessons because they are virtually always successful and win the game. Students learn that when they work hard, remember information and demonstrate good work habits, they are rewarded.

Evaluation

Lesson performance

DI scripts require the teacher to 'repeat until firm'. If a student makes an error, the teacher corrects or 'firms' them on what was difficult until every student in the group can perform all tasks.

Only after students can perform within the acceptable criteria do they move on to the next exercise.

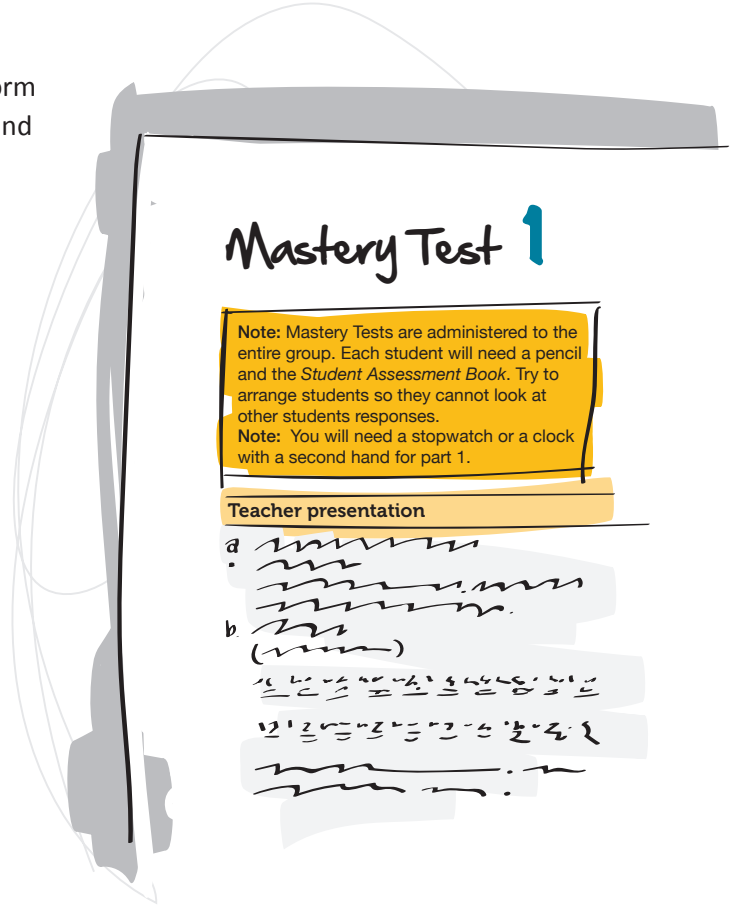
Once a whole group can perform a regular exercise accurately and fluently, the teacher presents individual turns.

By this point, individual students show off their new skills and demonstrate tasks with 100 per cent accuracy.

Measure

Mastery is regularly evaluated at three junctures:

- Exercise-by-exercise during lessons
- Day-to-day at the completion of entire lessons
- At five- or 10-lesson intervals using mastery tests and reading checkouts built into the programs



Evaluation

Independent work

Daily independent work is a key indicator of mastery. Independent work at every year level is checked by the teacher and/or students, corrected where necessary and then recorded by the teacher.

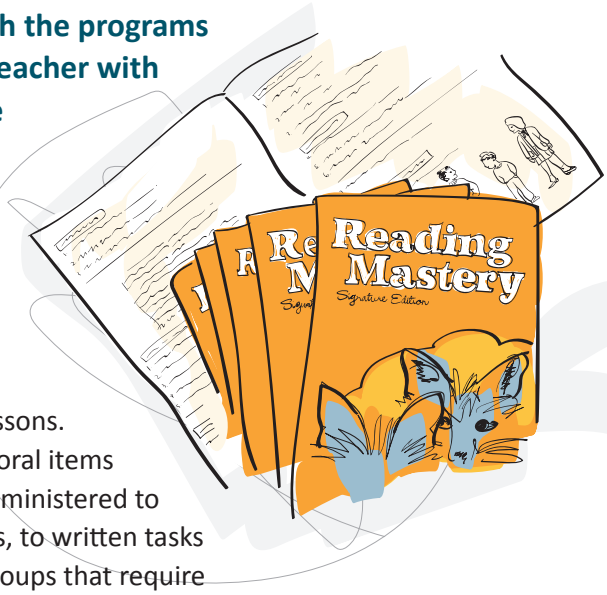
Only after students can perform within the acceptable criteria do they move on to the next exercise.

The teacher can build in additional incentives and reward students when they perform higher than the required rate of accuracy (85 per cent correct).

Independent work is also called 'take-home work'. This means the student can take the worksheet home once it is checked by the teacher to share their progress with their family.

Tests

Program tests measure student progress through the programs to provide the teacher with feedback on the effectiveness of their teaching.



Most reading programs have built-in mastery tests or checkouts every five or 10 lessons. These range from oral items that are quickly administered to individual students, to written tasks administered to groups that require an entire class period.

Most language and maths programs test students on material taught in the prior 10 lessons. In maths, there are separate cumulative tests that occur halfway through the program (usually after lesson 60) and at the end.

Evaluation

Work-check sessions

Work-check sessions are teacher-directed and last 10 to 15 minutes.

The purpose is to:

- Hold students accountable for high quality work so they learn that accuracy and effort are important
- Provide additional opportunity for students to learn the lesson
- Enable students to learn from their mistakes and errors so they do not become patterns

Students in upper levels of programs correct their own work at the end of lessons. Students use red pens to mark items correct or incorrect. Students correct any mistakes as soon as possible before the next lesson.

Evaluation

Remedies and retests

A remedy is triggered when one or more students do not meet the criterion of at least 90 per cent in a mastery test.

Identifying and addressing problems early avoids student errors being a source of failure in more complex activities later on when they are harder to reverse.

The schedule for presenting remedies is determined by how many students had difficulty on a mastery test.

The teacher presents exercises from previous lessons specifically targeted to firm weaknesses in performing critical skills. Once remedies are completed, students are retested.

Example: If only a few students failed items, the teacher might proceed to subsequent lessons and then follow the lesson with remedies for the few, while the rest of the class completes an independent assignment. If a quarter or more of a group failed items, the teacher presents the remedies to the entire class and re-administers the mastery test.

Remedy Table – Mastery Test 1

Part	Test items	Remedy		Remedies Worksheet
		Lesson	Exercise	
1	Addition and Subtraction Facts	3	3	Part A
		4	1	Part B
		5	1	Part C
2	Number Families (Missing Number)	3	1	–
		4	4	Part D
		5	4	Part E
3	Comparison Sentences (More/Less)	7	2	Part F
		8	2	Part G
4	Expanded Notaion	1	7	Part H
		2	4	Part I
		3	7	Part J
5	Count-by Problems	6	6	Part K
		7	7	Part L
		8	7	Part M

Evaluation

Weekly data review

Data is based on mastery data collected from independent work, mastery tests and checkouts.

Data guides the school instruction team to make decisions about; reteaching a specific skill strand, repeating a segment of a lesson, accelerating a group, or regrouping students.

Each teacher completes written records, summarises student performance and submits the data.

The school instruction team meet each week to review the data of all groups and set actions for each teacher based on the data.

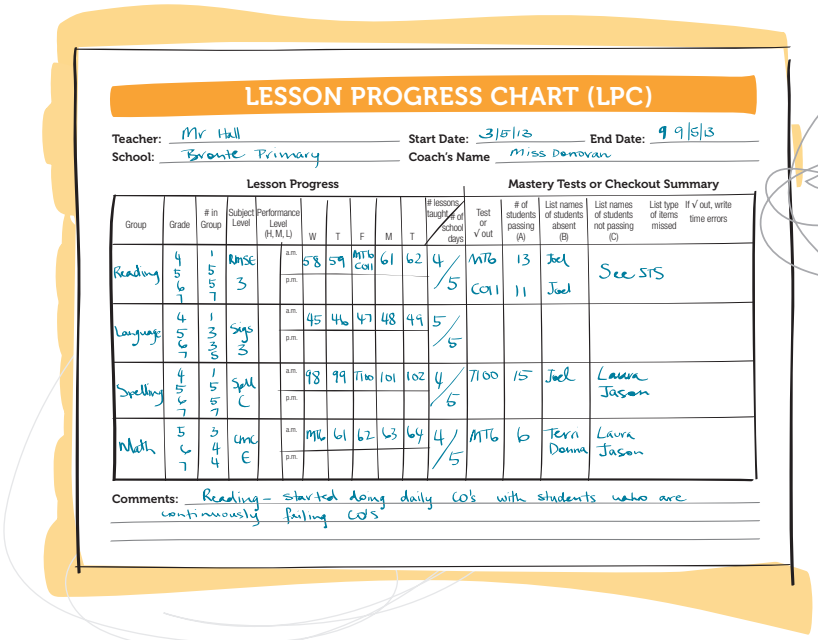
The teacher then receives the feedback.

Visible learning

At the end of each lesson, the teacher maps work-check session scores on the classroom display boards that display students' progress.

Students who complete independent work at or above 90 per cent accuracy are taught how to translate their scores onto the chart.

To celebrate student success, the teacher plans treats and special activities to occur at benchmarks labelled on the chart.



LESSON PROGRESS CHART (LPC)

Teacher: Mr Hall
School: Bronte Primary
Start Date: 3/5/13
Coach's Name: Miss Donovan
End Date: 9/5/13

Lesson Progress														Mastery Tests or Checkout Summary				
Group	Grade	# in Group	Subject Level	Performance Level (H, M, L)		W	T	F	M	T	# lessons taught / # of school days	Test or √ out	# of students passing (A)	List names of students absent (B)	List names of students not passing (C)	List type of items missed	If √ out, write time errors
Reading	4 5 6 7	1 5 5 7	RMSE 3		a.m.	58	59	MT6 Co11	61	62	4/5	MT6	13	Joel	See STS		
					p.m.							Co11	11	Joel			
Language	4 5 6 7	1 2 3 5	Sngs 3		a.m.	45	46	47	48	49	5/5						
					p.m.												
Spelling	4 5 6 7	1 5 5 7	Spell C		a.m.	98	99	T100	101	102	4/5	T100	15	Joel	Laura Jason		
					p.m.												
Math	5 6 7	3 4 4	Unit E		a.m.	MT6	61	62	63	64	4/5	MT6	6	Terri Donna	Laura Jason		
					p.m.												

Comments: Reading – started doing daily CO's with students who are continuously failing CO's

Classroom Organisation

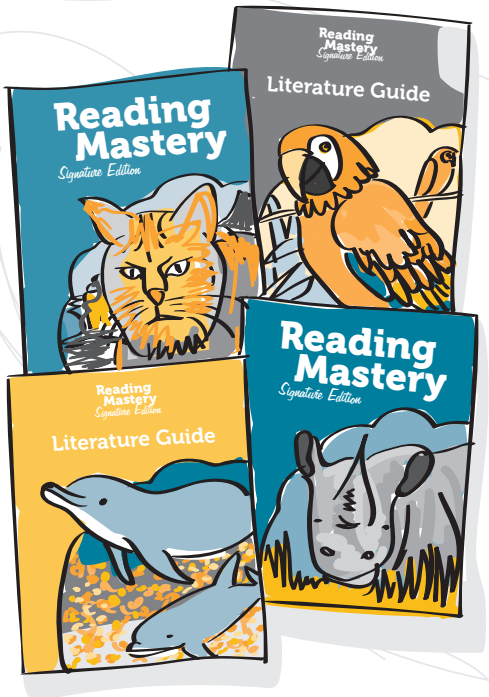
Timetable

DI is scheduled in the school timetable with the following requirements:

- School-wide with flexible grouping across classrooms and year levels
- Adequate time for teaching each subject as per guidelines
- Groups distributed throughout the day rather than morning only
- A second reading period for groups that need it
- Lessons beginning on time and taught for the duration of each period
- Assemblies, excursions and other school activity do not disrupt DI lessons

SAMPLE TIMETABLE Year 2

Session	Time	Teacher
Morning	8:00–8:15	Opening routines
	8:15–9:45	**Reading**: RMSE Reading 2
	9:45–10:00	Recess
	10:00–11:00	**Language**: RMSE Language 2
	11:00–12:00	Maths
Afternoon	12:00–12:30	Lunch
	12:30–1:30	Science/Social Studies/HPE
	1:30–2:30	**Reading**: Most of another RMSE Language 2 lesson
	2:30–2:45	Clean-up and dismissal



Classroom Organisation

Student assessment and grouping

All students are placement tested before being assigned to an instructional group to ensure they are neither bored (placed too low) nor overwhelmed (placed too high).

During the school year a student can stay in the same group or be moved to a different group dependent on their performance on independent work, mastery tests and checkouts.

Regrouping occurs more frequently in the lower levels of programs with younger students. Groups tend to be more stable in the upper levels.

Homogeneous groups

DI is always taught in homogeneous groups. Students with similar skills and learning rates are grouped together as much as possible.

The teacher efficiently brings all students to mastery by reducing the ratio of interactions needed to 'firm' weaker students or challenge capable students.

Young students, students in lower levels and older remedial students are instructed in small groups of 12 or fewer to maximise monitoring and individual attention.

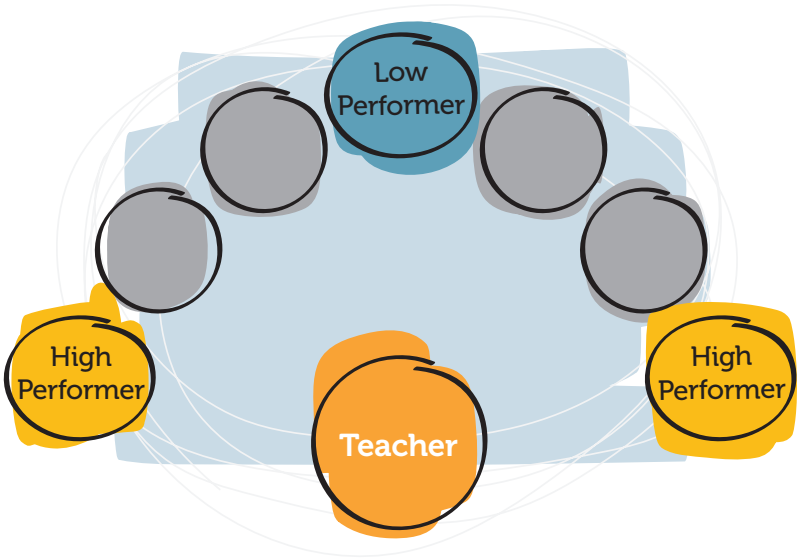
Older students and those in upper levels are instructed in groups of 15 to 20 or more students.

Classroom Organisation

Classroom arrangement

Small group instruction seating

Small group instruction is in a semicircle of closely spaced chairs around the teacher. Students are close enough to view the Presentation Book, and teachers can interact with students through physical prompts and congratulatory gestures.

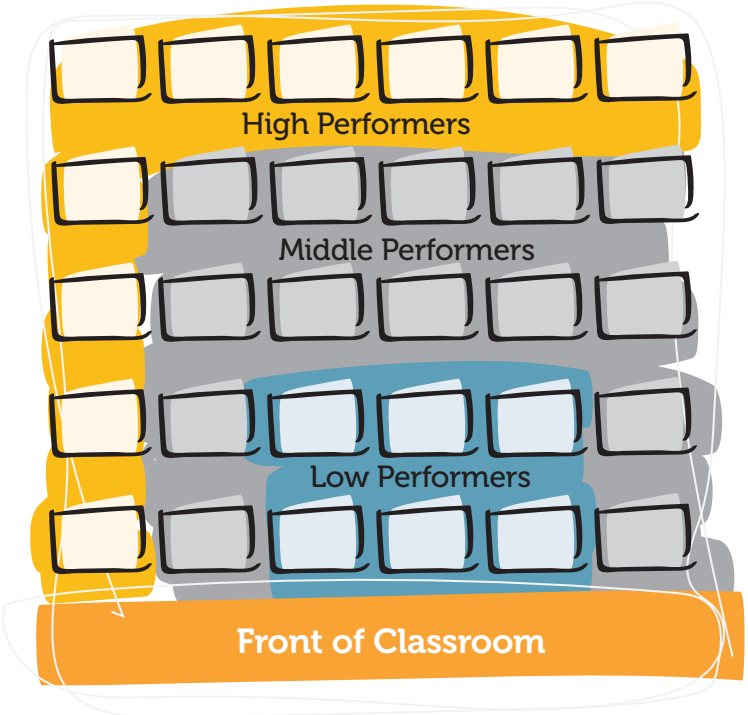


Low performers (LP) are seated toward the centre to allow the teacher to best monitor their responses and hold their attention.

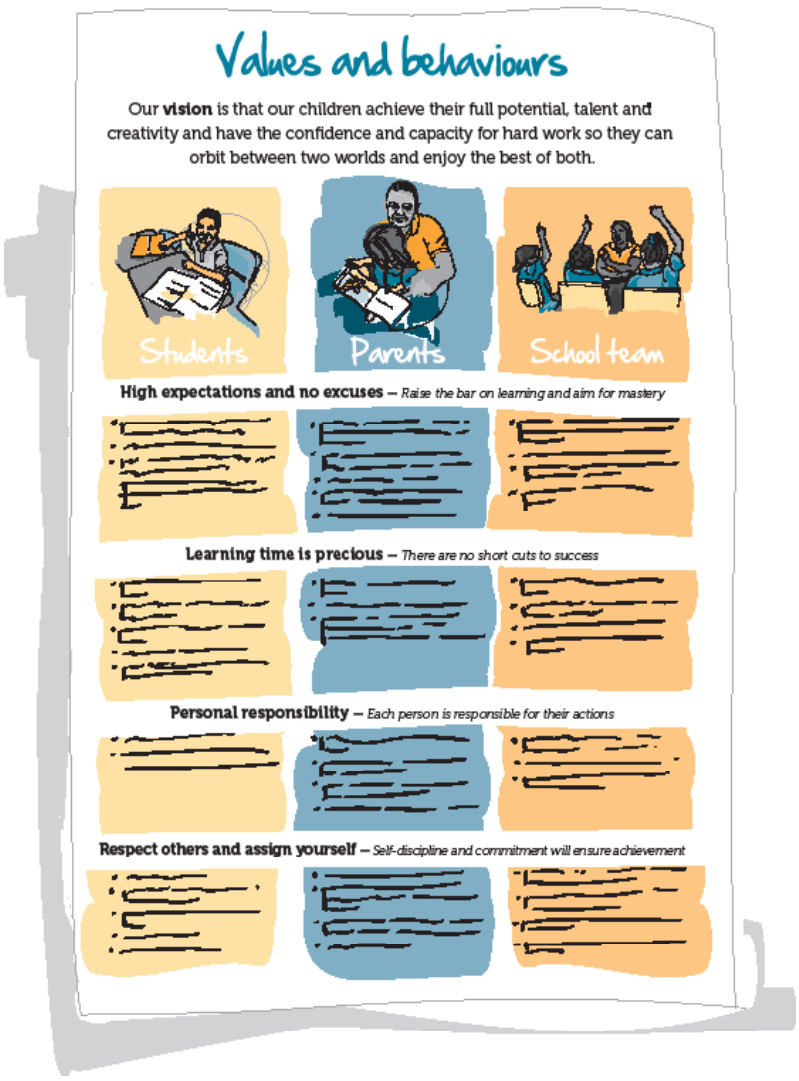
Large group instruction seating

Large group instruction is rows and columns of chairs and desks facing forward. The teacher can walk around and monitor students while delivering.

Low performers are seated closest to the teacher to allow close monitoring and feedback. High performers (HP) are seated in areas where the teacher is less able to frequently monitor oral and written responses.



Overview



The DI program has embedded behaviour management features within its design to maximise student engagement and ensure learning is efficient and effective.

GGSA also includes a specific behaviour management approach into its DI implementations. The method used is school-wide on Positive Behavioural Interventions and Support (PBIS).

This method has been customised to enhance the delivery of DI to maximise student outcomes. It enables a school to create a positive culture that supports all students to achieve academic and social success.

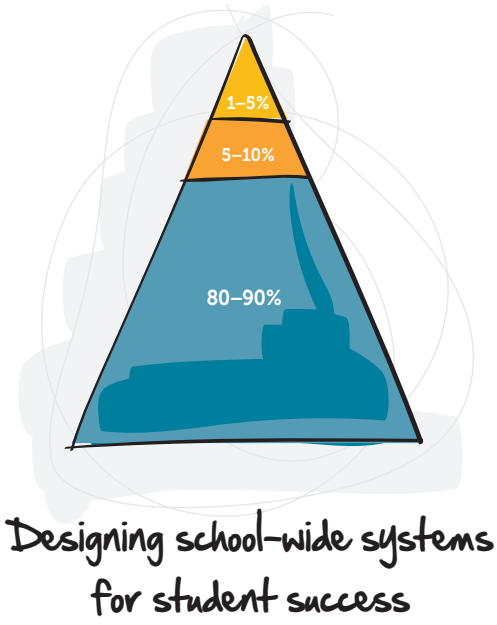
The two areas of focus are:

- Student behaviour in the classroom to maximise student engagement and learning
- Student behaviour and discipline school-wide to ensure cohesion across the school community

Evidence and philosophy

PBIS was developed in the 1990s and is used in over 13,000 schools across Australia, the United States, New Zealand and Canada.

Studies show that when schools implement the program with fidelity, they can achieve up to a 50 per cent reduction in discipline referrals, increased time for teaching, improved school climate and higher teacher and student satisfaction[6].



The philosophical approach underpinning embedded DI behaviour management is:

- All students can learn to meet all behavioural expectations
- Behavioural expectations are systematically taught with the same fidelity as academic skills
- School team collaborates to enact a common approach to discipline across all school settings
- A continuum of strategies encourage appropriate behaviour and discourage inappropriate behaviour
- Strategies have empirical evidence of their effectiveness, efficiency, relevance and durability
- Problem behaviours are addressed as they emerge so they do not worsen or spread across students
- Intense support is provided for those who need it with behaviour support plans
- School-based procedures ensure ongoing monitoring and evaluation
- School, families and the community have a shared commitment to resolve behavioural issues

6. Sawka-Miller, K., & Miller, D. (2007). The third pillar: linking positive psychology and school-wide positive behavior support. School Psychology Forum: Research in Practice 2(1).

Malloy, J. M., & Hawkins, M. O. (Eds.). (2010). Positive behavioral interventions and supports and dropout prevention (Monograph). Clemson, SC: Clemson University, National Dropout Prevention Center.

Program components

Behaviour Management Plan

A Behaviour Management Plan articulates the school rules, expectations and consequences.

The purpose is to:

- Ensure students conduct themselves appropriately in every classroom and across the school
- Commit teachers, students and parents to the school's rules and enforcement procedures

It is developed with input from the school team, students and their families, to ensure maximum cohesion of school culture and performance.

Routines and expectations

Routines and expectations are systematically taught according to the school's Behaviour Management Plan.

The purpose is to:

- Familiarise students with how and when they are to manage particular routines
- Maximise instruction and decrease repeat directions
- Establish an orderly tone and make the classroom a pleasant place for students to learn

Program components

Rewards, corrections and sanctions

Routines and expectations are fairly and consistently enforced using a set of predictable, multi-tiered consequences known as rewards, corrections and sanctions.

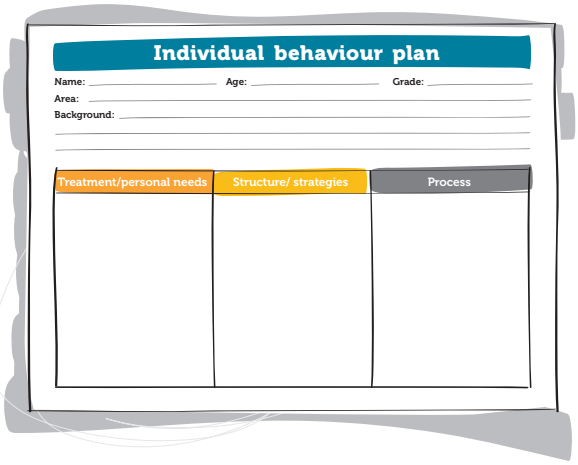
The purpose is to:

- Reward students for appropriate behaviour
- Build correction procedures for misbehaviour
- Clarify sanctions for misbehaviour
- Describe behaviours that will lead to suspension and expulsion

These are articulated at a classroom and school level by the school team through conversations and displays.

Program components

Individualised strategies

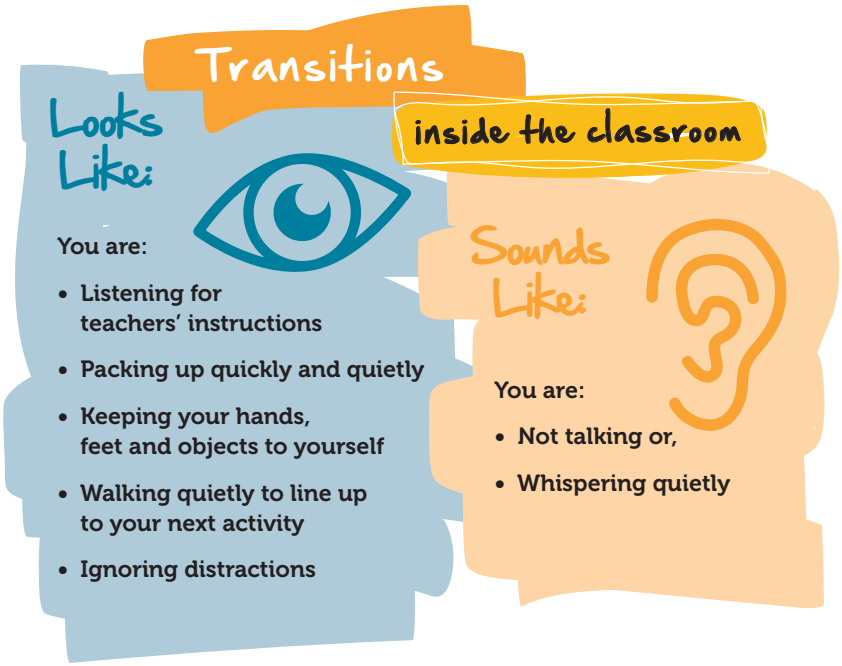


Individualised strategies are used as proactive and preventive management to increase student appropriate behaviours or replace inappropriate behaviours.

The purpose is to:

- Shape teaching tactics through individual praise
- Use individualised reward systems
- Teach social skills and reteaching procedures and routines

These are developed by the teacher with assistance from the Behaviour Management Team.



Intensive support

Intensive support is provided to remediate and change the behaviour of students who are exhibiting chronic and significant misbehaviours.

The purpose is to:

- Develop function based interventions to identify motivating factors or functions of the student's behaviour along with its antecedents and consequences
- Develop structured, individualised programs to teach expected behaviours, recognise and reward good behaviour, and administer consequences for misbehaviour

Parents are involved in the process and are supported to learn how to help their child develop pro-social attitudes and skills.

Program components

Patterns of behaviour

When the behaviour management framework is applied in a school a pattern of student behaviour generally emerges.

For mainstream schools:

- Around 80 per cent of students are able to be taught appropriate behaviour that is reinforced and maintained by the school team with school-wide and classroom strategies
- Around 15 per cent of students will require additional support from the school team through individualised strategies
- Around five per cent of students will require intensive support from the school team through an individual plan

For disadvantaged schools:

Schools with a high percentage of students from disadvantaged backgrounds are more likely to have a higher percentage of students needing individualised strategies and intensive support.

This is because these students are more likely to:

- Have the preconditions for special needs
- Have undiagnosed or untreated conditions
- Display chronic and significant misbehaviours

Regular review of behaviour data

Behaviour data is collated and regularly reviewed in various forums by the school instruction team, parents and the broader school community.

The purpose is to:

- Always have an accurate picture of behaviour across the school
- Ensure appropriate action is being taken to address behaviour
- Ensure behaviour issues are always declining across the school

Conclusion

Taken together Positive Behavioural Intervention Supports (PBIS) and Direction Instruction (DI) have a transformative effect on schools if they are properly implemented.

Schools now have an effective curriculum from which all students can learn, use teaching methods that reach all students, and employ management practices that reinforce positive behaviour among all students. Put together, these practices ensure that teachers will be effective instructionally and students will learn successfully.

By helping schools implement these powerful practices with a high level of quality, Good to Great Schools Australia (GGSA) supports school transformation and improvement along a journey from Poor to Fair, Fair to Good and Good to Great.